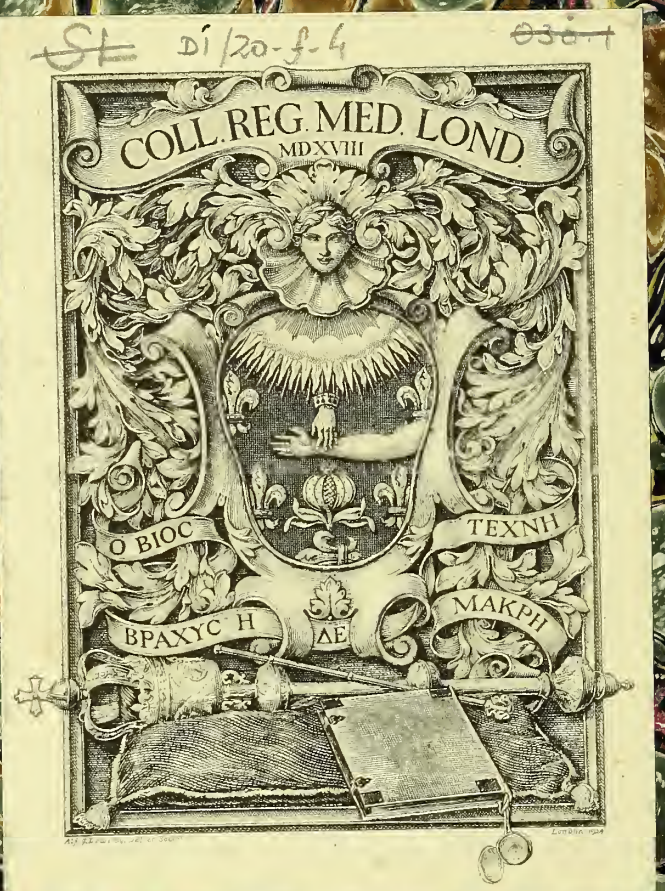

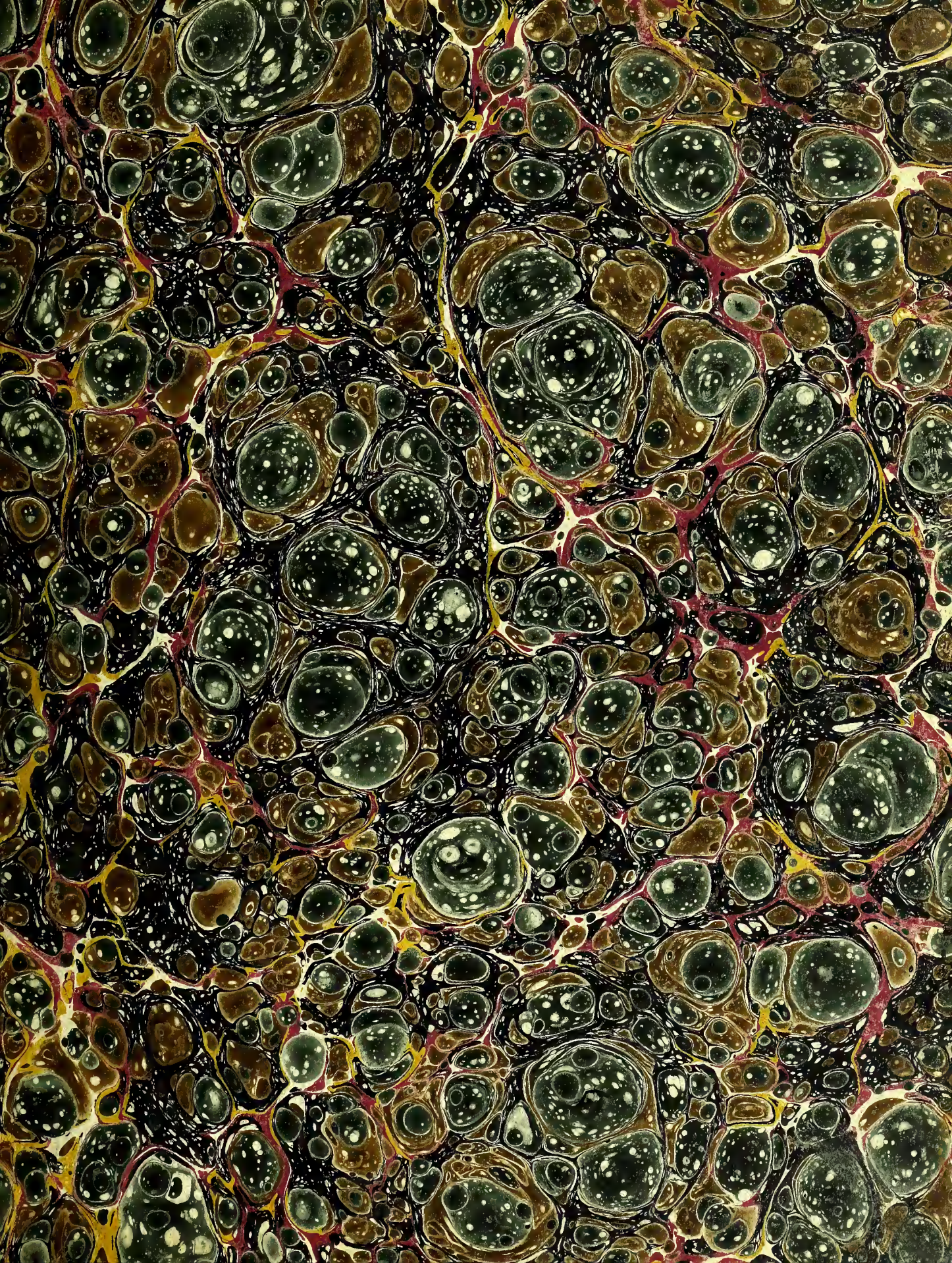

THE

# CYCLOPÆDIA;

OR,

## Universal Dictionary

OF

## ARTS, SCIENCES, AND LITERATURE.

VOL. XXV.

Printed by A. Strahan,
New-Street-Square, London.

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BY

ABRAHAM REES, D.D. F.R.S. F.L.S. *S. Amer. Soc.*

WITH THE ASSISTANCE OF

EMINENT PROFESSIONAL GENTLEMEN.



ILLUSTRATED WITH NUMEROUS ENGRAVINGS,

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IN THIRTY-NINE VOLUMES.

VOL. XXV.

*LONDON:*

PRINTED FOR LONGMAN, HURST, REES, ORME, & BROWN, PATERNOSTER-ROW,

F.C. AND J. RIVINGTON, A. STRAHAN, PAYNE AND FOSS, SCATCHERD AND LETTERMAN, J. CUTHELL, CLARKE AND SONS, LACKINGTON HUGHES HARDING MAVOR AND JONES, J. AND A. ARCH, CADELL AND DAVIES, S. BAGSTER, J. MAWMAN, JAMES BLACK AND SON, BLACK KINGSBURY PARBURY AND ALLEN, R. SCHOLEY, J. BOOTH, J. BOOKER, SUTTABY EVANCE AND FOX, BALDWIN CRADOCK AND JOY, SHERWOOD NEELY AND JONES, R. SAUNDERS, HURST ROBINSON AND CO., J. DICKINSON, J. PATERSON, E. WHITESIDE, WILSON AND SONS, AND BRODIE AND DOWDING.

1819.

# *CYCLOPÆDIA:*

OR, A NEW

# UNIVERSAL DICTIONARY

OF

# ARTS and SCIENCES.

## NEWTONIAN PHILOSOPHY.

NEWTONIAN PHILOSOPHY, the doctrine of the univerſe, and, particularly, of the heavenly bodies; their laws, affections, &c. as delivered by ſir Iſaac Newton.

The term Newtonian philoſophy is applied very differently; whence have ſprung divers confuſed notions relating to it.

Some authors, under this philoſophy, include the whole corpuſcular philoſophy conſidered as it now ſtands corrected and reformed by the diſcoveries and improvements made in ſeveral parts of it by ſir Iſaac Newton, in which ſenſe it is that s'Graveſande calls his Elements of Phyſics, "Introductio ad Philoſophiam Newtonianam." And in this ſenſe the Newtonian is the ſame with the new philoſophy, and ſtands contradiſtinguiſhed to the Carteſian, the Peripatetic, and the ancient corpuſcular.

Others, by Newtonian philoſophy, mean the method or order which ſir Iſaac Newton obſerves in philoſophizing, *viz.* the reaſoning and drawing of concluſions directly from phenomena, excluſive of all previous hypotheſes; the beginning from ſimple principles; deducing the firſt powers and laws of nature from a few ſelect phenomena, and then applying thoſe laws, &c. to account for other things. (See *Law of* NATURE.) And, in this ſenſe, the Newtonian philoſophy is the ſame with the experimental philoſophy; and ſtands oppoſed to the ancient corpuſcular.

Others, by Newtonian philoſophy, mean that in which phyſical bodies are conſidered mathematically, and by which geometry and mechanics are applied to the ſolution of phenomena. In which ſenſe, the Newtonian is the ſame with the mechanical and mathematical philoſophy.

Others, again, by Newtonian philoſophy, underſtand that part of phyſical knowledge which ſir Iſaac Newton has handled, improved, and demonſtrated, in his Principia.

Others, laſtly, by Newtonian philoſophy, mean the new principles which ſir Iſaac Newton has brought into philoſophy; the new ſyſtem founded on them; and the new ſolutions of phenomena thence deduced; or that which characteriſes and diſtinguiſhes his philoſophy from all others; which is the ſenſe in which we ſhall chiefly conſider it.

As to the hiſtory of this philoſophy, we have but little to ſay: it was firſt made public in the year 1686, by the author, then a fellow of Trinity college, Cambridge; and in the year 1713 republiſhed, with conſiderable improvements. Several other authors have ſince attempted to make it plainer; by ſetting aſide many of the more ſublime mathematical reſearches, and ſubſtituting either more obvious reaſoning, or experiments, in lieu of them; particularly Whiſton, in his Prælect. Phyſ. Mathemat.; s'Graveſande, in Element. et Inſtit.; and Dr. Pemberton, in his View; and Maclaurin, in his excellent work, intitled "An Account of ſir Iſaac Newton's Philoſophical Diſcoveries."

Notwithſtanding the great merit of this philoſophy, and the univerſal reception it has met with at home, it gained ground at its firſt publication but ſlowly abroad; Newtonianiſm had ſcarcely two or three adherents in a nation; but Carteſianiſm, Huygenianiſm, and Leibnitzianiſm, maintained their ground, till the force of truth prevailed. And it is now held in the utmoſt veneration both at home and abroad.

The philoſophy itſelf is laid down principally in the third book of the Principia. The two preceding books are taken up in preparing the way for it, and laying down ſuch principles of mathematics as have the neareſt relation to philoſophy: ſuch are the laws and conditions of powers. And theſe, to render them leſs dry and geometrical, the author illuſtrates by ſcholia in philoſophy, relating chiefly to the denſity and reſiſtance of bodies, the motion of light and ſounds, a vacuum, &c.



Strahan and Preſton,
New-Street Square, London.

In the third book he proceeds to the philoſophy itſelf; and from the ſame principles deduces the ſtructure of the univerſe, and the powers of gravity, by which bodies tend towards the ſun and planets; and from theſe powers, the motions of planets, and comets, the theory of the moon, and the tides.

This book, which he calls "De Mundi Syſtemate," he tells us was firſt written in the popular way; but conſidering, that ſuch as are unacquainted with the ſaid principles would not conceive the force of the conſequences, nor be induced to lay aſide their ancient prejudices; for this reaſon, and to prevent the thing from being in continual diſpute, he afterwards digeſted the ſum of that book into propoſitions, in the mathematical manner; ſo as it might only come to be read by ſuch as had firſt conſidered the principles; not that it is neceſſary a man ſhould maſter them all; many of them, even the firſt rate mathematicians would find a difficulty in getting over. It is enough to have read the definitions, laws of motion, and the three firſt ſections of the firſt book: after which the author himſelf directs us to paſs on to the book "De Syſtemate Mundi."

The ſeveral articles of this philoſophy are delivered under their reſpective heads; as SUN, MOON, PLANET, COMET, EARTH, AIR, CENTRAL, CENTRIFUGAL, and CENTRIPETAL *Force*, RESISTANCE, MEDIUM, MATTER, SPACE, ELASTICITY, GRAVITY, &c. A general idea, or abſtract of the whole, we ſhall here lay before the reader, to ſhew in what relation the ſeveral parts ſtand to each other.

The great principle on which the whole philoſophy is founded, is the power of gravity. This principle is not new: Kepler, long ago, hinted it in his "Introduct. ad Mot. Martis." He even diſcovered ſome of the properties of it, and their effects in the primary planets; but the glory of bringing it to a phyſical demonſtration was reſerved to the Engliſh philoſopher. See GRAVITY.

His proof of the principle from phenomena, together with the application of the ſame principle to the various other appearances of nature, or the deducing thoſe appearances from that principle, conſtitute the Newtonian ſyſtem; which, drawn in miniature, will ſtand thus:

I. The phenomena are, 1. That the ſatellites of Jupiter do, by radii drawn to the centre of the planet, deſcribe areas proportionable to their time; and that their periodical times are in a ſeſquiplicate ratio of their diſtances from its centre; in which the obſervations of all aſtronomers agree. 2. The ſame phenomenon holds of the ſatellites of Saturn with regard to Saturn; and of the moon with regard to the earth. (See MOON.) 3. The periodical times of the primary planets about the ſun are in a ſeſquiplicate ratio of their mean diſtances from the ſun. But, 4. The primary planets do not deſcribe areas any way proportional to their periodical times about the earth; as being ſometimes ſeen ſtationary, and ſometimes retrograde with regard to it.

II. 1. The powers by which the ſatellites of Jupiter are conſtantly drawn out of their rectilinear courſe, and retained in their orbits, do reſpect the centre of Jupiter, and are reciprocally as the ſquares of their diſtances from the ſame centre. 2. The ſame holds of the ſatellites of Saturn with regard to Saturn; of the moon with regard to the earth, and of the primary planets with regard to the ſun.

III. The moon gravitates towards the earth, and by the power of that gravity is retained in her orbit; and the ſame holds of the other ſatellites with reſpect to their primary planets; and of the primaries with reſpect to the ſun. See GRAVITY and MOON.

As to the other ſecondary planets, their phenomena, with reſpect to their primary ones, being of the ſame kind with thoſe of the moon about the earth, it is argued by analogy, that they depend on the ſame cauſes; it being a rule or axiom in which all philoſophers agree; that effects of the ſame kind have the ſame cauſes. Again, attraction is always mutual, *i. e.* the re-action is equal to the action: conſequently, the primary planets gravitate towards their ſecondary ones; the earth towards the moon, and the ſun towards them all. And this gravity, with regard to each ſeparate planet, is reciprocally as the ſquare of its diſtance from its centre of gravity.

IV. All bodies gravitate towards all the planets; and their weights towards any one planet, at equal diſtances from the centre of the planet, are proportional to the quantity of matter in each.

For the law of the deſcent of heavy bodies towards the earth, ſetting aſide their unequal retardation from the reſiſtance of the air, is this, that all bodies fall equally in equal times; but the nature of gravity or weight, no doubt, is the ſame on the other planets as on the earth. Suppoſe, *e. gr.* ſuch bodies raiſed to the ſurface of the moon, and together with the moon, deprived at once of all progreſſive motion, and dropped towards the earth; it is ſhewn, that in equal times they would deſcribe equal ſpaces with the moon; and, therefore, that their quantity of mattter is to that of the moon, as their weights to its weight. Add, that ſince Jupiter's ſatellites revolve in times that are in a ſeſquiplicate ratio of their diſtances from the centre of Jupiter, and conſequently at equal diſtances from Jupiter, their accelerating gravities are equal; therefore, falling equal altitudes in equal times, they will deſcribe equal ſpaces, juſt as heavy bodies do on our earth. And the ſame argument will hold of the primary planets with regard to the ſun. And the powers by which unequal bodies are equally accelerated are as the bodies, *i. e.* the weights are as the quantities of matter in the planets. And the weights of the primary and ſecondary planets towards the ſun are as the quantities of matter in the planets and ſatellites. And hence are ſeveral corollaries drawn relating to the weights of bodies on the ſurface of the earth, magnetiſm, and the exiſtence of a vacuum; which ſee under VACUUM, WEIGHT, and MAGNETISM.

V. Gravity extends itſelf towards all bodies, and is in proportion to the quantity of matter in each.

That all the planets gravitate towards each other has been already ſhewn; likewiſe, that the gravity towards any one, conſidered apart, is reciprocally as the ſquare of its diſtance from the centre of the planet; conſequently, gravity is proportional to the matter in them. Farther, as all the parts of any planet, A, gravitate towards another planet, B; and the gravity of any part is to the gravity of the whole, as the matter of the part to the matter of the whole; and re-action equal to action; the planet B will gravitate towards all the parts of the planet A; and its gravity towards any part will be to its gravity towards the whole, as the matter of the part to the matter of the whole.

Hence we derive methods of finding and comparing the gravities of bodies towards different planets; of finding the quantities of matter in the ſeveral planets, and their denſities; ſince the weights of equal bodies revolving about planets are as the diameters of their orbits, directly; and as the ſquares of the periodical times, inverſely; and the weights at any diſtance from the centre of the planet are greater or leſs in a duplicate ratio of their diſtances, inverſely; and ſince the quantities of matter in the planets are as their powers at equal diſtances from their centres; and, laſtly, ſince the weights

weights of equal and homogeneous bodies towards homogeneous ſpheres are, at the ſurface of the ſpheres, as the diameters of thoſe ſpheres; and conſequently, the denſities of heterogeneous bodies are as the weights at the diſtances of the diameters of the ſpheres.

VI. The common centre of gravity of the ſun, and all the planets, is at reſt; and the ſun, though always in motion, yet never recedes far from the common centre of all the planets.

For the matter in the ſun being to that in Jupiter as 1033 to 1; and Jupiter's diſtance from the ſun to the ſemidiameter of the ſun in a ratio ſomewhat bigger; the common centre of gravity of Jupiter and the ſun will be found a point a little without the ſun's ſurface. And, by the ſame means, the common centre of Saturn and the ſun will be found a point a little within the ſun's ſurface; and the common centre of the ſun, and all the planets, will be ſcarcely one diameter of the ſun diſtant from its centre. But the centre is always at reſt; therefore, though the ſun will have a motion this and that way, according to the various ſituations of the planets, yet it can never recede far from the centre. So that the common centre of gravity of the earth, ſun, and planets, may be eſteemed the centre of the whole world.

VII. The planets move in ellipſes that have their foci in the centre of the ſun, and deſcribe areas proportional to their times.

This we have already laid down *à poſteriori*, as a phenomenon; and now, that the principle of the heavenly motions is ſhewn, we deduce it from them *à priori*. Thus, ſince the weights of the planets towards the ſun are reciprocally as the ſquares of the diſtances from the centre of the ſun; if the ſun were at reſt, and the other planets did not act on each other, their orbits would be elliptical, having the ſun in their common umbilicus, and they would deſcribe areas proportional to the times; but the mutual actions of the planets are very ſmall, and may be well thrown aſide. Therefore, &c.

Indeed, the action of Jupiter on Saturn is of ſome conſequence; and hence, according to the different ſituations and diſtances of thoſe two planets, their orbits will be a little diſturbed.

The ſun's orbit too is ſenſibly diſturbed by the action of the moon; and the common centre of the two deſcribes an ellipſis round the ſun placed in the umbilicus; and with a radius drawn to the centre of the ſun, deſcribes areas proportional to the times.

VIII. The aphelia and nodes of the planets are at reſt; excepting for ſome inconſiderable irregularities ariſing from the actions of the revolving planets and comets. Conſequently, as the fixed ſtars retain their poſition to the aphelia and nodes, they too are at reſt.

IX. The axis, or polar diameter, of the planets is leſs than the equatorial diameter.

The planets, if they had no diurnal rotation, would be ſpheres, as having an equal gravity on every ſide; but, by this rotation, the parts receding from the axis endeavour to riſe towards the equator, which, if the matter of which they conſiſt be fluid, will be affected very ſenſibly. Accordingly Jupiter, whoſe denſity is found not much to exceed that of water on our globe, is obſerved by the aſtronomers to be conſiderably leſs between the poles, than from eaſt to weſt. And on the ſame principle, unleſs our earth were higher at the equator than towards the poles, the ſea would riſe under the equator, and overflow all near it.

But this figure of the earth ſir Iſaac Newton proves likewiſe *à poſteriori*; from the oſcillations of pendulums being ſlower and ſmaller in the equatorial than the polar parts of the globe.

X. All the moon's motions, and all the inequalities in thoſe motions, follow from theſe principles: *e. gr.* her unequal velocity, and that of her nodes, and apogee in the ſyzygies and quadratures; the differences in her eccentricity, and her variation, &c. See MOON, QUADRATURE, SYZYGY, &c.

XI. From the inequalities in the lunar motions, we can deduce the ſeveral inequalities in the motions of the ſatellites.

XII. From theſe principles, particularly the action of the ſun and moon upon the earth, it follows, that we muſt have tides; or that the ſea muſt ſwell and ſubſide twice every day. See TIDE.

XIII. Hence likewiſe follow the whole theory of comets; as, that they are above the region of the moon, and in the planetary ſpaces; that they ſhine by the ſun's light reflected upon them; that they move in conic ſections, whoſe umbilici are in the centre of the ſun; and by radii drawn to the ſun, deſcribe areas proportional to the times; that their orbits, or trajectories, are very nearly parabolas; that their bodies are ſolid, compact, &c. like thoſe of the planets, and muſt therefore acquire an immenſe heat in their perihelia; that their tails are exhalations ariſing from them, and encompaſſing them like atmoſpheres. See COMET.

The objections raiſed againſt this philoſophy are chiefly aimed at the principle, gravity; which ſome condemn as an *occult quality*; and others as a *miraculous* and preternatural cauſe; neither of which have any longer room in ſound philoſophy. Others, again, ſet it aſide, as deſtroying the notion of vortices; and others, as ſuppoſing a vacuum. But theſe are all abundantly obviated under GRAVITY, ATTRACTION, VORTEX, VACUUM, and QUALITY.

NEWTOWN, in *Geography*, a ſmall borough-town in the pariſh of Calbourne, and north-weſt half hundred of Weſt-Medina liberty, in the Iſle of Wight, and county of Southampton, England, is ſituated on a ſmall river, to which it gives name, on the north-weſt extremity of the iſland. It was anciently called Francheville, and occurs under that appellation in its original charter, granted by Aymer, biſhop of Wincheſter, and ſubſequently confirmed by Edward II., Edward IV., and queen Elizabeth. At preſent it is only a very trifling place, but the numerous traces of ſtreets, ſtill diſtinctly viſible, ſufficiently indicate its former extent and importance. Many ſmall burgage lands lie on each ſide of the old ſtreets; and in ſome old writings, the names both of High-ſtreet and Gold-ſtreet are frequently mentioned. But though much decayed, Newtown continues to be governed by a mayor and twelve burgeſſes, as a corporate borough, by preſcription. Two members are ſent from hence to ſerve in parliament; a privilege which this town firſt enjoyed in the 27th year of queen Elizabeth. Theſe are elected in the town-hall; the elective franchiſe being veſted in the mayor and burgeſſes holding borough lands, as determined by a committee of the houſe of commons in 1729. The haven of Newtown affords the beſt ſecurity for ſhipping of any about the iſland; and, at high water, is capable of floating veſſels above 500 tons burden. "The water and fiſhery is claimed by the mayor and burgeſſes. They hold a court-leet, and appoint conſtables; but pay a rent to the lord of the manor of Swainſton." Worſley's Hiſtory of the Iſle of Wight. Beauties of England and Wales, by E. W. Brayley, and J. Britton, F.S.A., vol. vi.

NEWTOWN, a market-town in the hundred of Newtown, and county of Montgomery, North Wales, is ſituated on

the ſouth bank of the river Severn, at the diſtance of nine miles ſouth-weſt from Montgomery, and 176 north-weſt from London. It is a pleaſant place; but moſt of the buildings being partly erected with timber, gives it rather an appearance of meanneſs. The market here is held on Tueſday every week, and there are five well-attended fairs annually. The ancient name of this place was Llan-Fair-Ynhedewain, or St. Mary, in the cantref of Cydewain; the increaſe of houſes and population having given origin to its preſent appellation. The woollen trade is carried on here, and in the vicinity, to a conſiderable extent, and many perſons are ſtill employed in the various proceſſes; though it muſt be confeſſed that the number of theſe has been much reduced of late, by the introduction of machinery. Flannel is the chief article of produce, and is ſupplied in every degree of fineneſs. In the church, which is an ancient edifice, not remarkable for its architecture, is an altar-piece painted by Dyer the poet, and an antique font and ſcreen, both of which are ſaid to have been brought from the abbey of Cwmhir, in Radnorſhire. The petty-ſeſſions for the upper diviſion of the hundred are held in this town, which appears to have more than doubled its population ſince 1801. According to the parliamentary returns of that year, the whole pariſh contained only 203 houſes, and 990 inhabitants; but by the late returns (1811), the former are eſtimated at 438, and the latter at 2025 in number. Such are the effects of an increaſing trade, which has no doubt been conſiderably promoted by the canal navigation opened between this town and the Grand Trunk, by means of the Montgomeryſhire canal.

Adjoining to the town ſtands Newtown-Hall, a ſeat of the Prices, of the royal tribe of Elyſtan Glodrydd. The late owner, ſir John Price, was extremely eccentric. He married three wives, and kept the firſt two after their demiſe in an embalmed ſtate, placing them in his chamber, one on each ſide of his bed. The third wife, however, with a becoming ſpirit, refuſed the knight the honour of her hand, till he had removed the defunct rivals, and committed them to a proper place of interment. Caerſws, a ſmall village about five miles weſt from Newtown, is ſuppoſed to have been a Roman ſtation, though not enumerated in any of the Itineraries, as the fields around bear evident traces of ancient ſtreets; and ſome hewn ſtones and bricks, ſuch as the Romans uſed in the conſtruction of their cities, are frequently diſcovered. On the north and weſt ſides there yet remain deep hollows, which, from their arrangement, are conjectured to be portions of the foſſa or ditch, once ſurrounding the precinct of the ſtation. Two encampments are placed in the immediate vicinity; and at the diſtance of a mile is a third, of very large dimenſions, and peculiar conſtruction; all of them undoubtedly Roman. On the ſouth ſide of the laſt is an immenſe mount of a conical ſhape, ſurrounded by a very wide and deep foſſe. The uſe of this appendage cannot well be aſcertained, unleſs it may be conſidered as having been the ſcite of an exploratory tower. At the northern end of the foſſe is an oblong area, varying conſiderably in breadth, and defended on all ſides by a lofty vallum, which conſtitutes the ſcarp ſide of a deep ditch. This leads, at one extremity, by a porta, or entrance way, into a rectangular camp; and at the other is connected, in a ſimilar manner, with the conical mount. The whole is encircled by a large outer rampart and foſſe, ſo that it muſt have been a poſition of very great ſtrength; a circumſtance inferring a more than ordinary degree of importance.

North-eaſt from Newtown, to the weſt of the road leading to Montgomery, ſtand the ruins of Dulforwyn caſtle. This fortreſs occupied the ſummit of a mountainous ridge, exceedingly precipitous, and nearly ſurrounded by a woody dingle. It was built, according to Dugdale, by David ap Llewellyn, a prince who reigned from the year 1240 to 1246; but the works of John Dafydd Rhys aſſign to it a much earlier date, ſtating it to have been erected by Bleddyn ap Cynfyn, ſome time between the years 1065 and 1073. In 1278 it was granted, by Edward I., to Roger de Mortimer, along with the caſtles of Kedewen and Keri, to be held *in capite*, by the ſervice of three knights' fees. The origin of the name of this place, which ſignifies "the meadows of the maiden," has been a ſubject of much curious inquiry among antiquaries. Pennant conſiders it having an alluſion to the legendary ſtory of Sabrina, related by Jeffrey of Monmouth, and ſo finely deſcribed by Milton in his Maſk of Comus. Rowland's Mona Antiqua, 4to. Beauties of England and Wales, vol. xvii. by the Rev. J. Evans.

NEWTOWN *of Ayr*. See AYR *Newtown*.

NEWTOWN, a poſt-town of America, in Fairfield county, Connecticut, pleaſantly ſituated on an elevated ſpot, and ſettled in 1708; 80 miles N.E. of New York.—Alſo, a town on Staten iſland, New York; 9 miles S.W. of New York.—Alſo, a townſhip in Queen's county, New York, including all the iſlands in the Sound oppoſite to the ſame, and containing 2312 inhabitants, of whom 512 are ſlaves; about 8 miles E. of New York.—Alſo, a townſhip in Weſt Cheſter county, New York, of whoſe inhabitants 276 are electors.—Alſo, a poſt-town in Tioga county, New York, ſituated between the ſouth end of Seneca lake and Tioga river, taken from Chemung coaſt on the eaſt, and incorporated in 1792; containing 1333 inhabitants.—Alſo, a townſhip in Glouceſter county, New Jerſey.—Alſo, a poſt-town and ſeat of juſtice in Suſſex county, New Jerſey, about 10 miles S.E. of Sandyſton. It contains a large Preſbyterian church, a ſtone court-houſe, and gaol. The manufacture of iron is carried on in a furnace and four forges. Here is a remarkable cave called the Devil's hole, and in its vicinity are ſeveral ponds, covering from 5 to 100 acres; 108 miles N.E. of Philadelphia.—Alſo, a poſt-town and capital of Bucks county, Pennſylvania; containing a Preſbyterian church, a ſtone gaol, a court-houſe, an academy, and about 40 houſes; ſettled in 1725; 10 miles W. of Trenton.—Two other townſhips of this name are ſituated, the one in Delaware county, the other in that of Cumberland, having 1427 inhabitants.—Alſo, a ſmall town of Virginia, ſituated in Frederick county, between the north and ſouth branches of Shenandoah river; 7 miles S. of Winchеſter.

NEWTOWN *Ardes*, a poſt-town of the county of Down, Ireland, pleaſantly ſituated on the northern extremity of Strangford lough. It was incorporated by James I., and, before the union, ſent two members to the houſe of commons. It is 88 miles N. by E. from Dublin, and 8 E. from Belfaſt.

NEWTOWN *Barry*, a ſmall town or village of the county of Wexford, Ireland. It is ſituated on the river Slaney, on the confines of the county of Carlow, and is ſaid to be one of the prettieſt villages in Ireland. Its fairs are much frequented. It is 48 miles S. by W. from Dublin, and 12 N. by W. from Enniſcorthy.

NEWTOWN *Breda*, a village of the county of Down, Ireland, remarkable for the beauty of its church, which attracts the attention of all travellers. It is 3¼ miles S.S.E. from Belfaſt, and 20 N.W. from Downpatrick.

NEWTOWN *Glens*, a poſt-town of the county of Antrim, Ireland, ſituated on Caſhendal or Red bay, in the North Channel.

Channel. It is 109 miles N. by E. from Dublin, and 29 miles N. by E. from Belfaſt.

NEWTOWN *Hamilton*, a poſt-town of the county of Armagh, Ireland, in the diſtrict of the Fews Mountains; 53 miles N. by W. from Dublin, and 12½ miles N. by W. from Dundalk.

NEWTOWN *Limavaddy*, a poſt and market-town of the county of Londonderry, Ireland, which, before the union, was repreſented in parliament. It is ſituated upon the river Roe, and has a good linen market. It is 106 miles N. by W. from Dublin, and 10 miles W. from Coleraine.

NEWTOWN *Mount Kennedy*, a poſt-town of the county of Wicklow, Ireland, adjoining which is the fine ſeat of lord Roſſmore. It is 17 miles S. by E. from Dublin.

NEWTOWN *Stewart*, a poſt-town of the county of Tyrone, Ireland, ſituated on the river Moyle. Near this is Baron's Court, a fine ſeat of the marquis of Abercorn. It is 93 miles N.N.W. from Dublin, and 8 miles S.E. from Strabane.

NEWTYA, a town of Hindooſtan, in Concan; 40 miles N.N.W. of Goa.—Alſo, a town of Hindooſtan, in Bengal; 30 miles E. of Rangpour.

NEW VINEYARD, a town in Kennebeck county, Maine, weſt of Kennebeck river, between Anſon and Strong; 40 miles N.W. of Auguſta.

NEW UTRECHT, a ſmall maritime town of New York, in King's county, Long iſland, oppoſite to the Narrows; 7 miles S. of New York city, and containing 778 inhabitants.

NEW WERKT, a ſmall iſland in the German ſea, at the mouth of the Elbe, near the coaſt of Bremen; 7 miles W. of Cuxhaven.

NEW WINDSOR, a townſhip of Orange county, New York, pleaſantly ſituated on the weſt branch of Hudſon river; 3 miles S of Newburgh, and containing 2001 inhabitants. The townſhip is famous for a ſcythe manufacture. Its compact part contains about 40 houſes, and a Preſbyterian church; 64 miles N. of New York.

NEW WORK ISLAND, a ſmall iſland near the north-eaſt coaſt of Newfoundland. N. lat. 49° 55'. W. long. 54° 30'.

NEW YEAR'S HARBOUR, a good harbour on the north coaſt of Staten Land iſland, diſcovered Jan. 1, 1775, whence its name, and affording wood and good water. S. lat. 54° 50'. W. long. 64° 25'.

NEW YEAR'S *Iſlands*, a group of ſmall iſlands in the South Pacific ocean, on the north coaſt of Staten Land. Captain Cook landed on the moſt eaſterly on the 31ſt of December 1774, and killed a great number of ſeals and birds. Theſe iſlands, ſays captain Cook, are in general ſo unlike Staten Land, eſpecially that on which we landed, that it deſerves a particular deſcription. It ſhews a ſurface of equal height, and elevated about 30 or 40 feet above the ſea, from which it is defended by a rocky coaſt. The inner part of the iſle is covered with a ſort of ſward-graſs, very green, and of a great length. It grows on little hillocks of two or three feet in diameter, and as many or more in height, in large tufts, which ſeemed to be compoſed of the roots of the plant matted together. Among theſe hillocks are a vaſt number of paths, made by ſea-bears and penguins, by which they retire into the centre of the iſle. It is nevertheleſs exceedingly bad travelling; for theſe paths are ſo dirty, that one is ſometimes up to one's knees in mire. Beſides this plant, there are ſome few other graſſes, a kind of heath, and ſome celery. The whole ſurface is moiſt and wet, and on the coaſt are ſeveral ſmall ſtreams of water. The animals found on this little ſpot are ſea-lions, ſea-bears, a variety of oceanic and ſome land-birds. The ſea-lions are not of that kind deſcribed under the ſame name by lord Anſon; but for aught I know, theſe would more properly deſerve that appellation; the long hair with which the back of the head, the neck, and ſhoulders are covered, giving them greatly the air and appearance of a lion. The other part of the body is covered with ſhort hair, little longer than that of a cow or a horſe; and the whole is of a dark brown. The female is not half ſo big as the male, and is covered with a ſhort hair of an aſh or light dun colour. They live, as it were, in herds, on the rocks, and near the ſea-ſhore. As this was the time for engendering, as well as bringing forth their young, we have ſeen a male with 20 or 30 females about him, and always very attentive to keep them all to himſelf, and beating off every other male who attempted to come into his flock. The ſea-bears are not ſo large by far as the lions, but are rather larger than the common ſeal. They have none of that long hair which diſtinguiſhes the lion: theirs is all of an equal length, and finer than that of the lion, ſomewhat like an otter's; and the general colour is that of an iron-grey. This is the kind which the French call ſea-wolves, and the Engliſh ſeals: they are, however, different from the ſeals in Europe and North America. The lions may too, without any great impropriety, be called overgrown ſeals; for they are all of the ſame ſpecies. S. lat. 54° 41'. W. long. 64° 28'. Cook's Second Voyage, vol. ii. chap. 4.

NEW YORK *State*, *County*, *City*, &c. See *New* York.

NEXAPA, or *St. Yago de Nexapa*, a town of Mexico, in the province of Guaxaca; 50 miles E. S. E. of Guaxaca. N. lat. 17° 19'. W. long. 97° 46'.—Alſo, a town of Mexico, in the province of Guatimala; 10 miles S.E. of St. Salvador. N. lat. 13° 56'. W. long. 90°.

NEXELOE, a ſmall iſland of Denmark, near the W. coaſt of Laaland. N. lat. 35° 47'. E. long. 11° 19'.

NEXI, among the Romans, perſons free-born, who, for debt, were delivered bound to their creditor, and obliged to ſerve him, till they could pay the debt.

NEXOE, in *Geography*, a ſea-port town of Denmark, on the E. coaſt of the iſland of Bornholm, with a harbour for ſmall ſhips.

NEXON, a town of France, in the department of the Upper Vienne, and chief place of a canton, in the diſtrict of St. Yriuix; 15 miles S.S.W. of Limoges. The place contains 1781, and the canton 8426 inhabitants, on a territory of 207½ kiliometres, in nine communes.

NEXPA, a town of Mexico, in the province of Guaſteca; 60 miles S.S.W. of Panuco.

NEXT TAKER, among *Miners*, is he that hath the next meer in poſſeſſion.

NEXUS *of Matter*. See COHESION.

NEYBA, in *Geography*, a town of Portugal, in the province of Entre Duero e Minho, which runs into the ſea, five miles S. of Viena.

NEYBA, or *Neiva*, a fertile plain on the S. ſide of the iſland of St. Domingo, bounded E. by the bay and river of its name, on the W. by the river of Dames and the pond of Henriquelle; containing about 80 ſquare leagues, and abounding with game, flamingoes, pheaſants, and royal or crowned peacocks. Nine leagues from the weſt bank of the river is the town, containing about 200 houſes, and able to furniſh 200 men capable of bearing arms. The territory produces a ſort of plaiſter, talc, and foſſil ſalt. The river might be rendered navigable for ſmall craft, and the place might afford eligible ſituations for 150 ſugar plantations.

NEYBA, or *Neyva*, a town of South America, and

capital of a diſtrict in New Granada, on the Madalena; 120 miles N.E. of Popayan. N. lat. 3° 10'. W. long. 74° 16'.

NEYDORF, a town of Auſtria; ſeven miles W.N.W. of Falkenſtein.

NEYER, a diſtrict or circar of Hindooſtan, between the fandy deſerts of Cutch and the river Puddar, about 70 miles long and 20 broad.

NEYERN, a town of Bohemia, in the circle of Pilſen; 35 miles S.S.W. of Pilſen. N. lat. 49° 16'. E. long. 13° 2'.

NEYKIRCHEN, a town of Auſtria; ſix miles S.W. of Neuſtatt.

NEYLEAU, a town of Germany, in the principality of Culmbach; eight miles W. of Hof.

NEYMARCK, a town of Auſtria; ſix miles S. of Ips.

NEYMARKT, a town of Auſtria; ſix miles W. of Efferding.

NEYSTADT, a town of Auſtria; eight miles W. of Ips.

NEZ *de Iſbourg*, a cape on the W. coaſt of France, in the Engliſh channel, about a league S. of cape Anderville. N. lat. 49° 40'.

NEZ *de Querqueville*, a cape on the W. coaſt of France, in the Engliſh channel; three miles N.W. of Cherbourg.

NEZENHEIM, a town of Germany, in the county of Limburg; five miles S.E. of Markt Einerſheim.

NEZIN, a town of Ruſſia, in the government of Tchernigov, conſiderable for its fur trade; 28 miles S.E. of Tchernigov N. lat. 50° 3'. E. long. 31° 52'.

NEZITZA, a river of Ruſſia, in the government of Archangel, which runs into the Frozen ocean; 28 miles S. of Ponoi.

NEZLET *el Gindi*, a town of Egypt, on the right bank of the Nile; ſeven miles N. of Atfieh.

NGAN-CHAN, a city of China, of the firſt rank, in the province of Koei-tcheou; ſituated in a mountainous territory, and containing ſeveral ſubordinate cities with garriſoned forts for keeping in awe the independent inhabitants of the mountains. The vallies and plains are well watered, and need only induſtry to render them productive. N. lat. 26° 12'. E. long. 15 32'.

NGAN-KING, a city of China, of the firſt rank, in the province of Kiang-nan, and capital of the weſtern part of the province; delightfully ſituated, and governed by a particular viceroy, who keeps a large garriſon in a fort built on the banks of the river Yang-tſe-kiang. The commerce and riches of this country render it very conſiderable, and every thing that is conveyed from the ſouthern part of China to Nan-king muſt paſs through it. The whole country belonging to it is level, pleaſant, and fertile. Under its juriſdiction are ſix cities of the third claſs. N. lat. 30° 37'. E. long. 116° 14'.

NGAN-LO, a city of China, of the firſt rank, in the province of Hou-quang, which is commercial and rich. In its diſtrict are two towns of the ſecond order, and five of the third. N. lat. 31° 14'. E. long. 111° 24'.

NGAN-PIN-TCHING, a ſmall iſland in the Chineſe ſea, near the W. coaſt of Formoſa. N. lat. 23°. E. long. 119° 34'.

NGUIANQUE, a town of Africa, in the kingdom of Hoval; and ſometimes called the capital.

NHAMDIA, in *Ichthyology*, the name of a fiſh caught in rivers of many parts of America, and of a fine taſte. It is of the anguilliform kind, and has a long and fat body, becoming ſmaller toward the tail; its belly is ſoft; its head flat; and its mouth of a parabolic figure, and armed with ſmall teeth; it is uſually of about eight or ten inches long; its tail is forked, and its head is covered with a ſtrong ſhelly coat; this is of a duſky brown; its back and ſides are of a blueiſh-grey; the larger back-fin is of the ſame colour; all the reſt are black; and on each ſide there is a red line reaching lengthways from the gills to the tail.

NHANDIROBA, in *Botany*, an American name, which Plumier adopted from Marcgrave, for the very diſtinct genus called by Linnæus FEUILLEA; ſee that article.

NHANDUAPOA, in *Ornithology*, the name of a Braſilian bird, called alſo *jabiruguacu*, but more frequently known by its Dutch name *ſcurvogel*. See MYCTERIA *Americana*.

NHANDUGUACU, the name of a Braſilian bird of the emeu, or caſſowary kind, a ſpecies of the *ſtruthio*, or oſtrich, in the Linnæan ſyſtem, but ſmaller than the common or African caſſowary. Its body is conſiderably large; its neck long and ſtrong; its legs very long and thick; its wings extremely ſhort, and unfit for flying, but aſſiſting it in running; its feathers are grey, and, on the back, are conſiderably long; it commonly carries its neck bent like a ſwan; its head is ſhaped like that of a gooſe; its back-feathers cover the rump, and make a ſort of tail; it runs as ſwift as a greyhound, and feeds on fleſh and fruits. See STRUTHIO *Rhea*.

NHAQUUNDA, in *Ichthyology*, the name of a ſmall fiſh caught in the American rivers. Its body is oblong, and every where nearly of the ſame thickneſs; its head and mouth are like thoſe of the pike; and its uſual length is about four inches; it can extend its upper lip, and round the opening of its mouth; it has no regular teeth, but its jaws are rough like a file; its tail is covered with a hard ſhelly cruſt; its body is covered with moderately large ſcales, and its back and ſides are of a ſilvery grey; its belly white; it has on each ſide a ſingle row of round black ſpots, of the bigneſs of a pea, and among theſe a number of ſmall blue ones.

NHING-KOUE, in *Geography*, a city of China, of the firſt rank, in the province of Kiang-nan; ſituated on a river which runs into the Yang-tſe-kiang, ſurrounded by woody mountains, and diſtinguiſhed by its manufactories of paper, made of a ſpecies of reed; it has under its juriſdiction ſix cities of the third claſs. N. lat. 31° 2'. E. long. 118° 24'.

NIAB, a town of Arabia, near the coaſt of the Red ſea; 72 miles W.S.W. of Saade.

NIABANI, a river of Weſt Florida, which runs into lake Maurepas, N. lat. 30° 17'. E. long. 90° 26'.

NIABUSSAN, a town of Bengal; 42 miles S.W. of Burdwan. N. lat. 22° 45'. E. long. 87° 25'.

NIAGARA, a town and fort of America, in the ſtate of New York, on the ſouthern ſhore of lake Ontario. The fort is ſituated on the eaſtern ſide of the river, and is now in the poſſeſſion of the United States, and on the oppoſite, or Britiſh ſide, is the town, moſt generally known by the name of Niagara, although it has been named "Newark" by the legiſlature. The original name of the town was Niajara; it was afterwards called Lenox, then Naſſau, and afterwards Newark. This town has been, and ſtill is, the capital of the province of Upper Canada, but it has been propoſed to remove the ſeat of government from this town to Torento, which was deemed a more eligible ſpot for the meeting of the legiſlative bodies, as being further removed from the frontiers of the United States. The projected change, however, was not reliſhed by the people at large, as Niagara is a much more convenient place of reſort to moſt of them than Torento. This change, however, was merely preparatory to another, which was the ſettlement of the ſeat of government in a new city, under the name of London, which

was to have been built on the river formerly called La Trenche, but now denominated the Thames, that runs into lake St. Clair. The fort was built by the French in the year 1725, but was taken by the Engliſh, under ſir William Johnſon, in 1759, and ſurrendered to the United States, according to the treaty of 1796, by the Britiſh. The town of Niagara ſtands on the ſummit of the weſtern bank of the river, about 50 miles from the water's edge, and contains about 70 houſes, a court-houſe, gaol, and a building intended for the accommodation of the legiſlative bodies. The houſes, with few exceptions, are built of wood; thoſe next the lake are rather poor, but at the upper end of the town are ſeveral excellent buildings, inhabited by the principal officers of government. Few places in North America have riſen more rapidly than Niagara, and after acquiring the addition of almoſt all its houſes in five years, it is ſtill enlarging in ſize, on account partly of the increaſe of the back country trade along the ſhores of the lakes, and partly of the ſurpriſing emigrations of people from the ſtates. The quantity of furs collected at Niagara is conſiderable, and the neighbourhood being populous, it is of courſe a place of no ſmall trade; but the town in which this trade is carried on, being on the Britiſh ſide of the line, the few merchants that lived within the limits of the fort immediately croſſed over to the other ſide, as ſoon as it was rumoured that the fort was to be given up. On the margin of Niagara river, about three-quarters of a mile from the town, ſtands a building called Navy-hall, erected for the accommodation of the naval officers on the lake during the winter ſeaſon, when their veſſels are laid up. Oppoſite to it there is a ſpacious wharf to protect the veſſels from the ſea during the winter, and alſo to facilitate the landing of merchandize when the navigation is open. All cargoes brought up the lake, that are deſtined for Niagara, are landed here. Adjoining the wharf are extenſive ſtores belonging to the crown, and alſo to private perſons.

The fort of Niagara ſtands immediately at the mouth of the river, on a point of land, one ſide of which is waſhed by the river, and the other by the lake. Towards the water it is ſtockaded; and behind the ſtockade, on the river ſide, a large mound of earth riſes up, at the top of which are embraſures for guns; on the land ſide it is ſecured by ſeveral batteries and redoubts, and by parallel lines of faſcines. At the gates, and in different parts, there are ſtrong blockhouſes; and facing the lake, within the ſtockade, ſtands a large fortified ſtone houſe. The fort and outworks occupy about five acres of ground; and a garriſon of 500 men, and at leaſt from 30 to 40 pieces of ordnance, would be neceſſary to defend it properly. The federal garriſon, however, conſiſts only of 50 men. From its ſituation the town commands a fine view of the lake and diſtant ſhores; and as it is ſo much elevated above the level of the water, one might imagine that it muſt be a remarkably healthy place, but it is, in fact, lamentably the reverſe, the inhabitants being very ſubject to the ague. Indeed, not only the town of Niagara and its vicinity are unhealthy places, but almoſt every part of Upper Canada, and of the territory of the ſtates bordering upon the lake, is likewiſe unhealthy. The ſickly ſeaſon commences about the middle of July, and terminates about the firſt week in September, as ſoon as the nights become cold. The moſt common diſorders are intermittent fevers. Weld's Travels, vol. ii. N. lat. 43° 14'. W. long. 79° 1'.

Niagara *River*, a river of Canada, which iſſues from the eaſtern extremity of lake Erie, and after a courſe of 36 miles diſcharges itſelf into lake Ontario. This river forms part of the boundary between the United States and Upper Canada. For the firſt few miles from lake Erie, the breadth of the river is about 300 yards, and it is deep enough for veſſels drawing nine or ten feet water; but the current is ſo extremely rapid and irregular, and the channel ſo intricate, on account of the numberleſs large rocks in different places, that no other veſſels beſide batteaux ever attempt to paſs along it. As you proceed downward, the river widens; no rocks are to be ſeen either along the ſhores, or in the channel, and the waters glide ſmoothly along, though the current continues very ſtrong. The river runs thus evenly, and is navigable with ſafety for batteaux as far as fort Chippeway, about three miles above the falls. For an account of theſe falls, we refer to the article Cataract.

NIAGAW, a town of Bengal; 12 miles S.S.W. of Noony.

NIAGEE, a town of Hindooſtan, in Bahar; 48 miles S.S.W. of Patna.

NIAGUR, a town of Hindooſtan, in the circar of the Ruttunpour; 27 miles N.W. of Ruttunpour.—Alſo, a town of Bengal; 28 miles N.W. of Rogonatpour. N. lat. 23° 45'. E. long. 86° 25'.

NIAK, a town of New York, on the right bank of the Hudſon; 23 miles N. of New York.—Alſo, an iſland on the S.W. coaſt of Eaſt Greenland. N. lat. 59° 45'. W. long. 43° 30'.

NIAKDELSKOI, a town of Ruſſia, in the government of Archangel; 62 miles N.N.W. of Kola.

NIALEL, in *Botany*, Rheede Hort. Malab. v. 4. 37. t. 16, a fine lofty evergreen tree, whoſe fruit, not unlike a bunch of grapes, is ſaid by Rheede to be eſteemed a delicacy. Linnæus has not referred it to any known plant. Juſſieu gueſſes it to be really a ſpecies of *Vitis*.

NIALMA, in *Geography*, a town of Thibet; 76 miles N. of Catmandu. N. lat. 29° 23'. E. long. 85° 27'.

NIANA, a town of Hindooſtan, in Dowlatabad; eight miles W. of Beder.

NIAPAGUR, a town of Bengal; 25 miles N. of Boglipour.

NIAPON, a town of Africa, in Whidah; 10 miles E. of Sabi.

NIARAN Kentchian, a mountain of Thibet. N. lat. 28° 25'. E. long. 83° 44'.

NIAS, a ſmall iſland, near the W. coaſt of the iſland of Sumatra, celebrated for the beauty of its females, who are purchaſed as ſlaves by the Dutch and Portugueſe reſiding in Batavia, and other places. N. lat. 1°. E. long. 97°.

NIASABAD, or Niczabad, a town of Perſia, in the province of Schirvan, with a harbour on the Caſpian ſea; 40 miles S. of Derbend. N. lat. 41° 18'.

NIB, in *Agriculture*, a term applied to the handle of a ſcythe.

NIBBIONE, in *Geography*, a town of Italy, in the department of the Lario; eight miles S.E. of Como.

NIBE, a town of Denmark, in North Jutland; nine miles W.S.W. of Aalborg.

NIBELES, an Abyſſinian inſtrument, a kind of common flute, joined to a bag which receives the wind. This inſtrument ſeems to reſemble the French muſette. Bruce.

NIBIANO, in *Geography*, a town of the duchy of Piacenza; 16 miles S.W. of Piacenza.

NIBU, a town of Japan, in the iſland of Niphon; 165 miles N.W. of Jedo.

NICÆA, in *Ancient Geography*, a town of Bithynia, upon the lake Aſcanius, according to Strabo, who gave it the title of "primaria Bithiniæ urbs." In his time it was of a ſquare figure, and about 16 ſtadia in circumference. It was encompaſſed with a very fertile plain. It was called Antigonia,

Antigonia, by Antigonus, ſon of Philip; but Lyſimachus afterwards called it Nicæa, in compliment to his wife, the daughter of Antipater.—Alſo, a town of the Locri Epicnemidii, in the Maliac gulf, according to Strabo.—Alſo, the ancient name of *Nice*, a town of Italy, on the confines of Liguria. It was a colony from Marſeilles, ſituated on the ſea-coaſt, about a league from the mouth of the Var. It held a diſtinguiſhed rank among the Greek towns of the Gauls, when the Romans undertook the conqueſt of Provence, about 158 years B. C. The ancient Marſilians gave it the name of *Nikh*, which ſignified victory, in commemoration of the advantages which they had gained in this place over the Ligurians. From Strabo we learn that long before his time Nice had a number of veſſels, an arſenal, and many warlike machines, of which the Romans availed themſelves in the conqueſt of Provence. In the time of this geographer, the Marſilians were ſtill maſters of it, but they did not poſſeſs it long after the reign of Tiberius. Many ancient inſcriptions prove that it was under the dominion of the Romans. But although it flouriſhed in the time of the ancient Marſilians, it loſt much of its ſplendour under the Roman emperors; ſo that by the authors of the lower empire it is merely deſcribed as the port of Nice or the caſtle of Nice. Its ſplendour and its commerce vaniſhed together.—Alſo, a town of India, on this ſide the Ganges, on the left bank of the Hydaſpes, over-againſt Bucephala, founded by Alexander after the victory obtained by him over Porus, upon the banks of the ſaid river.—Alſo, a town of the iſland of Corſica, founded by the Etrurians after they had gained the empire of the ſea, and taken poſſeſſion of the iſles adjacent to Etruria.

NICAISE, Claude, in *Biography*, a man of letters, was born at Dijon in 1623. He embraced the eccleſiaſtical profeſſion, and came to Paris, where he entered the univerſity, and ſtudied theology in the college of Navarre. In 1655 he paid a viſit to Rome, where he took prieſts' orders, and formed connections with all the eminent literati and artiſts of that capital. After a reſidence in Italy of ſeveral years, he returned to France, where he devoted himſelf entirely to literary purſuits, and chiefly to correſpondences with the learned of different nations. So great was his occupation of that kind, that he was regarded as the general intelligencer for all matters of lettered curioſity upon the continent. He died in 1701, at the age of ſeventy-eight. He had collected a numerous and well choſen library. He was author of ſeveral pieces, of which the following have been cited with applauſe: "De Nummo Pantheo;" "A Diſcourſe on the Form and Figure of the Syrens;" "A Diſſertation on the Schools of Athens and Parnaſſus," which were two of Raphael's pictures.

NICAMA, or Nigama, *Nega-patnam*, in *Ancient Geography*, a town to which Ptolemy gave the title of metropolis, ſituated near the ſouthern mouth of the river Chaberis, on the coaſt of the peninſula of India, on this ſide of the Ganges, north of the "promontorium calligicum."

NICANDER, in *Biography*, a celebrated Greek phyſician, grammarian, and poet, reſpecting whoſe birth-place, and the era in which he flouriſhed, there is a conſiderable variety of opinion. Suidas informs us, that he was the ſon of Xenophon, of Colophon, a town of Ionia; although he admits, that other writers conſider him as a native of Ætolia. We have, however, the teſtimony of Nicander himſelf, that his birth-place was Claros, a little town in Ionia, near Colophon, and that he was born in the neighbourhood of the temple of Apollo. With reſpect to the age in which he lived, authors are not more agreed. He is commonly ſuppoſed to have flouriſhed about the 160th olympiad, and 140 years before Chriſt, in the reign of Attalus I., king of Pergamus; while others are of opinion, that he was in the zenith of his reputation in the reign of the laſt king of that name, Attalus Philometor, and in that of Ariſtonicus. According to this account he muſt have lived upwards of a century later than is commonly ſtated. He was the author of many works, but the two following alone remain, namely, the poems entitled "Theriaca," and "Alexipharmaca." In the former, he deſcribes the effects of the bites of venomous animals; and in the latter, he treats of their antidotes. Among the works which are loſt, were ſimilar poetical pieces, entitled "Ophiaca," which related to ſerpents, and "Hyacinthia," which was a collection of remedies. Athenæus alſo cites in ſeveral places, ſome poetical works of Nicander upon the ſubject of agriculture, which have been called his "Georgics." Beſides theſe works, he is ſaid to have compoſed five books of "Metamorphoſes," which were the prototypes of thoſe of Ovid, and were cloſely copied in thoſe of Antonius Liberalis; and to have written ſeveral hiſtorical pieces, eſpecially "A Hiſtory of Colophon," a work entitled "Ætolics," and a general hiſtory of Europe; ſo that his various knowledge ſeems to have merited the eulogies which were paſſed upon him in ſeveral epigrams, in the firſt book of the "Anthologia." A great number of editions of the two poems firſt mentioned, in Greek, and in Latin verſions, have been printed, at different times and places. Eloy Dict. Hiſt. Hutchinſon, Med. Biog.

NICANDRA, in *Botany*, named by Schreber in honour of Nicander, of Colophon, an ancient Greek poet, and prieſt of Apollo, who lived about the time of Attalus. His Georgics are greatly commended by Cicero, and are interſperſed with various botanical remarks, though this work is for the moſt part loſt. Of his two poems which are known and remain entire, περι αλεξιφαρμακων, and περι θηριακων, Dioſcorides has made much uſe. Theſe paſſed through various editions during the ſixteenth century. Haller notices a very beautiful manuſcript of Nicander preſerved at Vienna. Schreb. 283. Willd. Sp. Pl. v. 2. 541. Mart. Mill. Dict. v. 3. (Potalia; Aubl. Guian. v. 1. 394. Juſſ. 143. Lamarck Illuſtr. t. 348.)—Claſs and order, *Decandria Monogynia*. Nat. Ord. *Gentianæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, turbinate, thick, coloured, cloven into four, broad, concave, obtuſe ſegments; the two oppoſite, outer ones larger; the two inner ſmaller. *Cor.* of one petal; tube very ſhort; limb deeply cloven into ten, oblong, imbricated ſegments, incurved and rigid at the top. Nectary, a membranous, ſhort ring, ſurrounding the baſe of the germen. *Stam.* Filaments ten, very ſhort, connected with the nectary, inſerted into the receptacle; anthers linear, ſquare, acute, erect, approximated. *Piſt.* Germen ſuperior, ovate; ſtyle ſhort; ſtigma peltate, orbicular, ſix-rayed. *Peric.* Berry roundiſh, ſix-furrowed, three-celled. *Seeds* numerous, very ſmall, angulated.

Eſſ. Ch. Calyx turbinate, four-cleft. Corolla of one petal, deeply ten-cleft. Filaments inſerted on the ring of the nectary. Berry ſix-furrowed, three-celled, and many-ſeeded.

1. N. *amara*. Linn. Syſt. ed. Gmel. v. 2. 677. Willd. (Potalia amara; Aubl. Guian. t. 15..)—Native of extenſive foreſts in Guiana, flowering in July or Auguſt, and bearing fruit in October. *Root* perennial, woody and fibrous. *Stem* ſimple, ſtraight, hard, woody, knotty, the thickneſs of a finger. *Leaves* oppoſite, ſtalked, entire, ſmooth, narrow at the baſe, roundiſh and pointed at the end, a foot and half long, about five inches wide, with a protuberant mid-

mid-rib underneath. *Stalks* rounded, attached to a ſheath that embraces the ſtem. *Flowers* terminal, about twenty together on one, two or three ſtalks, each having a partial ſtalk with two ſcales at its origin. The *calyx* is of a golden colour. *Corolla* white. *Fruit* yellow, fleſhy, the ſize of a cherry.

Aublet remarks that every part of the plant is extremely bitter, and that its young twigs are furniſhed with particles of a yellow tranſparent reſin, which is very inflammable, and emits a ſweet ſavour when burnt, ſomething like Benzoin. The leaves and twigs are uſed for an infuſion, to be given in venereal caſes, or where there is a ſuſpicion of poiſon, being, in a large doſe, highly emetic.

NICARACOOL, in *Geography*, a town of Hindooſtan, in Golconda; 55 miles E.S.E. of Hydrabad.

NICARAGUA, a province of Mexico or New Spain, in the domain of Guatemala, bounded on the N. by Honduras, on the E. by the North ſea, on the S. by Coſta Rica, and on the E. by Guatemala, and the Pacific ocean. This is one of the moſt woody provinces of New Spain; but the plains are very fertile. It produces good flax and hemp, and alſo the wood uſed by the dyers in Europe, called Nicaragua wood; but little wheat. It abounds with black cattle and hogs, but ſheep are ſcarce. Balm, cotton, ſugar, American pepper, liquid amber, and turpentine, are plentiful; and together with the produce of the ſilver mines, enable the inhabitants to carry on a conſiderable trade with Panama and Nombre de Dios. Turkeys and alſo parrots are numerous. The country itſelf is ſo pleaſant and ſo productive, that it has been reckoned the garden of America; the hills and ſands of the rivers furniſh gold, whilſt the fields and woods are perfumed with odoriferous plants and flowers, inſomuch that when the Spaniards firſt viſited it, they called it "Mahomet's Paradiſe." The winter in this province is rainy and tempeſtuous, and the ſummer very hot, but healthy. The natives are accounted ſingularly ingenious, eſpecially as muſicians and goldſmiths. The capital of this extenſive province is *Leon;* which ſee. Granada, formerly called Nicaragua, and erroneouſly ſo denominated in our maps, is another little town, on the great lake of Nicaragua.

NICARAGUA *Lake*, the chief lake in Spaniſh North America, which is about 170 Britiſh miles in length, from N.W. to S.E., and about half that breadth. This grand lake is ſituated in the province of the ſame name, towards the ſouth of the iſthmus, and has a grand outlet, the river of St. Juan, to the gulf of Mexico; while a ſmaller ſtream is by ſome ſuppoſed to flow into the Pacific. Under the direction and exertions of an enterpriſing people, this lake might ſupply the long wiſhed-for paſſage, in the moſt direct courſe, from the Atlantic into the Pacific. This lake is navigable for ſhips of the line, and the river of St. Juan is alſo navigable through its whole courſe for large ſhips. On the other ſide the ſpace to be cut, in order to complete the communication, would not exceed, according to the beſt and moſt recent maps, 10 or 12 Engliſh miles, and in order to open a grand navigation, might coſt about 200,000*l.* ſterling. The lake itſelf would afford the ineſtimable advantage of a large internal port, capable of being defended by fortreſſes on both ſides. This lake is remarkable for numerous farms on its ſhores, abounding in horſes and beavers, each having a little port where canoes and barks arrive, and load with great diſpatch. There are ſeveral pictureſque iſlands, ſome of which are volcanic. The water in this lake is ſaid to ebb and flow like the ſea; it abounds with fiſh, but is infeſted with crocodiles.

NICARIA, an iſland of the Grecian archipelago, anciently called "Icaria," on account of the ſon of Dædalus, who fell there in the midſt of his raſh flight, whence, as ſome have ſuppoſed, the ſurrounding ſea took the name of the *Icarian ſea*, which ſee. (See alſo ICARUS.) This is an inconſiderable iſland; its length greatly exceeds its breadth; it is diſcoverable at a very great diſtance; but navigators make no attempt to land here, as it has no harbour. A ſcanty population, want of energy, a ſoil in ſeveral diſtricts unfavourable, and general diſcouragement impreſſed by the government through the extent of its dominion, are circumſtances little calculated to repair the diſadvantage of an iſland, which has no places of ſhelter for ſhipping, and conſequently no great means of trade; ſo that Nicaria may be reckoned among the moſt wretched iſlands of the archipelago.

NICASTRO, a town of Naples, in Calabria Ultra; the ſee of a biſhop, ſuffragan of Reggio; nearly deſtroyed by an earthquake in 1638; 18 miles S. of Coſenza. N. lat. 38° 3'. E. long. 16° 37'.

NICAVA, a town of Japan, in the iſland of Nipſion; 160 miles N.W. of Jedo.

NICAUAR, a town of the iſland of Ceylon; 50 miles S.W. of Trincomaly.

NICCA, a town of the iſland of Cherſo, in the Adriatic; 20 miles W. of Cherſo.

NICCOLI, NICCOLO, in *Biography*, a meritorious contributor to the reſtoration of learning in Italy, was the ſon of a merchant at Florence, where he was born in the year 1364. In obedience to his father's commands, he paſſed ſome of the firſt years of his life in commercial purſuits; but as ſoon as he was enabled to follow his own inclinations, he devoted himſelf entirely to literature. He contracted an acquaintance with all the learned men of Florence, and ſo deſirous was he of improvement, that he went to Padua for the ſole purpoſe of copying the Latin works of Petrarch, which were then in very high eſteem. Previouſly to the invention of printing, tranſcribing manuſcripts was a conſiderable part of the labour of a ſcholar, and it is ſaid, that a great number of works, copied or corrected by Niccoli, are ſtill extant. With theſe, and with others which he purchaſed, he formed a ſelect and copious library for that age, and with a liberality ſuperior to that of many collectors, he granted the free uſe of his ſtores to all who wiſhed. He was conſiderably inſtrumental in promoting that diſcovery of ancient authors, which was the moſt important ſervice then to be rendered to letters. Poggio has recorded the pecuniary aſſiſtance afforded to himſelf, in his learned reſearches, by Niccoli, who was alſo the patron of other celebrated ſcholars that flouriſhed in this period: it was chiefly through his influence that Manuel Chryſoloras, Guarino Veroneſe, and Fifelfo, were invited to Florence as public profeſſors. The houſe of Niccoli was, we are informed, the common reſort of the learned. Poggio introduces Niccoli as a prominent figure in his "Dialogue on the Unhappineſs of Princes," and repreſents him as detailing the miſeries of exalted rank. On this ſubject he dilates at conſiderable length, proving, from hiſtory, that the beſt of princes are liable to the bittereſt woes incident to human nature. Gaining courage as he proceeds, he attempts to demonſtrate that eminence of ſtation is unfriendly to virtue, and ſhews that it has frequently happened that men who have adorned a private ſtation by their virtues, have become the diſgrace of human nature when they have been raiſed to the ſummit of power: hence he infers, that as happineſs ſeems to be baniſhed from the palaces of the great, if ſhe reſides any where on earth, ſhe muſt be found in the abodes of private individuals, who have wiſdom to ſet bounds to their deſires, and to dedicate themſelves

ſelves to the cultivation of their intellectual powers. The conduct of theſe men he propoſes as an object of imitation, and exhorts his friends to the ſtudy of thoſe principles of philoſophy which will render them happy in themſelves, and fearleſs of the power, and independent of the favours of the great. Niccolo Niccoli died at the age of 73, in 1437, and Poggio pronounced over him a funeral oration, in which he gives him almoſt unbounded praiſe. His merits as a benefactor to literature cannot be diſputed, and he conſulted its intereſts after his death, by the bequeſt of his library to the public. This is ſaid to have been the firſt public library opened ſince the times of antiquity; his intention, however, could not have been carried into effect, had not Coſmo de Medicis undertaken to ſatisfy the demands of his creditors, which were numerous. Shepherd's Life of Poggio Bracchiolini. See alſo the article BRACCHIOLINI.

NICE, in *Geography*, a province of Italy, now ſubject to France, bounded on the N. by Piedmont, on the E. and S. by the ſtate of Genoa and the Mediterranean, and on the W. by Provence, to which it was formerly annexed; lying in N. lat. 44°, and E. long. 7° 20', and being 45 miles from N. to S., and 25 to 50 from W. to E. It contains the following ſix diſtricts or counties: 1. The county of "Tenda," about 12 leagues N.N.E. of Nice, conſiſting of mountains and agreeable vallies, with a ſmall town of the ſame name, on a declivity bathed by a rivulet that has a ſoutherly courſe, and runs into the ſea at Ventimiglia. The paſſage of Tenda acroſs the mountain is more difficult than that of mount Cenis. 2. The county of Broglio, with a ſmall town of the ſame name, lying among the mountains; 30 miles N.N.W. of Nice. This county is ſeparated from France, excepting only where the line of diviſion runs along the ſummits of the mountains, by the rapid Var and the Eſteron. 3. The marquiſate of "Dolce aqua," watered by the Navia, and fruitful in wine and oil; it has a town of the ſame name defended by a fort. 4. The county of "Nice," lying on the ſea-coaſt, in 43° 45' N. lat. remarkable for the temperature of its climate. (See NICE, below.) 5. The principality of "Oneglia," 45 miles N.E. of Nice, environed by the Genoeſe territories, and divided into three vallies abounding in wine, oil, and fruits. Oneglia is a little trading town on the ſea coaſt. 6. The valley of "Barcelonetta," yielding good paſture, lies at the N.W. extremity of the principality, on the frontiers of Dauphiné and Provence, ceded by France A. D. 1760. The town of the ſame name, ſeated on an eminence, was founded A. D. 1230 by Raymond Berenger. The country called Nice, formerly belonging to Italy and France, is now annexed to the latter, and forms the department of the Maritime Alps.

NICE, *Nicæa*, *Nexaia*, or *Nizza*, a city and ſea-port of France, and capital of the department of the Maritime Alps, ſituated on a rock near the foot of the Alps, at the mouth of the river Paglione, on the left bank of the Var. It contains a cathedral, eight pariſh churches, and thirteen religious houſes. The town includes 18,475, and the canton the ſame number of inhabitants, on a territory of 22½ kiliometres, in one commune. Towards the W. it is fortified with a wall and ditch, and defended by a caſtle. The ſtreets of the old town are narrow and crooked; but thoſe of the new town are wide and ſtraight, with handſome houſes. The ſuburbs, moſt of which are in ruins, are principally inhabited by foreigners. Its harbour is convenient for ſmall veſſels, but expoſed to the ſouth wind. The adjacent country is pleaſant and delightful, the whole plain being highly cultivated with vines, pomegranates, almonds, oranges, lemons, and all kinds of vegetables. The hills are ſhaded to the top with olive trees, among which villas and country houſes are interſperſed. Winter here is warm and agreeable; in March and April cold eaſt and north-eaſt winds prevail; autumn is uſually wet; and ſummer intolerably hot. The air in general is ſerene, dry, claſtic, and impregnated with ſalt. At Cimea, two miles from Nice, are the remains of a Roman amphitheatre, temple, aqueduct, bath, &c. The enjoyments furniſhed by this delightful country are not without their alloy. In ſummer the heat is intenſe; and reptiles and vermin abound, ſuch as vipers, ſnakes, and ſcorpions; fleas, bugs, and particularly gnats, become intolerable nuiſances throughout the year. This town was founded by the Phocæans, after they had built Marſeilles, about 500 years B. C., on their return from an expedition againſt the Salii and the Ligurians, and was named *Nicæa*, which ſee. It has undergone many viciſſitudes in the later periods of its decline. It ſuffered very much in the year 1543, when it was beſieged by land by the army of Francis I.; and the Turkiſh fleet, under Barbaroſſa, preſſed on it by ſea: it was taken, pillaged, and nearly reduced to aſhes. Having previouſly changed maſters, the citizens availed themſelves of the liberty granted them by Ladiſlaus, to chooſe their own protector, and took the oath of fidelity to Amadeus VII., count of Savoy. The government was a ſpecies of democracy. The inhabitants are divided into four claſſes, the nobles, the merchants, the artiſans, and the huſbandmen, each claſs electing yearly a conſul, and ten counſellors. In the year 1792 the French took poſſeſſion of Nice, and the inhabitants ſeemed diſpoſed to unite cordially with their new maſters; for in September 1793, when an Engliſh veſſel arrived here with a flag of truce, and a proclamation to the people, exhorting them to accept the royal conſtitution of 1789, the magiſtrates of the city replied, "that French republicans would never become ſlaves, and that no farther anſwer would be made to royaliſts, except from the mouths of cannon." N. lat. 43° 31'. E. long. 7° 18'.

NICE, *Council of*, in *Eccleſiaſtical Hiſtory*, held at Nice in Bithynia A. D. 325, convened by Conſtantine in order to ſettle differences and controverſies which had taken place among the Chriſtians, of which Euſebius has given an account. It was ſummoned by letters conveyed by Conſtantine in 324 into the ſeveral provinces of the empire, together with orders for furniſhing the biſhops with beaſts, or carriages, and for bearing the expences of their journey. The biſhops who met in this council were, according to Euſebius's ſtatement, more than 250, beſide preſbyters and deacons, acolythiſts and others, whoſe number could not be eaſily counted. We have different eſtimates of the number of biſhops who attended on this occaſion. The number generally allowed is that of Theodoret, who reckons them at 318. How long this council ſat is not abſolutely certain. Some have given it a permanence of two or three years; but moſt learned moderns are of opinion, that it ſat ſomewhat above two months, beginning the 19th of June and riſing the 25th of Auguſt. The three points debated and determined in this council were the Arian controverſy, the time of keeping Eaſter, and the affair of Meletius in Egypt. Nothing now remains of this council, but the creed, the ſynodical epiſtle, and 20 canons. This council has received great commendations from many, both ancients and moderns. Epiphanius reckoned the two great benefits which the church received from divine providence by means of Conſtantine, to have been a determination of faith againſt Arians, and a certain rule for keeping Eaſter. Moderns have conſidered this council not only as the firſt ecumenical council, but alſo as the moſt celebrated council, ſince the time of the Apoſtles. It is the moſt famous, and the moſt venerable of all councils; than

than which the church has nothing more illuſtrious. It has, however, been cenſured by ſome of former, as well as later ages. As for the Meletian crontroverſy or ſchiſm, which was to be terminated by this council; it requires no particular mention. As to the time of keeping Eaſter, the council determined that it ſhould be obſerved by all on the Sunday which immediately followed after the 14th of the moon, that happened next after the vernal equinox; which equinox happened that year on the 21ſt day of March. (See EASTER.) But the principal determination of the council of Nice relates to the Arian controverſy. On this determination, the learned, impartial, and candid Lardner makes the following remarks. 1. That their deciſions had not the intended effect; peace and unity were not thereby reſtored to the churches. Notwithſtanding the profeſſions made by many of a high veneration for councils, men do not value them any farther, than they countenance their own particular opinions: and if they are under no reſtraints of external force, they contradict their deciſions without ſcruple. 2. No man, or number of men ſeparate, or united in council, ſince the time of Chriſt and his apoſtles, have any right to decide in matters of faith. It is inconſiſtent with the reſpect due to Jeſus Chriſt, to attempt it: unleſs they can ſhew themſelves to be inſpired, and work miracles, to manifeſt evidently a divine commiſſion. If ſuch a caſe ſhould happen, which is very unlikely, what ſuch perſons propoſe muſt be tried and examined by the doctrine of the goſpel, delivered in the New Teſtament. 3. The introducing of force and authority in matters of a ſpiritual nature, is ſubverſive of true religion and virtue. The council of Nice unqueſtionably introduced authority and force in the church, and the affairs of religion. Or if authority had been introduced before, they now openly countenanced it, and gave it a further ſanction. 4. When this council met, inſtead of deciding by their authority, and enforcing by wordly menaces and recompences any ſpeculative doctrines, they ſhould rather have recommended forbearance and moderation to all parties. See COUNCIL.

NICEA, in *Geography*, a town of European Turkey, in the Morea; 18 miles E.N.E. of Miſitra.

NICENE CREED. See CREED.

NICEPHORIUM, in *Ancient Geography*, *Racca*, a town of Aſia, in Meſopotamia, according to Ptolemy, who places it between Maube and Maguda. Pliny ſays, that Alexander availed himſelf of the advantageous ſituation of this place for building a town; and Steph. Byz. ſays, that it was afterwards re-eſtabliſhed by the emperor Conſtantine. It was ſituated on the eaſtern bank of the Euphrates, near the place where the Billicha diſcharged into this river. M. d'Anville conceives it to have been the place which was called Callinicum or Callinicus, and under the emperor Leon, Leontopolis.—Alſo, a town of Aſia Minor, near the Propontide, which, according to Arrian, was a fortified place, in which were temples.

NICEPHORIUS, a river of Armenia, which, according to Tacitus, watered and guarded the town of Tigranocerta, and diſcharged itſelf into the Tigris.

NICEPHORUS I. in *Biography*, emperor of the Eaſt, ſurnamed "The Logothete," was great treaſurer and chancellor of the empire at the time when a revolt of the nobility from the empreſs Irene diſpoſſeſſed her of the throne, A.D. 802. Nicephorus was inveſted with the purple, and ſolemnly crowned at St. Sophia, while Irene was firſt confined to a monaſtery, and afterwards baniſhed to the iſle of Leſbos. In a ſhort time after his acceſſion he made a treaty with the emperor Charlemagne, and having ſuppreſſed a revolt excited by Bardanes, the governor of one of his provinces, he ſtrengthened his throne by the aſſociation of his ſon Saturacius. The emperor now declared his intention no longer to pay the accuſtomed tribute to the Saracens; the caliph Haroun-al-Raſhid announced his determination of marching an army to enforce it, and accordingly made an incurſion into Phrygia. Nicephorus, on this occaſion, was completely defeated, and with difficulty made his eſcape. Nicephorus made another attempt to free himſelf from this bondage, but after a fruitleſs, and even a diſaſtrous ſtruggle, he agreed to the moſt humiliating terms, *viz.* to pay a yearly tribute in coin, ſtamped with the image of the Saracen, and not to repair his demoliſhed fortreſſes. A violation of this laſt condition produced a new invaſion, in which the Saracens ravaged the provinces with more cruelty than before. Theſe public calamities were aggravated by internal diſcontents and conſpiracies, which were puniſhed by the emperor with extreme rigour, and cauſed his reign to be a perpetual ſcene of ſuſpicion and tyranny. The peace of the empire was diſturbed in 809 by a new enemy, who invaded it on the oppoſite ſide. The Bulgarians entered Mœſia, and ſurpriſing the city of Sardica, put the whole garriſon to the ſword. On the approach of the emperor they retired with their booty beyond his reach. Two years after this, Nicephorus, determined to revenge the inſult, and diſable them from future hoſtilities, penetrated to the centre of the country, and ravaged it in a mercileſs manner with fire and ſword. This conduct, however, drove the enemy to deſpair, and collecting all his force, he made an unexpected attempt upon the emperor's camp, which he forced, and Nicephorus, with his chief officers, and the greater part of his army, were ſlain. Not ſatisfied with the death of the emperor, the barbarian conqueror cauſed his head to be cut off and expoſed on the point of a ſpear; and his ſkull, ſet in gold, ſerved afterwards for his uſual drinking cup. This cataſtrophe took place in July 811. By monkiſh hiſtorians, Nicephorus is repreſented as a monſter of avarice, cruelty, and debauchery. To this they add impiety, which he manifeſted by his favour to heretics, and his contempt for the church of Rome.

NICEPHORUS II., PHOCAS, emperor of the Eaſt, was the ſon of Bardas Phocas, and commander of the imperial army in Aſia. Nicephorus was brought up to the army, and ſucceeded his father in the chief command in Aſia. He defeated the Saracens on various occaſions, and in the reign of Romanus recovered the whole iſland of Crete in a ſeries of actions of ſeven months continuance. After this he was ſent againſt the Saracen caliph of Syria, whom he defeated, and then captured the important city of Beræa. On the death of Romanus he returned to Conſtantinople, where he obtained the honour of a triumph. Finding that he was ſuſpected of ambitious deſigns by the prime-miniſter Joſeph, he requeſted a private audience with him, at which he pretended an averſion for all worldly dignities, and a reſolution to retire to a monaſtic life, ſhewing him, at the ſame time, a hair cloth which he wore next his ſkin. The miniſter, duped by his hypocriſy, ſuffered him to return to the army of the Eaſt, where his fellow-commanders, Zimiſces and Curcuas, perſuaded, or compelled him to aſſume the title of emperor, which was conferred upon him in the year 963. He returned to Conſtantinople, where he was crowned by the patriarch. His warlike diſpoſition was manifeſted in the continual aſſaults which, in perſon or by his generals, he made upon the Saracen power. He ſent Manuel, the natural ſon of his uncle Leo, with a powerful army, on an attempt to expel the Saracens from the iſland of Sicily, but the unſkilfulneſs of the leader cauſed his total deſtruction. His lieu-

tenant and former comrade, John Zimiſces, ſucceeded better againſt the ſame enemy in Cilicia and Cyprus. The emperor, having in the fourth year of his reign beſieged and reduced the cities of Mopſueſta and Tarſus, invaded Syria, took ſeveral towns, and inveſted Antioch itſelf; but on the approach of winter he was obliged to quit it, and return to his capital. Antioch was, however, in a ſhort time afterwards ſurpriſed by one of his generals. This career of victory, ſplendid as it was, produced unpopularity at home, on account of the new taxes which he was forced to impoſe, and at the ſame time he offended his generals by the ſuſpicions with which he requited their ſervices. At length a conſpiracy was formed againſt him, and by the contrivance of the empreſs, Zimiſces, with a band of aſſaſſins, was admitted, by night, into the palace, and Nicephorus, who had once been honoured with the title of the "Morning Star," was cut off A.D. 969, in the 57th year of his age, and the ſeventh of his reign. Univer. Hiſt. Gibbon, vol. x.

Nicephorus III., Botoniates, emperor of the Eaſt, was a general under Conſtantine Ducas, when he was defeated and taken priſoner in an invaſion of the Scythian Uzians. He was commander of the Aſiatic forces of the empire, when Michael Ducas encouraged him to revolt, and make an alliance with the Turks, whom he had been ſent to oppoſe. He was ſolemnly recogniſed as emperor, and crowned by the patriarch in March 1078. Alexius Comnenus was employed by him againſt three competitors, *viz.* Urſellius, Bryennius, and Baſilacius. All theſe he ſucceſſively reduced, and Nicephorus ſtrengthened his authority by marrying Mary, who had been the wife of Michael Ducas. He was now advanced in years, and having no male iſſue, he was perſuaded, by two favourites, to nominate in his teſtament for his ſucceſſor, a youth who was his relation. The empreſs, however, anxious that her ſon ſhould ſucceed to the empire, determined, with the aſſiſtance of Alexius and Iſaac Comnenus, to depoſe Nicephorus, which ſhe quickly effected, and the emperor quitted the throne, after a reign of three years. He retired to a monaſtery, where he took the habit, and ended his days in obſcurity and peace. Univer. Hiſt. Gibbon, vol. x.

Nicephorus, patriarch of Conſtantinople in the beginning of the ninth century, was a native of that city, the ſon of Theodorus, ſecretary to the emperor Conſtantine Copronymus. He became confidential ſecretary to the emperor, and his mother Irene. He attended in his official capacity at the ſecond council of Nice in the year 787, where his talents and influence were zealouſly exerted in defence of image-worſhip. The manners of a court were ill adapted to his mind, and he withdrew into a monaſtery on the Thracian Boſphorus, but not as a member of the religious community. In 806, upon the death of the patriarch Taracius, he was elected his ſucceſſor in that dignity while a layman. In the year 814, an edict having been promulgated by the emperor Leo, the Armenian, for the ſuppreſſion of the worſhip, the patriarch made uſe of all the means in his power to prevent it from being carried into execution. For this he was baniſhed, and he ſpent a great part of his exile in a monaſtery which had been founded by himſelf in the iſland of Propontis, where he was confined till his death in the year 828. He was a man of ſtrong natural abilities, and he had acquired high intellectual endowments. By the Greek and Latin churches he is honoured as a confeſſor. He was author of ſeveral works, of which the moſt conſiderable is "An Abridgment of Hiſtory," commencing with the death of the emperor Mauritius, and ending in the reign of Irene. Another work attributed to him, is "A Chronological Catalogue of all the Patriarchs, Kings, and Princes of the Jews, Kings of Perſia and Macedon, Roman Emperors, &c." He alſo wrote three books, entitled "Antirrhetics," againſt the council held at Conſtantinople, under Conſtantine Copronymus, which aboliſhed the uſe of images. He is ſuppoſed, by Lardner and others, to have been the author of "The Stichometry," which contains a catalogue of the books of ſacred ſcripture, which is of uſe to ſhew that the Jewiſh canon was generally eſteemed ſacred by Chriſtians, and that the other books of the Old Teſtament, which are now deemed "Apocryphal," were not of equal authority, though ſometimes read in the churches, and quoted by Chriſtian writers. It affords likewiſe ſtrong evidence to prove, that there never were any Chriſtian writings eſteemed to be of equal authority with thoſe which are now received by us as ſacred and canonical. A letter of this patriarch to pope Leo, containing his confeſſion of faith, may be found in the ſeventh volume of the Collect. Conciliorum. Lardner. Moreri. Gen. Biog.

Nicephorus, Callistus, the ſon of Calliſtus, ſurnamed *Xanthopulus*, a learned monk of Conſtantinople, who flouriſhed in the 14th century, was a very ſtudious man, and was for many years employed in the diligent peruſal of the books in the celebrated library belonging to the church of St. Sophia. While he was a very young man, he undertook to write, in the Greek language, "A New Eccleſiaſtical Hiſtory," collected out of Euſebius, Socrates, Sozomen, and others, and he completed the work before he was thirty-ſix years of age. It was addreſſed to the emperor Andronicus Palæologus the elder, and divided into twenty-three books, extending from the birth of Chriſt to the death of the emperor Leo, *the philoſopher*, in the year 911. Eighteen only of theſe have reached our times, which bring the hiſtory to the death of the emperor Phocas, or the year 610. On account of the elegance of the compoſition, the author has been ſtyled the "eccleſiaſtical Thucydides," while others, from the marvellous tales and fables which are interſperſed in it, have given him the name of the theological Pliny. It is extremely uſeful on account of the light which it throws on many important facts in eccleſiaſtical hiſtory. The only MS. of it yet diſcovered belonged to the library of Matthias, king of Hungary, at Buda, where, on the capture of that city, it became part of the plunder collected by a Turk, who carried it to Conſtantinople, from whence it paſſed to the Imperial library at Vienna. It has undergone ſeveral impreſſions. Beſides this work, Nicephorus wrote "A Catalogue of the Conſtantinopolitan Emperors," and another of the Patriarchs, both in Greek Iambic verſe; and "An Abridgment of the Scriptures," in the ſame kind of verſe. Dr. Hody has attributed to him a ſmall piece, which he publiſhed in Greek and Latin, during his controverſy with Mr. Dodwell, under the title of "Anglicani Schiſmatis Redargutio." Gen Biog.

Nicephorus Gregoras, one of the Byzantine hiſtorians, who flouriſhed in the 14th century, was a favourite of Andronicus Palæologus the elder, who made him librarian of the Conſtantinopolitan church, and ſent him on an embaſſy to the prince of Servia. He followed that emperor after his depoſition, and was with him at his death. After this he went to the court of Andronicus the younger, where he was the cauſe of the refuſal of the Greeks to enter into a conference with the legates of pope John XXII. In the diſputes that took place between Barlaam and Palamas, he took the part of the former, whom he warmly ſupported in the council held at Conſtantinople in 1351. For this he was thrown into priſon, and was not liberated till the return of John Palæologus. Nicephorus wrote eleven books of the Byzantine hiſtory, comprehending a period of 145 years, from

from Theodore Laſcaris I. to the death of the younger Andronicus in 1341. This was printed at Baſil in 1561, with a Latin verſion, by Jerome Wolff. Gregoras alſo wrote the life of his uncle John, metropolitan of Heraclea, and he compoſed *Scholia* on Syneſius "De Inſomniis," which have been publiſhed, beſides other pieces ſtill in MS. Moreri.

NICERON, John Francis, a French mathematician in the ſeventeenth century, was born at Paris in the year 1613. At a very early age he diſplayed a love of learning, and by the progreſs which he made in his elementary ſtudies, afforded a fair promiſe of future excellence. At the age of nineteen he entered the order of Minims, and it was ſoon diſcovered that his genius was decidedly in favour of the mathematical ſciences, to which, after he had completed his theological courſe, he devoted all the time that was not neceſſarily occupied by the duties of his profeſſion. The ſcience of optics was that which principally engaged his attention, and his performances afforded ſatisfactory evidence of his profound ſkill in that branch of natural philoſophy. He became acquainted with Des Cartes, but their intimacy was but of ſhort duration, as Niceron died at the early age of 33, in the year 1646. This event was regarded as a conſiderable loſs to the republic of letters. He was author of many works, of which the following may be mentioned: "Interpretation of Cyphers;" "Curious Perſpective, or artificial Magic produced by the wonderful Effects of Optics, Catoptrics, and Dioptrics," which was introductory to another on the ſame ſubject, but much larger, entitled "Thaumaturgus Opticus, ſive, admirandæ Optices, Catoptrices, et Dioptrices, Pars prima, de iis quæ ſpectant ad viſionem directam," which he left unfiniſhed.

Niceron, John Peter, a man of letters, was born at Paris in 1685: he entered into the congregation of Barnabites, and became in due time profeſſor of the languages, and then of theology. He took prieſts' orders in 1708; but in 1716 he was called to reſide at Paris, where he henceforth occupied himſelf in literary purſuits, to which he had ever been warmly attached. Beſides the ancient learned languages, he was well acquainted with the principal modern ones of Europe, and ſome of his early publications were tranſlations from the Engliſh. The work by which he is principally known, is entitled "Mémoires pour ſervir à l'Hiſtoire des Hommes illuſtrès dans la République des Lettres, avec un Catalogue raiſonné de leurs Ouvrages." The firſt volume of this publication was given to the world in 1727, and the others were printed in ſucceſſion to the forty-third, but the laſt three were not wholly the production of Niceron. The author gave the title of *illuſtrious men* to a great number of perſons having no claims whatever to celebrity, but his reſearches into the hiſtory of publications are reckoned both curious and uſeful. Niceron died at Paris in 1738. He was extremely amiable in his private character, and though his time was chiefly ſpent in the retirement of deep ſtudy, yet when in company he poſſeſſed a fund of cheerfulneſs and animation. His eulogy may be found in the fortieth volume of the memoirs above-mentioned, which was written by the abbé Goujet. Moreri.

NICETAS, Achominatus, ſurnamed *Choniates*, a modern Greek hiſtorian, was born at Chone, in Phrygia, and filled, in the early part of the 13th century, a dignified ſtation in the court of Conſtantinople. At the capture of that city by the Franks, in 1204, he withdrew, with a young woman whom he reſcued from the enemy, to Nice, in Bithynia, and married her. He died in 1206. He is known as the writer of a period of Byzantine hiſtory from the death of Alexius Comnenus, where Zonaras ceaſes, to the year 1203, being 85 years, in 21 books, which are ſtill extant. They were printed by Jerome Wolff at Baſil in 1557, and were inſerted in the Louvre edition of the Byzantine hiſtorians of 1647. The hiſtory is valued on account of the truth of its facts. Banduri, in his "Imperium Orientale," has printed a ſmall piece by Nicetas on the ſtatues melted down by the Latins when they took Conſtantinople. To Nicetas alſo have been attributed the five firſt books of the "Treaſure of the Orthodox Faith," tranſlated by Morel, and printed in 1580. Moreri.

Nicetas, ſurnamed *Serron*, biſhop of Heraclea in the eleventh century, was author of a commentary upon the oration of Gregory Nazianzen; of many original works, chiefly relating to the Holy Scriptures; and of "Canonical Anſwers" to queſtions propoſed by a certain biſhop, named Conſtantine, which John Leunclavius publiſhed in Greek and Latin.

NICETERIA Athenas, Νικητηρια Αθηνας, in *Antiquity*, an Athenian ſolemnity in memory of Minerva's victory over Neptune, when they contended which of them ſhould have the honour of giving a name to the city afterwards called Athens.

NICHABURG, in *Geography*, a town of Perſia, in Khoraſan, famous for a mine of turquoiſe ſtones in its neighbourhood; 30 miles S. of Meſchid.

NICHE, in *Architecture*, a cavity, or hollow place, in the thickneſs of a wall, to place a figure or ſtatue in.

The word comes from the Italian *nicchia*, *ſhell*; becauſe the ſtatue is here incloſed in a ſhell; or, perhaps by reaſon of the ſhell with which the tops of ſome of them are adorned.

Niches are made to partake of all the ſegments under a ſemicircle. They are ſometimes at an equal diſtance from the front, and are parallel or ſquare on the back with the front line; in which caſe they are called ſquare receſſes, or ſquare niches.

The larger niches ſerve for groups of figures; the ſmall ones for ſingle ſtatues, and ſometimes only for buſts.

Great care muſt be taken to proportion the niches to the figures; and that the pedeſtal of the figures be proportioned to the niches.

Niches are ſometimes made with ruſtic-work.

Niche, *Angular*, that formed in the corner of the building.

Niche, *Cul de four of a.* See Cul.

Niche, *Ground*, that which, inſtead of bearing on a maſſive, has its riſe from the ground; as the niches of the portico of the Pantheon at Rome. Their ordinary proportion is to be two diameters in height, and one in width.

Niche, *Round*, is that whoſe plan and circumference are circular.

Niche, *Square*, that where they are ſquare.

Niched Column. See Column.

NICHILIANISTÆ, in *Church Hiſtory*, heretics who maintained that Chriſt had no being.

NICHILS. See Nihils.

Nichils, *Clerk of the.* See Clerk.

NICHOLAS I., pope, in *Biography*, called the Great, a native of Rome, the ſon of one Theodore, was ordained ſub-deacon by pope Sergius II., and deacon of the Roman church by pope Leo IV. So high was the reputation which he acquired in theſe offices, that upon the death of pope Benedict III. in 858, he was elected to fill the vacant dignity. When the emperor Lewis II., who had lately left Rome, heard of this event, he returned to that city, and aſſiſted in perſon at the coronation of the new

pontiff. Some days afterwards, being told that the pope, attended by the Roman nobility, was coming to viſit him, he went out to meet him, and after diſmounting took hold of the pope's bridle, and condeſcended to lead his horſe for ſome diſtance on foot, as he did alſo at the pope's departure. One of the firſt objects of importance which engaged the attention of the new pope, was the ſtate of affairs at Conſtantinople, which had divided the eaſtern biſhops into two parties, and ſeemed to furniſh him with a favourable opportunity of exerciſing his power and authority over that rival ſee. The emperor Michael, incenſed againſt the patriarch Ignatius, on not finding him ſufficiently obſequious to his pleaſure, commanded him to be driven from his ſee, declared lawfully depoſed, and ſent into exile. At the ſame time Photius, who was univerſally regarded as a man of extraordinary abilities, and as the rival of the ancients themſelves in every branch of literature, was elected his ſucceſſor, and as he was at that time a layman, he was hurried through the eccleſiaſtical degrees required by the canons, and conſecrated in ſix days. Theſe events occaſioned no little diſturbance in the eaſtern churches, ſome of them adhering to Ignatius, and others as warmly attached to Photius. At a council of biſhops held at Conſtantinople in the year 860, Ignatius was declared unworthy of the patriarchal dignity, and accordingly depoſed and excommunicated. By an oppoſite party, Photius met with a ſimilar treatment. Finding the biſhops thus divided, Photius applied to the pope to procure an approbation of his election. It is not compatible with the limits aſſigned to articles of this ſort, to enter at large into this controverſy, but we may briefly obſerve, that in a council held at Rome in 863, pope Nicholas excommunicated Photius, who had ſupplanted Ignatius in the ſee of Conſtantinople, as an uſurper. When information of this procedure was brought to the emperor Michael, he ſent a letter to his holineſs, filled with the ſevereſt reproaches and menaces, to which Nicholas returned a long reply, conſiſting of anſwers to the various articles, or blaſphemies againſt God and St. Peter, contained in it. All intercourſe from this time was broken off between Conſtantinople and Rome, and Photius propoſed to the emperor the aſſembling of a council at Conſtantinople for the purpoſe of depoſing Nicholas. This was agreed to; a council was convened, and before this aſſembly the pope was arraigned of innumerable crimes, and being pronounced guilty, was ſolemnly depoſed as altogether unworthy of the epiſcopal dignity, and it excommunicated all thoſe who ſhould venture to communicate with him. Photius alſo wrote a circular letter to the patriarchs and biſhops of the Eaſt, charging the Roman church with ſeveral erroneous doctrines, and various practices repugnant to the canons of the univerſal church, and exhorting them to concur with him for the purpoſe of reforming that corrupted church. The taſk of anſwering theſe charges Nicholas devolved on Hincmar and the Gallican biſhops, but, in the mean time, a change of affairs in church and ſtate took place, in conſequence of the murder of the emperor Michael, and Baſil's becoming head of the empire. For on the very next day after this event, Baſil ordered Photius to be depoſed and confined in a monaſtery, and then ſending for Ignatius, he reinſtated him in the patriarchal dignity. Of this important change an account was immediately ſent to Rome, but Nicholas did not live long enough to enjoy the ſatisfaction which the tidings of it would have afforded him. He died in the year 867, after he had preſided over the Roman church nine years and a half. He was reckoned a perſon of conſiderable abilities and learning, and particularly excelled as a canoniſt. By ſome writers he has been compared with Leo I. and Gregory I., (ſee their articles,) and pronounced worthy with them of the ſurname of GREAT. He is commended by Anaſtaſius for his charity to the poor, and for the magnificent preſents which he made to the churches of Rome, particularly to that of St. Peter. The public works of his pontificate, were the repairing of an aqueduct which conveyed water to the Vatican baſilic, and the rebuilding of the city of Oſtia, which was ſtrengthened with new works, to reſiſt the ſudden attacks of the Saracens. About a hundred of his letters have reached our times, which are inſerted in the eighth volume of the Collect. Conciliorum; they have been likewiſe publiſhed ſeparately at Rome.

NICHOLAS II., pope, whoſe original name was Gerard, was a native of Burgundy, became biſhop of Florence; and in January 1059 he was raiſed to the pontificate, when he took the name of Nicholas II. Previouſly to this, John Mincius had aſpired to the papal throne under the title of Benedict X., but finding himſelf too weak to diſpute the claims of Nicholas, he threw himſelf at his feet, entreated his forgiveneſs, and proteſted that he had been compelled to accept the dignity which he now moſt readily laid aſide. Nicholas accordingly abſolved him from all guilt, but diveſted him of his eccleſiaſtical functions, and obliged him to ſpend the remainder of his days in the church of St. Mary at Rome, where he was admitted only to lay-communion. In the firſt year of the pontificate, Nicholas convened a council, to which all the biſhops of Italy, France, and Germany were invited, in order to take into conſideration the beſt means for ſuppreſſing the opinions of the famous Berenger relating to the Euchariſt. (See the article BERENGER.) By the ſame council, a decree was paſſed concerning the election of the pope, confining it to the cardinals, and only leaving to the people, the clergy, and to the emperor, the power of confirming the election which they had made. Several canons were alſo made in it againſt ſimony, inceſtuous marriages of prieſts, and various abuſes, which preceding popes had endeavoured, in vain, to extirpate. During the ſame year in which this council was held, the pope ſent Peter Damian, cardinal biſhop of Oſtia, and Anſelm, biſhop of Lucca, with the character of his legates, to aſſiſt Guido, archbiſhop of Milan, in correcting ſeveral abuſes which prevailed in that church, and a few days after the council broke up he ſet out for Melfi, the capital of Apulia, where he preſided in perſon, at a council which paſſed many ſevere laws for the ſame purpoſe. While he was at Melfi, he received an embaſſy from the famous Robert Guiſcard, the Norman, who had made himſelf maſter of the whole of Apulia, and ſpread his conqueſts over the greateſt part of Calabria. After a few conferences, it was agreed between them, that the pope ſhould abſolve the Normans from the excommunication which they had incurred, and confirm to Robert and his heirs the dukedoms of Apulia and Calabria, which he had conquered from the Greeks, and alſo the iſland of Sicily, after he ſhould expel the Greeks and Saracens out of it. It was alſo agreed, that the pope ſhould confirm to Richard of Averſa, and his heirs, the city and principality of Capua, out of which he had lately driven the lawful prince. On the other hand, Robert and Richard agreed to acknowledge themſelves vaſſals of the apoſtolic ſee, to ſwear an inviolable allegiance to pope Nicholas and his ſucceſſors, and to pay yearly tribute as a mark of their ſubjection. From Melfi the pope proceeded to Beneventum, where he held another council, and he then ſet out on his return to Rome, attended with a numerous body of Normans, who obliged the inhabitants of Prænеſte, Tuſculum, and Nomentum, to ſubmit to the Roman ſee, from which they had revolted; and theſe warriors alſo deſtroyed the ſtrong holds,

and

and put an end to the power of the many petty tyrants that ſurrounded the city of Rome on all ſides. In the year 1060, Nicholas ſent Stephen, cardinal prieſt, into France, as his legate, to reform the abuſes which prevailed in the Gallican church, and had been connived at by the biſhops in thoſe parts. In the following year Nicholas held a council in the Lateran palace, at which were preſent Aldred, archbiſhop of York, and the biſhops elect of Wells and Hereford. Aldred had made a journey to Rome, that he might receive the pall at the pope's hands, who refuſed to grant it, but upon the condition that Aldred ſhould reſign the ſee of Worceſter, which he was deſirous of retaining with the higher preferment. When this council broke up, Nicholas went to Florence, where he died the ſame year, after a ſhort pontificate of two years and a half. He is deſcribed by cardinal Damian as a man of learning, of a very lively genius, and of a great reſolution in the purſuit of any undertaking on which he had determined. He ſays, he was chaſte beyond ſuſpicion, and that his benevolence knew no bounds. Nine of his letters are ſtill extant; one of which is directed to Edward the Confeſſor, king of England, and contains a confirmation of the privileges granted to the church of Weſtminſter, and the reſt chiefly relate to the eccleſiaſtical affairs of France. They are inſerted in the ninth vol. of the Collect. Conciliorum.

Nicholas III., pope, whoſe family name was John Cajetan, was a native of Rome, and deſcended from a branch of the noble family of the Urſini. He was elected to the papacy in November 1277, and immediately after his election he repaired to Rome, in order to be ordained, and, upon his being crowned, he took the name of Nicholas, from the ſaint who gave the title to his cardinalate. Before his coronation he wrote to Rudolph, in order, if poſſible, to prevent the war which threatened to break out between him, and Charles king of Sicily. He hoped to perſuade the emperor to ſuſpend his intended march into Italy, and to refer the ſubject in diſpute to the judgment of the apoſtolic ſee. In the year 1278, ambaſſadors arrived at Rome from the Greek emperor Michael Palæologus, and his ſon Andronicus, to confirm the union agreed upon at the council of Lyons between the Greek and Latin churches. On this occaſion, Nicholas received them in the moſt honourable manner, and they ſwore to all the articles which were ſubſcribed by the former ambaſſadors. In the ſame year, Rudolph confirmed to the popes all the grants made, or which were pretended to have been made, by former emperors and the apoſtolic ſee: he alſo obtained the concurrence of all the electors of the empire to his diploma of confirmation. In return for this liberality, the pope obliged the king of Sicily to reſign his vicariate of Tuſcany, declaring that the office was annulled by the lawful election of Rudolph to the dignity of king of the Romans. By depriving Charles of his power in Tuſcany, Nicholas not only rendered an acceptable ſervice to the emperor, but alſo gratified the hatred which he had conceived to the king of Sicily. After this he obliged Charles to reſign the dignity of ſenator of Rome, conferred upon him by pope Clement IV., and then iſſued a bull, forbidding any emperor, king, prince, duke, marquis, count, or baron, &c. from being elected hereafter to that office. The ſame bull ordained that the ſenatorial dignity ſhould not be conferred on any perſon for life, but only for one year; at the end of which another ſhould be choſen, unleſs the pontiff for the time being thought fit to continue the former in his dignity. But, notwithſtanding this bull, Nicholas got the Romans to chooſe him ſenator for life. So far was he carried by his hatred to king Charles, that he became a party in projecting that barbarous conſpiracy formed by John of Procida, and Peter, king of Arragon, to drive Charles out of the iſland, which is known by the name of the "Sicilian Veſpers." Before this conſpiracy was ripe for execution, he died at Suriano, near Viterbo, in the year 1280, after a pontificate of two years, and almoſt nine months. He is praiſed on account of his excellent moral qualities; for his liberality to the poor, and the encouragement of learning and learned men; but he carried the practice of nepotiſm to an extravagant exceſs, beſtowing all the beſt and moſt lucrative employments upon his own relations. He granted many privileges to the religious orders, particularly to the Franciſcans, and in the year 1279, publiſhed that famous bull, called "The Conſtitution Exiit," from the firſt word in it, which confirmed the rule of St. Francis, and contained an accurate and elaborate explication of the maxims it recommended, and the duties it preſcribed. By this edict, the pontiff renewed that part of the rule which prohibited all kinds of property among the Franciſcans, every thing that bore the leaſt reſemblance of a legal poſſeſſion, or a fixed domain; but he granted them the uſe of things neceſſary, ſuch as houſes, books, and other conveniences of that nature, the property of which, in conformity with the appointment of Innocent IV., was to reſide in the church of Rome. To Nicholas III. is attributed a treatiſe "De Electione Dignitatum;" and five of his "Letters" are given in Wadingi Annal. Minor.

Nicholas IV., pope, formerly known by the name of Jerome Aſcoli, deſcended from humble parents, was born at the town whence he took his ſurname, ſituated in the marche of Ancona. He entered, at an early age, into the order of Minorites, and acquired ſuch reputation by his learning and exemplary life, that he was raiſed to the poſt of general of the fraternity. Before he had attained to this honour, pope Gregory X. ſent him on a miſſion to Conſtantinople, for the purpoſe of bringing about a reconciliation and union between the Greek and Latin churches, and from thence into Tartary, to promote the converſion of infidels. Afterwards he was created cardinal by pope Nicholas III., by whom, and by Honorius IV., he was employed on various miſſions. By Martin IV. he was preferred to the biſhopric of Paleſtrina, and on the death of Honorius IV. he was raiſed to the high dignity of pope. At his coronation, out of gratitude to Nicholas III., who had created him a member of the ſacred college, he took the name Nicholas IV. Soon after his election he intereſted himſelf with great zeal in the cauſe of Charles, prince of Salerno, who was kept priſoner by Alphonſus, king of Arragon, and he ſent legates to that monarch to treat about the prince's liberty, and alſo to ſummon Alphonſus to appear at Rome within a limited time. Alphonſus made his peace, but dying almoſt immediately afterwards, his brother James, who ſucceeded him, refuſed to ratify the treaty. At length, in 1292, Nicholas, finding that he paid no regard to his repeated admonitions to ſurrender the iſland of Sicily to Charles, ſolemnly excommunicated him, and all the Sicilians who adhered to him. The pope was equally zealous in eccleſiaſtical affairs as in political. Beſides maintaining the pretenſions and privileges of the church with the moſt reſolute zeal, and, indeed, obſtinate perſeverance, he diſpatched miſſionaries to propagate the Catholic faith among the Sclavonians, the Tartars, the Armenians, and othern Eaſtern nations, and he addreſſed letters in defence of it to the emperor of Ethiopia. But the object which ſeemed to occupy his attention more than every thing elſe, was the deſperate ſtate of the Chriſtians in the Eaſt, who were now reduced to the greateſt extremities of weakneſs and

and misery. Tripoli was taken in 1289, and all the inhabitants put to the sword, or carried into captivity. Ptolemais shared the same fate, which so alarmed the inhabitants of Tyre, Sidon, and the other cities in Syria, that they transported themselves to the island of Cyprus. Thus was the Holy Land irrecoverably lost, nothing being left to the Christians of the East but this island and the Lesser Armenia. Nicholas, to repair these losses, endeavoured to set on foot a general crusade. His efforts were vain, and he felt so much mortification at the loss of Palestine, that it was thought greatly to contribute to hasten his death, which took place in April, 1292, after he had presided little more than four years over the Roman church. He is highly commended by contemporary writers for his humility, good temper, and contempt of all worldly grandeur. He was a man of learning, and encouraged learning in others. On a magnificent mausoleum which pope Sixtus V. erected to his memory, it is recorded to his praise, that men of probity and men of learning were his only relations. He was author of "Commentaries" on some parts of the Scriptures, and of several "Sermons." His "Constitutio pro Benedictinis" was published at Paris in 1519. Some of his "Letters" have been published in the "Annales" of Bzovius, and Wadingus.

Nicholas V., pope, originally known by the name of Thomas of Sarzana, was the son of a physician at Sarzana, a small town on the borders of Tuscany, and the republic of Genoa, whence he derived his surname. His promising talents and early love of learning attracted the notice of cardinal Nicholas Albergati, who took him under his protection, and supplied him with whatever was necessary for pursuing his studies at the university of Bologna. Here he applied to the different branches of academical learning with extraordinary diligence and success, and acquired the character of being one of the most learned divines and able disputants of his time. Being introduced to the court of Eugenius IV., he recommended himself to the good opinion and esteem of that pontiff, who employed him in all the disputes between the Latins and Greeks at the councils of Ferrara and Florence. On these occasions he acquitted himself very ably as a scholar, divine, and man of prudence, and his merits were rewarded, in the year 1445, by his promotion to the bishopric of Bologna. In 1446 he was promoted to the purple, and in the following year he was elevated to the papal throne by the unanimous voice of the cardinals met to choose a successor to Eugenius IV. The coronation of the new pope took place on the 19th of March, when he assumed the name of Nicholas, out of gratitude to Nicholas Albergati. Immediately after his elevation to the papal dignity, he sent notice of the event to all the Christian princes, acknowledging himself to be quite unworthy of the high honour to which he had been raised, he said, against his will, and from which he was ready to retire, if such resignation was thought necessary or expedient for the good of the church. It was during the pontificate of Nicholas that the sixth jubilee was celebrated at Rome, and though the city was crowded with pilgrims during the whole year, yet, by the prudent regulations of the pope, they were furnished with all necessary supplies upon reasonable terms, and all disorders and quarrels were prevented. It was, however, at this festival that an accident happened which gave him great concern. As the crowd one day was passing over the bridge of St. Angelo, it broke down, by which more than two hundred persons were either drowned or trampled to death. In the year 1453, Nicholas received intelligence of the capture of Constantinople by Mahomet II. Some historians mention this fact as the greatest affliction that befel the pope, but Gibbon, speaking on the subject, says, "Some states were too weak, and others too remote: by some the danger was considered as imaginary, by others as inevitable: the western princes were involved in their endless and domestic quarrels; and the Roman pontiff was exasperated by the falsehood or obstinacy of the Greeks. Instead of employing in their favour the arms and treasures of Italy, Nicholas V. had foretold their approaching ruin, and his honour seemed engaged in the accomplishment of his prophecy. Perhaps he was softened by the last extremity of their distress, but his compassion was tardy: his efforts were faint and unavailing; and Constantinople had fallen before the squadrons of Genoa and Venice could sail from their harbours." From this time he spent the remainder of his pontificate in endeavours to allay the civil wars and commotions which took place in Italy, to reconcile the Christian princes who were then at war with one another, and to unite them in one league against the enemies of the Christian church. In his efforts he was completely unsuccessful, and the disappointment is said to have hastened his death, which happened in 1455, after he had completed the eighth year of his pontificate. "The fame of Nicholas V.," says the author just quoted, "has not been adequate to his merits. From a plebeian origin, he raised himself by his virtue and learning: the character of the man prevailed over the interest of the pope; and he sharpened those weapons which were soon pointed against the Roman church. He had been the friend of the most eminent scholars of the age: he became their patron; and such was the humility of his manners, that the change was scarcely discernible either to them or to himself. If he pressed the acceptance of a liberal gift, it was not as the measure of desert, but as the proof of benevolence: and when modest merit declined his bounty, "accept it," he would say, with a consciousness of his own worth, "you will not always have a Nicholas among you." The influence of the holy see pervaded Christendom; and he exerted that influence in the search, not of benefices, but of books. From the ruins of the Byzantine libraries; from the darkest monasteries of Germany and Britain, he collected the dusty manuscripts of the writers of antiquity; and wherever the original could not be removed, a faithful copy was transcribed, and transmitted for use. The Vatican, the old repository for bulls and legends, for superstition and forgery, was daily replenished with more precious furniture; and such was the industry of Nicholas, that in a reign of eight years he formed a library of 5000 volumes. To his munificence the Latin world was indebted for the versions of Xenophon, Diodorus, Polybius, Thucydides, Herodotus, and Appian; of Strabo's Geography; of the Iliad; of the most valuable works of Plato and Aristotle; of Ptolemy and Theophrastus, and of the fathers of the Greek church. The authorities of the foregoing articles of the popes Nicholas are Gibbon; Bower's Hist. of the Popes; and Moreri.

Nicholas, Eymericus, a famous Spanish inquisitor, was born at Girone, in Catalonia, about the year 1320. He embraced the monastic life in the order of St. Dominic, and, after distinguishing himself as a preaching friar, was made inquisitor-general of the kingdom of Arragon in the year 1356, by pope Innocent VI. In the year 1371 he came to Avignon, and was created his chaplain and judge of heresies by pope Gregory XI. He died at Girone in 1393, having held the post of inquisitor-general during nearly forty-four years, and when he was about eighty years of age. He was author of an extraordinary work, entitled "Directorium Inquisitorum," divided into three parts. The *first* part treats concerning articles of faith; the

the *fecond* reſpecting the puniſhment of heretics: of thoſe who are ſubject to the juriſdiction of the Inquiſition, and of ſuch crimes as are beyond its cognizance: the *third* part deſcribes the manner of carrying on the proceſſes before the tribunals of the holy office. It was firſt printed in the year 1503, at Barcelona, and afterwards at Rome in 1578, with the corrections and commentaries of Francis de Penna, ſince which time it has gone through ſeveral editions. Limborch made much uſe of it in writing his "Hiſtory of the Inquiſition," and it juſtifies that author in the darkeſt ſhades which he has given of that horrid tribunal, which, fortunately for mankind, is now for ever aboliſhed from the face of the earth.

NICHOLAS, in *Geography*, a county of Kentucky, containing 2863 inhabitants.

NICHOLAS, *Cape St.*, the N.W. extremity of the iſland of St. Domingo, in the Weſt Indies, W. of the town of its name, more commonly called "The Mole."

NICHOLAS, *Port St.*, lies on the coaſt of Peru, ſix leagues S.S.E. of Port Cavallo.

NICHOLAS *Iſland*, a ſmall iſland on the N. coaſt of the iſland of Cuba. N. lat. 23° 15'. W. long. 79° 40'.

NICHOLAS *Point*, a cape on the N. coaſt of the iſland of Java. S. lat. 5° 51'. E. long. 105° 54'.

NICHOLASVILLE, the county town of Nicholas county, in Kentucky; 12 miles S.E. of Lexington. It has a court-houſe, and a few dwelling houſes.

NICHOLS, FRANK, in *Biography*, a phyſician and anatomiſt of eminence, was born in London in the year 1699, where his father was a barriſter. After receiving the rudiments of his education at a private ſchool in the country, he was ſent to Weſtminſter, and thence to Oxford, where he was admitted a commoner of Exeter college in 1714. He applied himſelf to the uſual academical exerciſes with great aſſiduity, and chooſing medicine for his profeſſion, commenced a courſe of diſſections, which he purſued with much diligence and perſeverance, ſo as to render himſelf perfectly maſter of this branch of his art. Hence he was choſen reader of anatomy in the univerſity, where he uſed his utmoſt endeavours to introduce a zeal for this neglected ſtudy, and obtained a high and well merited reputation. His reſidence at Oxford, however, was only temporary; for at the cloſe of his courſe he returned to London, where he had determined to ſettle, after having made a ſhort trial of practice in Cornwall, and a ſubſequent viſit to the principal ſchools of France and Italy. On his return to England, he reſumed his anatomical and phyſiological lectures in London, and they were frequented, not only by ſtudents from both the univerſities, but by many ſurgeons, apothecaries, and others. His reputation rapidly extended, and in the year 1728 he was elected a fellow of the Royal Society, to which he communicated ſeveral papers, which were publiſhed in the Philoſophical Tranſactions, eſpecially ſome obſervations on the nature of aneuriſms, in which he controverted the opinion of Dr. Freind; and a deſcription of a ſingular diſeaſe, in which the pulmonary vein was coughed up. In the year 1729, he received the degree of M.D. at Oxford, and became a fellow of the College of Phyſicians in 1732. In 1734 he was appointed to read the Gulſtonian lectures at the college, and choſe the ſtructure of the heart and the circulation of the blood for his ſubjects. At the requeſt of the preſident, Dr. Nichols again read the Gulſtonian lectures in 1736, chooſing for his topics the urinary organs, and the nature and treatment of calculous diſeaſes; and in 1739, he delivered the anniverſary Harveian oration. In 1743, he married one of the daughters of the celebrated Dr. Mead.

Dr. Nichols was appointed lecturer on ſurgery to the College in 1748, and began his courſe with a learned and elegant diſſertation on the "Anima Medica," which was publiſhed as a ſeparate work in 1750. While he was proceeding with his courſe, however, he received what he conſidered an inſult from the College, who choſe a junior fellow as an elect, on the death of Dr. Conngham, in preference to him, without any apparent reaſon; and he indignantly reſigned his lectureſhip, never afterwards attending the meetings of the fellows, except when matters of the utmoſt importance were in agitation. In 1751 he took ſome revenge in an anonymous pamphlet, entitled "The Petition of the unborn Babes to the Cenſors of the Royal College of Phyſicians in London," in which Dr. Neſbitt, Dr. Maule, Dr. Barrowby principally, and ſir William Browne, ſir Edward Hulſe, and the Scots, were the objects of his ſatire.

On the death of ſir Hans Sloane, in 1753, Dr. Nichols was appointed his ſucceſſor as one of the king's phyſicians; an office which he held till the death of his majeſty in 1760. An offer of a penſion was made to him, if he would have aſked for it, but he rejected it with diſdain. In 1772 he publiſhed a ſecond edition of his treatiſe "De Animâ Medicâ," to which was ſubjoined a diſſertation "De Motu Cordis et Sanguinis in Homine nato et non nato," inſcribed to his learned friend and coadjutor the late Dr. Lawrence.

Weary at length with his profeſſion, and with a reſidence in London, and alſo wiſhing to ſuperintend the education of his ſon at Oxford, he removed to that city, where he had ſpent ſome of the moſt agreeable years of his youth. But when the ſtudy of the law recalled his ſon to London, the doctor took a houſe at Epſom, where he paſſed the remainder of his life in a literary retirement, varying his recreations by an attention to the recent botanical reſearches of Linnæus, and by ſome agricultural inquiries. His conſtitution had never been robuſt; he was conſtantly ſubject to ſevere catarrhal affections, and an aſthmatic cough, which, returning with great violence in January 1778, deprived the world of this valuable man, in the eightieth year of his age. Gent. Mag. for 1778. Hutchinſon, Biograph. Med.

NICHOMACHUS, one of the ſeven Greek writers on muſic that have been preſerved, and collected and publiſhed by Meibomius, who ſuppoſes him to have flouriſhed in the time of Auguſtus. He is the only Greek theoriſt of the Pythagorean ſect whoſe writings are come down to us. He was cloſely followed by Boethius, as may be ſeen in his fifth chapter De Muſica. The treatiſe of Nichomachus is called a Manual, and divided into two books. In the firſt he treats of the elements of harmony (by which the ancients meant melody, or muſical intervals fit for ſong or melody); of the two kinds of human voice, that of ſpeech, and that of ſong; of the muſic of the ſpheres, or harmonical proportions in the diſtances, magnitude, and motion of the heavenly bodies; of the expreſſion of ſounds by the ratio of numbers; of the ſeven ſtrings of the ancient lyre, to which Pythagoras added an eighth, or the octave; how the ratio of arithmetical ſounds was invented; of the diapaſon, or octave, in the diatonic genus; of the diviſion of the ſcale by Timæus Philolaus; of the biſdiapaſon, or double octave in the diatonic genus; and of the progreſſion and diviſion of ſounds in the three genera. The ſecond book contains a ſketch of the hiſtory of muſical inventions, of the lyre by Mercury, of Orpheus, Linus, and Terpander, &c. names and ratios of muſical ſounds in the three genera.

NICHOUAN, in *Geography*, a town of Perſia, in the province of Irak; 20 miles E.N.E. of Conſar.

NICIAS, in *Biography*, an Athenian of conſiderable

note, was the ſon of Niceratus, and inherited very large property, of which a great part conſiſted in the ſilver mines at Laurium. By the influence of his wealth he attained to conſequence in the ſtate, even during the life of Pericles; and after the death of that great man, he became one of the heads of the Athenian government. In the Peloponneſian war he had the command againſt the Lacedæmonians at Sphacteria; and being upbraided by Cleon for want of ſucceſs, he propoſed to that demagogue to take his place. He conſented, and though he was wholly ignorant of military affairs, he made up in zeal and energy what he was deficient in with regard to experience, and completely effected the purpoſe which he had propoſed. In 423 B.C. Nicias commanded in an expedition for the reduction of the iſland Cythera, in which he was ſucceſsful, but though he gained much reputation by the tranſactions in which he engaged, yet he was perpetually endeavouring to reſtore peace, which, after the death of Cleon and Braſidas in battle, he performed, and a treaty, for a term of fifty years, between the Athenians and Lacedæmonians, with a league offenſive and defenſive, was ſigned B.C. 421. Alcibiades was now riſing into public eſtimation, and ſeemingly bent upon embroiling the affairs of Greece, in order to give himſelf ſcope for action. General tranquillity had not been reſtored by the peace of Nicias; a renewal of the Peloponneſian war followed, and the people of Athens determined to ſend a powerful force into Sicily, in order to aſſiſt the Egeſtines in their war with the Syracuſans. Nicias, notwithſtanding his oppoſition to this raſh meaſure, was appointed one of the generals, in conjunction with Alcibiades and Larnachus; and the expedition ſet ſail in the year 415 B.C. The Athenian troops landed in Sicily, and poſſeſſed themſelves of ſeveral towns, and Alcibiades being recalled, Nicias and Larnachus took a ſtrong poſt in the neighbourhood of Syracuſe. The ſiege of that city commenced in the next campaign, and Nicias, after ſome ſucceſsful actions, drew a line of circumvallation quite round it. The proſpect of ſucceſs, which, for a moment, ſeemed to open upon him, was clouded by the arrival of freſh ſupplies, and large reinforcements from Corinth. Larnachus being ſlain, two new generals, Eurymedon and Demoſthenes, were appointed, and the former was ſent from Athens with a ſupply of money, and an aſſurance to Nicias of a ſpeedy ſuccour. (See SYRACUSE.) Nicias conſtantly recommended cautious meaſures, and when Demoſthenes, who arrived with a large reinforcement, propoſed an immediate aſſault upon the city, he argued ſtrongly againſt ſuch a hazard. He was, however, out-voted in the council of war, and the attempt was made, which was defeated, to the great loſs of the Athenians. Demoſthenes was ſo much diſheartened by the reſult, that he adviſed inſtantly raiſing the ſiege, and returning to Athens. But Nicias declared, that he would rather die before the place than abandon an enterpriſe which might ſtill ſucceed, and expoſe himſelf to an ignominious condemnation from his countrymen. The aſpect of affairs ſoon became ſtill more gloomy; the Syracuſans received powerful ſuccours, and, what was much more alarming, a peſtilential diſeaſe broke out in the Athenian camp, which daily thinned their numbers. Nicias now thought ſeriouſly of retreating, and every thing was prepared for embarkation. As the Syracuſans had no ſuſpicions of this deſign, it might have been eaſily effected, when, juſt at the moment, an eclipſe of the moon took place. The ſuperſtition of Nicias was alarmed, and he refuſed to go on board the veſſel till he had conſulted the ſoothſayers. Theſe, willing to appear wiſe, directed that the departure ſhould be delayed thrice nine days, and thus the only opportunity of eſcape was loſt. The enemy attacked the Athenians by ſea and land; deſtroyed a number of their ſhips, and the reſidue were cloſely blocked up there; and nothing was left them but to make the beſt retreat they were able to ſome friendly Sicilian ſtate. "By falſe intelligence," ſays the hiſtorian, "Nicias was prevented from commencing his march when it might have been ſafe; and when want of proviſions at length compelled him to leave his camp, the paſſes were already blocked up. There could not be a ſcene of deeper diſtreſs than at the moment when the army commenced its march, abandoning, not only all its baggage, but the ſick and wounded, who clung round their comrades, and appealed to the gods and men againſt the cruelty of leaving them to a mercileſs foe. Nicias himſelf was the moſt melancholy figure in the group; worn down by diſeaſe and anxiety, pale and ſqualid, he ſeemed to centre in himſelf the afflictions of the whole. His mind, however, was entire, he bore up againſt deſpondency, and he exerted every effort to inſpire courage in his men, and to make them preſerve that order which alone could enſure to them ſafety. As they proceeded, they were continually haraſſed by the cavalry and light troops of the enemy, and expoſed to the want of every neceſſary. Many were cut off, and at length Demoſthenes with the whole rear-guard was forced to ſurrender. Nicias with the van arrived exhauſted at the river Aſinarus, and while they were croſſing it, and quenching their extreme thirſt, the Syracuſan cavalry riding among them made great ſlaughter, without meeting with the ſlighteſt reſiſtance." The greater part was killed, Nicias and a ſmall body ſurrendered, upon condition that the ſlaughter ſhould ceaſe. The Syracuſans, after a day of triumph, aſſembled to determine the fate of their captives, and they reſolved to put the generals, at leaſt, to death. Nicias and Demoſthenes, being informed of the determination, prevented it by a voluntary termination of their lives. This terrible diſaſter happened in the year 413 B.C. Nicias appears to have been a man of virtue, and a ſincere lover of his country; he was religious to the borders of ſuperſtition, and perpetually conſulted diviners on his own affairs, and thoſe of the ſtate. His manners were mild, and his principles were humane and pacific. Univer. Hiſt.

NICKAJACK, in *Geography*, an Indian town on the S.E. ſide of Tenneſſee river, at the point of a large bend, about 36 miles N.E. of the Creeks' croſſing places.

NICKEL, in *Chemiſtry*, a ſimple ſubſtance, and a metal of a white colour. When obtained perfectly pure it is malleable. Its luſtre is agreeable, and at ſome period it may become of importance in the arts, and in domeſtic economy.

*Aſſay and Analyſis of Nickel.*—This metal is generally obtained from a mineral of a reddiſh-brown colour, frequently ſpotted with green, found plentifully in different parts of Germany. This ore was formerly thought to be copper ore, from its green ſpots, but in conſequence of its affording no copper, it obtained the name of *kupfer nickel*, which means falſe copper. This mineral chiefly conſiſts of nickel and ſulphur, but contains more or leſs of arſenic, cobalt, and iron. The firſt experiments to aſcertain the nature of this mineral were by Cronſtedt in 1751, who was of opinion that he had obtained a peculiar metal from it, to which he gave the name of nickel. What he procured, however, was not pure nickel, in conſequence of which the authority of this chemiſt was doubted by Sage and Monnet. This point was at laſt finally ſettled by Bergman, who proved it to be a new metal. The experiments were publiſhed in 1775. The purification of this metal has been ſince carried to a greater extent by different chemiſts. The following is the moſt approved proceſs for obtaining the oxyd of this metal in a ſtate of purity, from which the metal is afterwards eaſily obtained.

After the ore above-mentioned has been roaſted with charcoal, which may probably expel ſome of the arſenic, it muſt be reduced to a fine powder, and treated with nitric acid. The remaining ſulphur will be ſeparated, or, with the arſenic, converted into ſulphuric and arſenic acids. If to a ſolution nitrat of lead be added, theſe acids will be precipitated by the lead in the ſtate of ſulphat and arſeniat of lead. If too much nitrat of lead be added, the lead may be precipitated by adding ſmall portions of ſulphuric or rather ſulphat of ſoda, till no more precipitates take place. The ſolution now contains nickel, iron, and perhaps cobalt and copper. The copper may be ſeparated by a clean bar of iron. The ſolution muſt now be treated with carbonat of potaſh, by which the three oxyds will be precipitated together. Theſe being waſhed, the nickel and cobalt may be diſſolved in pure ammonia, while the oxyd of iron will be left behind. This ammoniacal ſolution is next heated, till the ammonia is driven off, which is known by its ceaſing to tinge turmeric paper brown. If to theſe oxyds pure potaſh be added, the oxyd of cobalt will be diſſolved, while that of nickel will be left in a ſtate of purity. The oxyd of nickel is now to be made into a paſte with oil or fat, and introduced into a crucible, with ſome black flux. The crucible ſhould be lined with charcoal, and provided with a cloſe cover; the whole muſt be heated ſtrongly in a ſmith's forge for more than an hour. On cooling a button of pure nickel will be found.

This metal, as has been remarked, is of an agreeable white colour, poſſeſſing conſiderable hardneſs and luſtre. Its ſpecific gravity is about 8.3, which increaſes with hammering. It is ſaid to be capable of being hammered into ſheets not thinner than $\frac{1}{100}$dth of an inch. It is now generally believed to be magnetic, like iron. It does not fuſe at a temperature leſs than 160° of Wedgewood. It poſſeſſes the valuable property of not being changed by expoſure to the air, nor by immerſion in water, at the common temperature. When, however, it is expoſed to a tolerable heat, it becomes tarniſhed, and ultimately covered with oxyd. A much ſtronger heat ſets this oxygen free, as is the caſe with the noble metals.

The oxyds of nickel at preſent known are two, namely, the grey and the black. Chemiſts are at preſent divided in opinion whether the green oxyd be the firſt or ſecond oxyd. Dalton ſeems to be uncertain as to this point, the atom of oxygen being 7. And ſince the analyſis of Richter gives 78 of metal to 22 of oxygen, we ſhall have, conſidering the grey oxyd the firſt oxyd, $\frac{x}{7} = \frac{78}{22}$, and $x = \frac{78 \times 7}{22}$, $= 24.81$, the weight of the atom of nickel. If it be conſidered as the ſecond oxyd, then $\frac{x}{14} = \frac{78}{22}$, and $x = 49.62$, the weight of the atom of nickel. Theſe numbers are ſo near 25 and 50, that Dalton has given with doubt 25 or 50 for the atom of nickel. Sir Humphrey Davy thinks the grey oxyd the ſecond oxyd, from the number he gives for nickel agreeing alſo with the ſulphuret. We have, therefore, good ground for ſtating the weight of an atom of nickel at 50. From theſe data the firſt oxyd will conſiſt of 50 to 7, or in the 100, there is 87.7 nickel, and 12.3 oxygen. The ſecond, 50 to 14, or 100 will give 78.1 nickel, and 21.9 oxygen. The third, or black oxyd, will be 50 nickel to 21 oxygen, or in 100, there will be 70 of nickel, and 30 of oxygen.

The ſecond oxyd is obtained by diſſolving nickel in nitric acid, and precipitating the oxyd by means of potaſh. This precipitate is not the pure oxyd, but an hydrated oxyd, containing, according to ſir Humphrey Davy, $\frac{1}{4}$th its weight of water. When this hydrat is heated to ignition, the water is ſeparated, leaving the grey oxyd. When the oxymuriatic acid gas is paſſed through water mixed with the latter oxyd, it becomes converted into the black oxyd.

Nickel combines with ſulphur. We are indebted to Mr. E. Davy for the proportions of its combination with ſulphur, which he ſtates at 34 ſulphur to 66 nickel. This ſulphuret muſt be conſidered as 2 atoms of ſulphur, $2 \times 13$ to 1, of nickel, 50, for $\frac{50 + 26}{26} = \frac{100}{34.2}$, or 34.2 oxygen to 65.8 nickel. This very ſtrongly confirms the truth of the number 50 for the weight of the atom of this metal. From the ſame authority there appears to be another ſulphuret, formed by heating the grey oxyd with ſulphur, conſiſting of 56.5 nickel, and 43.5 oxygen. This will be $3 \times 13$ to 50, which gives 43.8 ſulphur, and 56.2 nickel. Nothing can be more ſatisfactory than this almoſt exact agreement between theory and practice. The firſt ſulphuret will be 13 to 50, or in 100, 20.6 ſulphur, and 79.4 nickel. According to the authority of Thenard, phoſphorus combines with nickel in the proportions of 17 phoſphorus to 83 of nickel. Theory would give the firſt phoſphuret 50 to 9, or *per cent.* 15.3 phoſphorus, and 84.7 nickel. The ſecond ſulphuret will be 50 to $2 \times 9$, or *per cent.* 73.5 nickel, and 26.5 phoſphorus. The combination of nickel with hydrogen, nitrogen, carbon, and the baſe of the boracic acid, is not known. It forms alloys with ſome of the metals, but theſe compounds have been little examined. Since nickel is a malleable metal, and difficult of fuſion, ſome fuſible alloy with it might be of importance. Its alloy with gold was tried by Mr. Hatchett in the proportions of 11 gold to 1 of nickel, which was brittle, and of the colour of braſs. Sir H. Davy ſpeaks highly of its alloy with iron: its colour approaches ſilver as the nickel prevails, while the malleability of the iron is not impaired. It is alſo leſs liable to ruſt than iron. The ſame author obſerves that iron in meteoric ſtones is alloyed with nickel from 1.5 to 17 *per cent.* of the latter.

*Salts of Nickel, or the Combination of its Oxyds with Acids.*—The few facts of which we are in poſſeſſion of combinations of this ſubſtance with acids, are not ſtrictly to be relied upon, from the circumſtance of the experiments being made upon impure nickel.

*Sulphat of Nickel.*—Sulphuric acid has little action upon nickel, but it diſſolves its oxyd, forming a ſalt, the ſolution of which is of a beautiful green colour. By evaporation it affords priſmatic cryſtals, which afterwards effloreſce and become opaque. The compoſition of this ſalt has not been aſcertained, but it may be inferred with ſome hope of truth, from the near coincidence of the other compounds of nickel with theory. The oxyd which unites with the acid is doubtleſs the grey; hence 34 + 50 + 14 will conſtitute the ſalt, or 34 acid to 64 oxyd. This will give *per cent.* 34.7 acid, and 65.3 of baſe.

*Nitrat of Nickel.*—Nitric acid oxydates and diſſolves nickel. The ſolution is of a green colour, and affords rhomboidal cryſtals. This ſalt is firſt deliqueſcent, and afterwards falls to powder, by loſing its acid, the atom of nitric acid being 19; and ſince the ſoluble nitrats moſtly contain two atoms of acid, it will be conſtituted by $2 \times 19$ acid to 64 of oxyd.

*Muriat of Nickel.*—The muriatic acid acts feebly upon nickel. With the aid of nitric acid, however, it becomes oxydated, and the muriatic acid diſſolves it, forming a green ſolution, which at firſt cryſtalliſes in the form of rhomboidal priſms. Theſe are ſoon acted upon by the air, and ulti-

mately loſe the acid, like the nitrat, the atom of muriatic acid being 22. This ſalt will conſiſt of 22 acid, and 64 of baſe.

*Phoſphat of Nickel.*—The phoſphoric acid takes up a very ſmall quantity of the oxyd of nickel, and hence is perhaps almoſt an inſoluble ſalt. Hence the beſt way of forming it will be by adding phoſphat of ſoda to nitrat of nickel. It will be formed by 23 of acid, and 64 baſe.

*Fluat of Nickel.*—This ſalt is ſoluble, and affords green cryſtals. It will conſiſt of 15 acid, and 64 baſe.

*Borat of Nickel.*—This ſalt is very little known. It may be formed by mixing borat of ſoda with nitrat of nickel.

*Carbonat of Nickel.*—This ſalt is mentioned by Bergman, who formed it by adding an alkaline carbonat to the nitrat of nickel. He found it to conſiſt of 56.4 acid and water, and 43.6 of baſe.

*Acetat of Nickel.*—Oxyd of nickel diſſolves in acetic acid, forming a ſoluble ſalt, which cryſtalliſes in a rhomboidal form, and of a green colour.

*Oxalat of Nickel.*—The oxalic acid ſlightly attacks nickel, with which it forms a green powder, from the ſalt being inſoluble. It ſhould be formed by adding oxalat of ſoda to a nitrat of nickel. The ſalt falls down in the form of green powder.

*Tartrat of Nickel* has not been examined.

*Arſeniat of Nickel.*—This is a ſoluble ſalt, but little known.

*Molybdat of Nickel.*—This ſalt is in the form of white powder, and probably inſoluble.

*Sulphat of Nickel and Potaſh.*—This is a triple ſalt, diſcovered by Prouſt. It is formed by adding potaſh to the ſulphat of nickel. By evaporation it eaſily cryſtalliſes in the form of priſms of a beautiful green colour. It has a ſweetiſh taſte.

*Sulphat of Nickel and Ammonia.*—Uſing ammonia as the potaſh is uſed in the laſt ſalt, forms a triple ſalt of a green colour, affording flat priſmatic cryſtals.

*Sulphat of Nickel and Iron.*—This ſalt is formed by adding nitrat of nickel to ſulphat of iron, or by diſſolving the two oxyds in ſulphuric acid. It affords green cryſtals, which are efflorescent.

A triple ſalt is alſo formed by adding an exceſs of ammonia to nitrat of nickel, conſiſting of nitric acid united with oxyd of nickel and ammonia. It affords green coloured cryſtals. This ſalt has the peculiar property of being decompoſed by the alkalies, at leaſt the oxyd is not precipitated. This property is of ſome importance for ſeparating nickel from other metals. The metal is, however, precipitated by the hydro-ſulphurets. For the principles on which the numbers repreſenting the relative weights of the atoms of bodies are calculated, ſee PROPORTION *of Chemical Compounds.*

NICKELHAJEN, in *Geography*, a town of Pruſſia, in the province of Oberland; 9 miles S.E. of Salfeldt.

NICKELSDORF, a town of Pruſſia, in the palatinate of Culm; 12 miles N. of Straſburg.

NICKELSTADT, a town of Sileſia, in the principality of Liegnitz; 5 miles S.S.E. of Liegnitz.

NICKER TREE, in *Botany*. See GUILANDINA.

NICKIOBING, in *Geography*, a town of North Jutland, ſituated on the E. coaſt of the iſland of Mors, with a good harbour in the Lymford gulf; 38 miles W.N.W. of Wiborg. N. lat. 56° 54′. E. long. 8° 52′.

NICLOWITA, a town of Moravia, in the circle of Znaym; 10 miles N. of Znaym.

NICOBARS, or NANCAVERIS, a group of three iſlands in the Eaſtern ſea, ſituated between 8° and 9° N. lat. to the northernmoſt point of the iſland of Sumatra. The poſition of three of theſe iſlands forms one of the ſafeſt harbours in India, where ſhips of all ſizes may ride with the greateſt ſecurity, ſheltered from all winds, about half a mile from ſhore; with the additional advantage of two entrances, that may ſerve for getting in and out, both with a N.E. and S.W. monſoon, having a clear deep channel on each ſide. The largeſt of theſe iſlands, called Nancaveri or Nancoury, is about five or ſix leagues in circumference, and better inhabited than either of the other two. The ſecond is called Sowry or Chowry, and the other Tricút, all cloſely ſituated, and about 10 leagues to the N.E. of them is another called Catchoul. Almoſt the whole of theſe iſlands is uncultivated; though there are many large valleys that might be rendered very fruitful, with little trouble, the ſoil being naturally fertile, where the cocoa-nut and all other tropical fruits come ſpontaneouſly to the higheſt perfection, together with yams and ſweet potatoes, for obtaining which it is only neceſſary to ſcratch the earth ſuperficially, and the ſeeds ſo planted come forth in a few days. Tricút, which is the flatteſt of theſe iſlands, is divided among the inhabitants of the other two, where they have their plantations of cocoa-nut and areca trees; theſe laſt being very abundant all over the iſlands. The ſurrounding ſea abounds with exquiſite fiſh, ſhell-fiſh, as cockles and turtles; and a moſt ſplendid diſplay of beautiful ſhells of the rareſt ſort is to be met with on the ſhore. The birds' neſts, ſo much eſteemed in China, are to be found among the rocks; ambergris is found here, and the inhabitants have acquired the art of adulterating it; but the method of diſcovering whether it be adulterated with any heterogeneous ſubſtance, ſuch as wax or reſin, is to place a ſmall bit of it upon the point of a hot knife; and if it evaporates, without leaving any calx, and diffuſes a ſtrong fragrant ſmell, it is certainly genuine.

The inhabitants of theſe iſlands are of a copper colour, with ſmall oblique eyes, with ſmall flat noſes, large mouths, thick lips, and black teeth; well proportioned in their bodies, rather ſhort than tall, with large ears, in the lobes of which are large holes: they have black ſtrong hair, which they cut round; the men have little or no beard; the hinder part of their head is much flatter than ours; they never cut their nails, but they ſhave their eyebrows. A long narrow cloth, made of the bark of a tree, round their waiſt and between their thighs, with one extremity hanging behind, which has led ſome ignorant perſons to report that they had tails, and to miſlead even Linnæus, is their only dreſs. The women reſemble the men in colour and dreſs, but are of ſmaller ſtature. Both ſexes are very fond of dreſs, whenever they can obtain it. They live in huts made of cocoa-nut leaves ſupported on bamboos, about five or ſix feet high from the ground; they enter theſe by a ladder, and the floor is made partly of planks and partly of ſplit bamboos. Six or eight people generally occupy one hut, and ſkulls of wild boars form the moſt valuable articles of furniture. The occupation of the men conſiſts in building and repairing their huts, and alſo in fiſhing and trading to the neighbouring iſlands. The women are employed in preparing the victuals and cultivating the ground; they alſo paddle in the canoes, when the men go out. They unite in matrimony through choice; but if the man is diſſatisfied with his wife, from any cauſe whatſoever, he may diſcharge her, and then each may unite with another perſon. Adultery is accounted highly ignominious; and in ſome caſes puniſhable not only with a diſgraceful diſmiſſion, but even with death: although by the intervention of a ſmall token given publicly, and conſiſting of nothing more than a leaf of tobacco. The reciprocal leading of their wives of the ſame caſt is very common. A woman that has three children is reckoned very fruitful; few bear more than four. Few perſons in theſe

theſe iſlands, particularly among the males, live to be more than 40 or 48 years. Their indolency is not equalled by any other people of the eaſt. Of thoſe who can read and write they have the higheſt opinion; the Europeans, poſſeſſing theſe qualifications, can perform acts more than human; and they conceive, that the power of divination, of controuling the winds and ſtorms, and of directing the appearance of the planets, is at our command. The dead are buried cloſe by their huts, in their beſt dreſs and with plenty of food, and with much previous lamentation on the part of ſurvivors. The different changes of the moon are productive of great feſtivity among the Nicobarians. In chronological computations, they reckon only by moons, of which they number 14, ſeven to each monſoon. At the fair ſeaſon, or beginning of the N.E. monſoon, they ſail in large canoes to the "Car Nicobars," called by them "Champaloon." The object of this voyage is trade; and for cloth, ſilver coin, iron, tobacco, and ſome other articles, which they obtain from Europeans, together with fowls, hogs, cocoa and areca nuts, the produce of their own iſland, they receive in exchange canoes, ſpears, ambergris, birds' neſts, tortoiſe ſhells, &c. Ten or twelve huts form a village. The number of inhabitants on any one of theſe iſlands does not exceed 7 or 800. Every village has its "head-man," or captain, who is generally the oldeſt. The only quadrupeds on theſe iſlands are hogs and dogs. Among the feathered tribe pigeons are abundant from June to September, on account of a berry which is then ripe, and of which they are very fond; pheaſants and turtle doves are alſo then found; but the conſtant inhabitants of the woods are a ſpecies of the green parrot, or parroquet, with a black tail and collar. The climate might, with little trouble in cultivation and clearing the woods, be rendered very ſalubrious. The whole of their muſic conſiſts of few notes: their dance is dull and inanimate; the baſis of their language is the Malay, but they have no expreſſion for any number beyond 40. They have trees in their woods of great height and ſize, and of a compact texture, which might ſerve for naval purpoſes; but the cocoa and areca nut trees are thoſe which they moſt value. The former ſerve for their own nouriſhment and that of their hogs, and is alſo an object of trade. The ſhips that are bound to Pegu from either of the coaſts of India touch at the Nicobar iſlands, and purchaſe a cargo of cocoa-nuts at the rate of four for a tobacco leaf, and 100 for a yard of blue cloth, and a bottle of cocoa-nut oil for four leaves of tobacco. The tropical fruits grown in theſe iſlands are exquiſitely flavoured, and particularly the pine-apple: the wild cinnamon and ſaſſafras grow here. The tree called by the natives "Larum," and by the Portugueſe "Mellori," is very abundant, and produces an excellent bread-fruit, different from the kind found in the interior parts of Africa, and alſo from that of Otaheite. This tree is a ſpecies of the *Pandanus* of botaniſts. Aſiatic Reſ. vol. iii.

NICOCOR, a town of Africa, in the kingdom of Cayor, near the ſea; 40 miles N.W. of Amboul.

NICOL, in *Natural Hiſtory*, a word uſed by the miners in Germany to expreſs a greeniſh cruſt, covering ſeveral of the ſpecies of marcaſites and cobalt; it emits fumes that ſmell of garlic in the calcination, and is very injurious to the workmen, cauſing contractions of their limbs, and other diſorders. It is ſometimes found in maſſes alone, but that more rarely.

NICOLAI CATHOLICON. See CATHOLICON.

NICOLAITANS, or NICOLAITES, in *Eccleſiaſtical Hiſtory*, one of the moſt ancient ſects in the Chriſtian church; thus denominated from Nicolas, a perſon ordained a deacon of the church of Jeruſalem, together with St. Stephen.

The diſtinguiſhing tenet of the Nicolaitans, as repreſented by eccleſiaſtical hiſtorians, is, that all married women ſhould be common; to take away all occaſion of jealouſy.

Other authors tax Nicolas with other impurities; but Clemens Alexandrinus imputes them all to his diſciples, who, he ſays, abuſed their maſter's words.

In the charge urged againſt the Nicolaitans (Rev. ii. 6, 14, 15.) they are not reproached with erroneous opinions concerning the Deity, but with the licentiouſneſs of their practice, and the contempt of that ſolemn law, which the apoſtles had enacted, (Acts, xv. 29.) againſt fornication, and the uſe of meats offered to idols. It is, however, certain, that the writers of the ſecond and the following centuries, Irenæus, Tertullian, Clemens, and others, affirm, that the Nicolaitans adopted the ſentiments of the Gnoſtics, concerning the two principles of all things, the æons, and the origin of this terreſtrial globe. The authority of theſe writers, ſays Moſheim, would be entirely ſatisfactory in this matter, were there not ſome reaſon to imagine, that they confounded, in their narrations, two ſects very different from each other, *viz.* that of the Nicolaitans, mentioned in the Revelations; and another, founded by a perſon named Nicolaus, in the ſecond century, upon the principles of the Gnoſtics.

Cocceius, Hoffman, Vitringa, and Maius, take the name Nicolaitan to be coined, to ſignify a man addicted to pleaſure and debauchery; adding, that it has nothing to do with Nicolas, one of the ſeven deacons. This Nicolas was condemned by Hippolytus and Epiphanius; whilſt Ignatius, Clement, Euſebius, and Theodoret, though they condemned the hereſy of the Nicolaitans, ſay that Nicolas was not ſuch an one. Hippolytus, in his book againſt hereſies, includes that of the Nicolaitans.

NICOLAS, *Argonauts of St.* See ARGONAUTS.

NICOLAS, in *Geography*, a ſmall iſland near the N. coaſt of Cuba. N. lat. 23° 15'. W. long. 79° 40'.

NICOLAU, or NIKOLOWICE, a town of Sileſia, in the principality of Ratibor; 27 miles E. of Ratibor.

NICOLAUS, DAMASCENUS, in *Biography*, a philoſopher and hiſtorian, was in great eſteem in the age of Auguſtus, by whom, as well as by king Herod, he was admitted to intimate friendſhip. He was born at Damaſcus, of the Peripatetic ſect, and was very extenſively learned. Many of his writings are referred to by Suidas and others, of which only ſome fragments are come down to our times. A Hiſtory of Aſſyria, of his compoſition, is quoted, which is ſaid to have been part of an Univerſal Hiſtory, in many books, referred to by Joſephus, Suidas, and Athenæus. Some paſſages of this are cited by Joſephus, who impeaches the author's veracity with reſpect to the account of Herod, written during the life of that prince. Strabo quotes from him certain matters relative to India. Henry de Valois publiſhed at Paris, in 1634, in Greek and Latin, the collections from different works of this author made by Conſtantine Porphyrogenitus, and brought from the iſle of Cyprus by Peireſc. Moreri.

NICOLAYKEN, or ST. NICHOLAS, in *Geography*, a town of Pruſſia, in the province of Natangen; 68 miles S.S.E. of Königſberg. N. lat. 53° 38'. E. long. 21° 43'.

NICOLE, FRANCIS, in *Biography*, a very celebrated French mathematician, who flouriſhed in the eighteenth century, was born at Paris in the year 1683. He early diſcovered a ſtrong attachment to mathematical ſtudies, and being bleſſed with an able inſtructor, he made a moſt ſucceſsful progreſs, and became intimately converſant with the higher branches of geometry. He was firſt brought into notice by detecting the fallacy of a pretended quadrature of the circle.

circle. The author of this quadrature was ſo confident in the merit of his ſuppoſed diſcovery, that he depoſited 3000 livres in the hands of a public notary at Lyons, to be paid to any perſon who, in the judgment of the Academy of Sciences, ſhould demonſtrate his ſolution to be erroneous. Nicole undertook the taſk, and ſo effectually expoſed the author's errors, that the Academy awarded him the prize, without the ſmalleſt heſitation. The premium thus obtained he preſented to the Hôtel-Dieu of Lyons. In the year 1707, the Academy nominated him mechanician; in 1716, adjunct; in 1718, aſſociate; and in 1724, penſioner. He retained his penſion till his death in 1758, when he was about ſeventy-five years of age. Though a profound geometrician, he mixed with the beſt company, and was himſelf a lively and amiable companion. His works are numerous, and inſerted in the different volumes of the "Memoirs of the Academy of Sciences." They are all mathematical, and chiefly in the higher departments of learning: a liſt of them is given in the General Biography.

NICOLETE, in *Geography*, a town of Canada, on the S.E. bank of lake St. Pierre, at the mouth of the river Nicolete, which runs into this lake, N. lat. 46° 12′. W. long. 72° 30′.

NICOLINO GRIMALDI, *il Cavaliere*, in *Biography*, commonly known by the name of Nicolini. This great ſinger, and ſtill greater actor, arrived in England in the year 1708, which forms an era in the annals of our Lyric theatre; as he was the firſt vocal performer of the higheſt claſs from Italy that trod our ſtage, and gave us a taſte at once of fine ſinging and fine acting. He was a native of Naples; his voice was at firſt a *ſoprano*, but afterwards deſcended into a full and rich *contralto*. The firſt operas in which we have met with his name in Italy were "Tullo Oſtilio" and "Xerſe," two dramas compoſed by John Bononcini for Rome, in 1694, in which he performed with the celebrated Piſtocchi, the founder of the Bologna ſchool of ſinging. So that Quadrio has ranked him very properly among the great opera ſingers who began to appear between 1690 and 1700. In 1697 and 1698 we find him the principal ſinger in the Neapolitan operas; and in 1699 and 1700 again at Rome. From this period till his arrival in England, whither he was drawn, as Cibber informs us, chap. xi. p. 315, by the report of our paſſion for foreign operas, "without any particular invitation or engagement," he ſung at Venice, Milan, and other cities of Italy where the muſical drama was eſtabliſhed. Before his abilities as a ſinger are conſidered, let us remind the reader of ſir Richard Steele's eloge upon him, in the Tatler, N° 115, as an actor; where, after calling the opera (it was "Pyrrhus and Demetrius") "a noble entertainment," he adds, "for my own part I was fully ſatisfied with the ſight of an actor, who, by the grace and propriety of his action and geſture, does honour to the human figure. Every one will imagine I mean ſignior Nicolini, who ſets off the character he bears in an opera by his action, as much as he does the words of it by his voice. Every limb and every finger contributes to the part he acts, inſomuch that a deaf man may go along with him in the ſenſe of it. There is ſcarce a beautiful poſture in an old ſtatue which he does not plant himſelf in, as the different circumſtances of the ſtory give occaſion for it. He performs the moſt ordinary action in a manner ſuitable to the greatneſs of his character, and ſhews the prince even in the giving of a letter, or diſpatching of a meſſenger. Our beſt actors," continues he, "are ſomewhat at a loſs to ſupport themſelves with proper geſture, as they move from any conſiderable diſtance to the front of the ſtage; but I have ſeen the perſon, of whom I am now ſpeaking enter alone, at the remoteſt part of it, and advance from it with ſuch greatneſs of air and mien, as ſeemed to fill the ſtage, and at the ſame time commanded the attention of the audience with the majeſty of his appearance."

The opera prices were raiſed on the arrival of this performer, the firſt truly great ſinger who had ever ſung in our theatre, to 15*s*. for the boxes on the ſtage, half a guinea the pit and other boxes, and firſt gallery five ſhillings. Nicolini was a phenomenon that occupied the attention at this time of the whole nation; not only ſir Richard Steele has celebrated the majeſty of his appearance on the ſtage in the Tatler; but Mr. Addiſon, not in very good humour with operas ſo ſoon after the failure of his "Roſamond," celebrates the abilities of Nicolini as an actor in the Spectator, N° 13, after ſeveral humorous papers on the combat with the lion in the opera of "Hydaſpes," with very high and ſerious panegyric. "It gives me a juſt indignation," ſays he, "to ſee a perſon whoſe action gives new majeſty to kings, reſolution to heroes, and ſoftneſs to lovers, thus ſinking from the greatneſs of his behaviour, and degraded into the character of the London 'prentice. I have often wiſhed, that our tragedians would copy after this great maſter in action. Could they make the ſame uſe of their arms and legs, and inform their faces with as ſignificant looks and paſſions, how glorious would an Engliſh tragedy appear with that action, which is capable of giving a dignity to the forced thoughts, cold conceits, and unnatural expreſſions of an Italian opera." In 1712, when Nicolini appeared in the opera of "Antiochus" for the laſt time before his departure for Italy, as was imagined for ever, Mr. Addiſon, in the Spectator for June 14th, N° 405, ſays, "I am ſorry to find, by the opera bills for this day, that we are likely to loſe the greateſt performer in dramatic muſic that is now living, or that perhaps ever appeared upon a ſtage. I need not acquaint my readers that I am ſpeaking of ſignior Nicolini. The town is highly obliged to that excellent artiſt, for having ſhewn us the Italian muſic in its perfection, as well as for that generous approbation he lately gave to an opera of our own country, in which the compoſer endeavoured to do juſtice to the beauty of the words, by following that noble example, which has been ſet him by the greateſt foreign maſters in that art." This is all alluſive to the opera of "Calypſo," with the fifth performance of which the ſeaſon was cloſed, June 25th. Nicolini, however, returned to England, and in the year 1715 we find him performing in Handel's opera of "Rinaldo," and receiving his accuſtomed applauſe. And, according to the ideas which tradition gives us of the abilities of this performer, his part in "Rinaldo" muſt have drawn out all his powers both as a ſinger and actor. He continued here till the year 1717, when he returned to Italy for the laſt time; but continued in favour there as an actor, after his vocal powers were faded, and a new ſtyle of ſinging was eſtabliſhed; for in 1723 we ſtill find him at Rome with the Teſi, in Leo's "Timocrate."

NICOLO DEL ABATE, born at Modena in 1512, was the diſciple of Antonio Begarelli, a Modeneſe ſculptor, whoſe models Corregio is ſaid to have often made uſe of in his works. Little is known of his progreſs at Modena, except that in partnerſhip with his fellow ſcholar Alberto Fontana, he painted the pannels of the butcher's hall in that place; and at the age of thirty-five, for the church of the Benedictines, the celebrated picture of the Martyrdom of St. Peter and St. Paul, now in the gallery at Dreſden, with ſome freſco paintings drawn from Arioſto and Virgil, in the palace of Scandiano. Of his works at Bologna, tradition has left a very diſtinguiſhed account, though little or nothing exiſts of them now but the large ſymbolic picture in the

Via di St. Mamolo, which Malvaſia calls a hieroglyphic; a nativity of Chriſt, under the portico of the Lconi palace: and four converſation pieces and concertos, of exquiſite taſte and urbanity, in the frieze of an upper apartment in the Academical Inſtitute, which have been engraved.

Notwithſtanding the innate vigour, the genial facility, and independent ſtyle of Nicolo Abate, he owes the perpetuity of his name, in a great meaſure, to his technic coalition with Franceſco Primaticcio, and to the facility with which he executed the comprehenſive and luxuriant plans of that claſſic machiniſt: even his own name was ſunk in the title of that patron rather than partner of his labours, and he is called Nicolo del Abate, becauſe Primaticcio was abbot of St. Martin, near Troyes. He went to France at his call in 1552, and his was the principal hand which executed in freſcos of unparallelled vigour and glow the extenſive ſides and cielings of the galleries and apartments at Fontainbleau, from the deſigns of Primaticcio. The ſubjects were epic and mythologic: in the great gallery, the adventures of Ulyſſes, in 58 compartments, below; and the gods of Homer, in 15 of various dimenſions, above.

This magnificent work, to the eternal diſgrace of the barbarian of an architect who gave, and the Goth of a miniſter who liſtened to the advice, was dilapidated and levelled with the ground in Dec. 1738, to make room for a new fabric; and nothing remains but a few pictures of the hiſtory of Alexander, in the apartment of madame d'Eſtampes, which was left ſtanding. The adventures of Ulyſſes have been etched by Theodore van Fulden; and ſome of the lunettes and larger compoſitions of the gallery have been engraved by G. Mantuano, Anthony Garnier, and Stephen de Laulne. Fuſeli's Pilkington.

Nicolo, Germ., in *Muſic*, a wind inſtrument, blown with a reed, and uſed as a tenor to the baſſoon, of which the hautbois is the treble. Walther.

NICOLOSIO, John-Baptist, in *Biography*, a Sicilian geographer of ſome eminence, who died at Rome in the year 1670. He was well grounded in thoſe departments of knowledge upon which the true principles of geography reſt, and by his ſuperior talents recommended himſelf to the notice of pope Alexander VII. His principal works are "Hercules Siculus, five Studium Geographicum," in two volumes; "Guida allo Studio Geographico;" "La Theorica del Globo Terreſtre;" "Orbis Deſcriptio," in ten large maps; "A Deſcription of the Dominions of the Church;" "A Deſcription of the Kingdom of Naples;" "Maps and Charts, with Notes illuſtrative of the Hiſtory of Alexander, by Quintus Curtius," and other works.

NICOLSBURG, in *Geography*, a town of Moravia, in the circle of Brunn; 22 miles S. of Brunn. N. lat 48° 52'. E. long. 16° 33'.

NICOLSON, William, in *Biography*, an Engliſh prelate, diſtinguiſhed for his knowledge of the hiſtory and antiquities of his country, was born about 1655, at Orton, in Cumberland, in which county his father was pariſh rector. He ſtudied at Queen's college, Oxford, and ſoon after quitting the univerſity, was ſent by ſir Joſeph Williamſon, ſecretary of ſtate, to travel on the continent. From his obſervations in this tour, he was enabled to draw up a copious deſcription of Poland, Denmark, and Germany, which was printed in Pitt's Atlas, in 1680-1. On his return from his travels, he took his degree of M.A., became fellow of his college, and was made chaplain to the biſhop of Carliſle, who gave him a prebend, and an archdeaconry, with a vicarage in his dioceſe. In 1696 he publiſhed the firſt part of his "Engliſh Hiſtorical Library," a work to which we have often referred, and which was intended to give a brief view and character of moſt of our national hiſtorians, whoſe writings are extant either in print or MS. It was followed by a ſecond part in 1697, and a third in 1699; and all the parts were publiſhed together, in a more enlarged and correct ſtate in 1714. Previouſly to this laſt date, he publiſhed "A Scottiſh Hiſtorical Library," of the ſame kind; and in that year he was promoted to the biſhopric of Carliſle. His "Engliſh Library" drew down upon him an attack from Atterbury, in his work on the "Rights, Powers, and Privileges of an Engliſh Convocation." Dr. Nicolſon replied to it in a letter to Dr. White Kennet. In 1717 he was engaged in a diſpute reſpecting ſomething he was reported to have ſaid in relation to the celebrated ſermon of Dr. Hoadley, then biſhop of Bangor, which occaſioned the Bangorian controverſy; and in the courſe of the diſcuſſion, biſhop Nicolſon and Dr. White Kennet publicly and poſitively contradicted one another, as to an occurrence between them. This circumſtance is thought to have occaſioned the biſhop's removal to Ireland, being in 1718 tranſlated to the ſee of Londonderry. His enquiries in that country gave riſe to his "Iriſh Hiſtorical Library," printed at Dublin in 1724. He ſhewed his attention to the intereſts of his ſee, by erecting a building in the palace-garden for the preſervation of the records and other manuſcripts relating to it. In January 1726-7, he was tranſlated to the archbiſhopric of Caſhell; but before he could take poſſeſſion of it, he died at Londonderry, in the February following. He was unqueſtionably a man of great learning, to whom the world is much indebted, not only for his antiquarian reſearches, but for his knowledge in the ſciences in general. A liſt of his publications, independently of his "Libraries" already noticed, is given in the Biog. Britannica.

NICOMEDES, an ancient geometrician, celebrated for having been the inventor of the curve named the conchoid, which has been made to ſerve equally for the reſolution of the two problems relating to the duplication of the cube, and the triſection of an angle. It was much uſed by the ancients, in the conſtruction of ſolid problems. Sir Iſaac Newton approved it for triſecting angles, or finding two mean proportionals, and for conſtructing ſome other ſolid problems, as may be ſeen in his "Arithmetica Univerſalis." It is not certain at what period Nicomedes flouriſhed, but it was probably at no great diſtance from the time of Eratoſthenes, as he holds him up to ridicule on account of the mechaniſm of his *Meſolabe*, (which ſee,) and alſo from the circumſtance that Geminus, who lived in the ſecond century B.C. wrote on conchoids, of which Nicomedes was then allowed to be the inventor. See Conchoid.

Nicomedes, or Mesomedes, a famous muſician, who flouriſhed about the year 145 of the Chriſtian era, under the reign of Antoninus. He was the firſt who drew up a body of rules for performing on the lyre. The emperor, however, retrenched his ſalary as a muſician of the court, telling him that it would be ſhameful, and even cruel, if thoſe whoſe labours were of no uſe to the ſtate ſhould partake of his benefits. Other ſovereigns, in other times, have regarded the art of muſic as very uſeful to humanity. Laborde.

NICOMEDIA, in *Ancient Geography*, a town of Aſia Minor, in Bithynia, on the Aſtacene gulf. It had once borne the appellation of Olbia, a pretended nymph who had laid its foundation. Nicomedes, king of Bithynia, afterwards enlarged and embelliſhed it, and gave it his own name. Pauſanias ſays that it was one of the moſt conſiderable towns of Bithynia. Hannibal made it a place of refuge, when he could find no other aſylum from the fury of the Romans.

NICO-

NICOMIA, in *Natural Hiſtory*. See CHERT.

NICON, in *Biography*, a diſtinguiſhed Ruſſian prelate, was born in 1613, of obſcure parents, in a village belonging to the government of Niſhnei Novgorod. He received at the baptiſmal font the name of Nikita, which afterwards, when he became a monk, he changed to Nicon, the appellation by which he is more generally known. He was educated in the convent of St. Macarius, where his ſtudies were directed almoſt entirely to the holy ſcriptures, and influenced by the exhortations of his preceptors, he imbibed at a very early period the ſtrongeſt attachment to a monaſtic life, but his father ſet his face againſt it, and he entered into the marriage ſtate, and thus precluded from admiſſion into the convent, he was ordained a ſecular prieſt. With his wife he ſpent ten years, firſt as a pariſh-prieſt in a country village, and afterwards at Moſcow in the ſame capacity; but having loſt three children, whom he tenderly loved, he became diſguſted with the world, and having perſuaded his wife to take the veil, he entered into the monaſtic order. He choſe for his retreat a ſmall iſland in the White ſea, inhabited only by a few perſons, who formed a kind of eccleſiaſtical eſtabliſhment, as remarkable for the auſterity of the rules as for the ſolitude of the ſituation. There were twelve monks, each occupying a ſeparate cell, about a mile and a half diſtant from one another, and from the church, which ſtood in the centre of the iſland. Theſe lonely anchorites aſſembled every Saturday evening in the church, where they aſſiſted in the performance of divine ſervice during the whole night, and the next day till noon, and then retired to their reſpective habitations. After a ſhort reſidence in this iſland, he accompanied the chief of the eccleſiaſtical eſtabliſhment to Moſcow, to raiſe a collection for the purpoſe of building a new church, but he had ſcarcely returned from this expedition, when, at the inſtigation of the principal, whom he had offended during his journey, he was driven by the other monks from the iſland. He embarked, during very tempeſtuous weather, in an open boat, with only one perſon, and was driven upon an iſland near the mouth of the river Onega. From this iſland he repaired to a monaſtery on the continent, and was admitted into the ſociety; but inſtead of inhabiting an apartment in the convent, he conſtructed a ſeparate cell on an adjacent iſland, where he lived on fiſh which he caught with his own hands, and never viſited the monaſtery but during the time of divine ſervice. On the death of the ſuperior he was unanimouſly elected to fill the vacant dignity. In this capacity he continued three years, at the end of which, being induced, by family affairs, to viſit Moſcow, he was preſented to the czar, who, captivated by his talents and learning, detained him at Moſcow, under his immediate protection. He ſoon obtained church preferment, was made abbot, archbiſhop, and at length patriarch of Ruſſia, promotions which he deſerved by his extraordinary virtues, rare talents, and ſound learning. While archbiſhop of Novgorod, he had an opportunity of diſplaying a memorable inſtance of firmneſs and diſcretion. During a popular tumult, the imperial governor took refuge in the archiepiſcopal palace againſt the fury of the inſurgents, who burſting open the gates, inſiſted, with threats of ſpeedy vengeance, that the governor ſhould be inſtantly delivered up to them. Nicon, inſtead of complying with their demand, advanced boldly into the midſt of them, and exhorted them to peace. They ſeized the worthy prelate, treated him with every indignity, and left him for dead. Obtaining ſpeedy medical aid, he recovered, and did not ceaſe his efforts till he had carried his point, and ſuch was the prudence which he manifeſted, that he actually ſoftened the hearts of thoſe who but a ſhort time before had exulted in his ſuppoſed deſtruction; and many of the deluded multitude flocked around him, intreating him not only to forgive them their ill conduct, but to intercede for them with their ſovereign. Being armed with full powers delegated by the emperor, he finally quelled the rebellion. To him alſo was committed the trial of the rebels, and the abſolute diſpoſal of life and death; an office which he executed with ſo much judgment and lenity, that he only puniſhed with death the leader of the ſedition, ten others ſuffered the puniſhment of the knoot, and were afterwards baniſhed, and a few were condemned to a ſhort term of impriſonment. The conduct of Nicon on this occaſion was admired even by his enemies: he gained the reſpect of the inhabitants by the unwearied aſſiduity with which he performed the functions of his archiepiſcopal office, and conciliated their affection by acts of unbounded charity. He built and endowed almshouſes for widows, old men, and orphans, was the great patron of the indigent; the zealous protector of the lower claſs of men againſt the oppreſſions of the great, and during a dreadful famine, appropriated the revenues of his ſee to the general relief of the poor. Nicon was no leſs conſpicuous in the vigilant diſcharge of his patriarchal office, to which he was appointed in 1652, being then in the thirty-ninth year of his age. He eſtabliſhed ſchools for the inſtruction of prieſts in the Greek and Latin languages, and enriched the patriarchal library with rare eccleſiaſtical and claſſical manuſcripts, brought from mount Athos. By the diligent reviſal of the holy ſcriptures, he perceived that many errors had crept into the printed copies of the Bible and Liturgy, and prevailed upon the czar to ſummon a general council of the Greek church at Moſcow, in which it was determined that the moſt ancient Sclavonian verſion of the bible was exact, and that the numerous errors which had crept into the later copies ſhould be corrected. He ſuperintended the printing of a new edition of this Sclavonian bible, which was become exceedingly rare. He removed from the churches the pictures of deceaſed perſons, to whom many of the Ruſſians offered the moſt blind adoration: he aboliſhed certain ceremonies, which had been carried to a ſuperſtitious exceſs; and, ſays Mr. Coxe, "in a word, his labours tended more to the reformation of the church, than the united efforts of all his predeceſſors in the patriarchal chair." Nicon was no leſs diſtinguiſhed for his talents in a civil capacity, and being conſulted by the czar on all occaſions, he ſoon became the ſoul of his councils, and gained a complete aſcendancy in the cabinet. The influence which, from the ſuperiority of his genius, he thus obtained in the czar's councils, induced Voltaire, in his erroneous account of this patriarch, to aſſert that "he wiſhed to raiſe his own chair above the throne, and that he not only uſurped the right of ſitting cloſe to the czar in the ſenate, but pretended that neither peace nor war could be made without his conſent." "This idle aſſertion," ſays Mr. Coxe, "has been adopted by the compiler of the article Ruſſia in the Univerſal Hiſtory," but nothing can be more void of foundation.

After having thus attained the higheſt ſummit of human grandeur to which a ſubject can arrive, he fell a victim to popular diſcontents, and to the cabals of a court. His fall was more ſudden than his riſe, and is traced from the following cauſes: the people became his enemies on account of his reformation of the ceremonies in the church: the prieſts and clergy, becauſe he looked for more purity in their moral conduct, and more learning than they choſe to be at the pains of acquiring; the courtiers were jealous of his pre-eminence, which was the conſequence of his ſuperior talents. All theſe parties united in one combination againſt him; and Nicon haſtened his fall by his ſupercilious demeanour, which occaſionally bordered upon arrogance; by truſting



ſolely

ſolely for his ſupport to the rectitude of his conduct, and the favour of his ſovereign, and by neglecting to guard againſt what he conſidered the petty intrigues of a court. At firſt he was excluded from the preſence of his ſovereign, and diſdaining to hold the higheſt office in the kingdom when he had loſt the confidence of his maſter, he voluntarily abdicated his patriarchal dignity. This was on the 21ſt of July, 1658, after he had held the high office only ſix years: he quitted that exalted ſtation with the ſame greatneſs of ſoul with which he had aſcended it. He was permitted to retain the title of patriarch, while the functions of his office were performed by the archbiſhop of Novgorod. He choſe for the place of reſidence the convent of Jeruſalem, built and endowed by himſelf, which is ſituated about the diſtance of thirty miles from the city of Moſcow. Upon his arrival at the convent, he immediately re-aſſumed his former recluſe way of life, and practiſed the moſt rigid mortifications. The hermitage which he inhabited is thus deſcribed by an author who viſited the ſpot in the beginning of the laſt century: "a winding ſtair-caſe, ſo narrow, that one man could hardly paſs, leads to a little chapel, of about a fathom ſquare, in which the patriarch uſed to perform his ſolitary worſhip. The room in which he lived was not much larger; in it hung a broad iron plate, with a croſs of braſs, fixed to a heavy chain, weighing above twenty pounds, all which the ſaid patriarch wore about his neck for twenty years together. His bed was a ſquare ſtone two ells in length, and ſcarcely one in breadth, over which was ſpread nothing but a covering of ruſhes. Below, in the houſe, was a ſmall chimney, in which the patriarch uſed to dreſs his own victuals." Nicon did not ſpend his whole time in the performance of uſeleſs auſterities, he employed himſelf in compiling a regular ſeries of Ruſſian annaliſts from Neſtor, the earlieſt hiſtorian of that country, to the reign of Alexey Michaelovitch. After comparing and collating numerous manuſcripts, he digeſted the whole collection in chronological order, into a work, which is ſometimes called, from its author, "The Chronicle of Nicon," and ſometimes, from the place where it was begun and depoſited, "The Chronicle of the Convent of Jeruſalem." This compilation is juſtly eſteemed as a work of great authority. The innocent manner in which the author paſſed his time could not protect him from the perſecution of his enemies. Complaints were urged againſt him, and new crimes were invented to render him ſtill more obnoxious, till at length he was depoſed, and baniſhed to a diſtant convent. The principal cauſe aſſigned for this depoſition was, that Nicon, having by his voluntary abdication meanly deſerted his flock, was unworthy to fill the patriarchal chair; and this allegation is a ſufficient proof that the other crimes were maliciouſly imputed to him, circulated merely to prejudice the czar, and to influence the judges againſt him. In conformity to his ſentence, Nicon was degraded to the condition of a common monk, and impriſoned in the convent of Therapont, in the government of Bielozero. His confinement, for ſome time, was extremely rigorous, becauſe, conſcious of his own integrity, he perſiſted in a denial of all guilt, and refuſed to compromiſe the matter by accepting a pardon for crimes which he had never committed. Upon the death of Alexey, in 1676, Feodor, probably at the inſtigation of his prime miniſter, prince Galitzin, the friend and patron of genius, permitted Nicon to remove to the convent of St. Cyril, in the ſame government, where he enjoyed the moſt perfect liberty. Nicon ſurvived his depoſition fifteen years. In 1681, he obtained permiſſion to return to the convent of Jeruſalem, that he might end his days in that favourite ſpot, but the venerable old man expired upon the road on his journey, in the ſixty-ſixth year of his age. His remains were tranſported to that convent, and buried with all the ceremonies which are uſual at the interment of patriarchs. See Coxe's Travels, vol. ii.

NICONIA, in *Ancient Geography*, a town ſituated on the Euxine ſea, at the mouth of the Iſter.—Alſo, a town placed by Strabo on the northern bank of the Tyras, or Dnieſter, about 140 ſtadia from its mouth. It was probably the ſame with the preceding town.

NICOP, in *Geography*, a town of European Turkey, in Bulgaria; 45 miles E.S.E. of Nicopoli.

NICOPOLI, a town of European Turkey, in Bulgaria, ſituated on the Danube, ſaid to have been built by Trajan, after a victory over the Dacæ. It is the ſee of a biſhop, ſuffragan of Sophia, and the reſidence of a ſangiac; 164 miles N.W. of Adrianople. N. lat. 43° 51′. E. long. 24° 8′.

NICOPOLI, or *Glanich*, a town of Turkiſh Armenia, built by Pompey; 15 miles S. of Erzerum.—Alſo, a town of European Turkey, in Romania, on the Meſto; 90 miles E.N.E. of Saloniki.

NICOPOLIS, or NICOPOLI, in *Ancient Geography*, a town of Greece, in Epirus; founded by Auguſtus as a monument of the victory obtained at Actium over Antony. Pliny repreſents it as a free town: Tacitus gives it the title of a Roman colony. Strabo informs us that Auguſtus, having collected into this place the inhabitants of the deſerted towns in its vicinity, gave it the name of Nicopolis; and by way of diſtinguiſhing it from ſeveral other towns of the ſame name, called it "Achaiæ Nicopolis," or "Actia Nicopolis."

NICOPOLIS, or *Nicopolis ad Hæmum*, a town of Thrace, at the foot of mount Hæmus, towards the ſource of the river Iatrus; placed by Ptolemy between Praſidium and Oſtaphos.

NICOPOLIS, a town of Lower Mœſia, at the mouth of the river Iatrus, on the Danube. In order to diſtinguiſh it from Nicopolis upon the Hæmus, built alſo upon the Iatrus, it was called "Nicopolis ad Danubium," or "Nicopolis ad Iſtrum." Ammianus Marcellinus ſays, that it was founded by Trajan, after his victory over the Dacians. See NICOPOLI.

NICOPOLIS, or *Nicopolis ad Neſſum*, a town of Thrace, founded by Trajan, ſome leagues from the mouth, and to the left of the river Neſſus. Ptolemy places it between Pantallia and Topiris.

NICOPOLIS, a town of Egypt, in the environs of Alexandria. Joſephus places it at twenty ſtadia from Alexandria, in Judæa. According to Dion Caſſius, Auguſtus was its founder, who gave it the ſame name, and conferred upon it the privilege of the ſame games with the town of Nicopolis in Epirus.—Alſo, a town of Aſia, in Cilicia, ſituated in the mountains, on the river Pinarus, N.E. of its mouth.—Alſo, a town of Armenia Minor, built by Pompey according to Strabo. Ptolemy places it in the interior of the country, at a diſtance from the Euphrates, and in the vicinity of the mountains. By way of diſtinction from other towns, it was called "Nicopolis Pompeii."—Alſo, a town of Bithynia, on or near the Boſphorus.—Alſo, a town of Aſia Minor, in Cilicia Propria, between Ceſtabula and Epiphania, according to Ptolemy. Strabo places it in the number of towns which were ſituated on the coaſt of the gulf of Iſſus.—Alſo, a town of Aſia, in Phrygia Salutaris.—Alſo, a town of Paleſtine, previouſly called Emmaus. It was burnt, after the death of Herod the Great, by Quintilius Varus, for having taken part in the revolt of the Jews. This town was abandoned by its inhabitants, and reduced to the condition of a village, 60 ſtadia from Jeruſalem. It was granted to 800 veteran ſoldiers by the emperor Veſpaſian, after the ruin of Jeruſalem, A.D. 71. The

town was called Nicopolis, in commemoration of the victory of the Romans over the Jews. Under the reigns of Trajan and Antoninus Pius, this town was celebrated, and ſtruck ſeveral medals. The name of Emmaus is given to this town by Ptolemy, in his Geography, and it was called Nicopolis by the Romans. It was ruined after the reign of Antonine, but re-eſtabliſhed under Elagabalus and Alexander Severus: and the name of this latter emperor was added to its own.

NICOSIA, in *Geography*, a town of Sicily, in the valley of Demona; 32 miles N.W. of Catania.—Alſo, a town and capital of the iſland of Cyprus, ſituated in the middle of a vaſt plain, and in the centre of the iſland. It is now the reſidence of the governor, as it formerly was of the kings of Cyprus. The palaces of the ſovereigns, remarkable for the beauty of their architecture, are abandoned by the Turks to deſtruction. The ſuperb church of "Santa Sofia," in which the Chriſtian kings were crowned, has been converted into a moſque; and the habitation of theſe ſovereigns, partly demoliſhed, and partly re-edified in the eaſtern taſte, is the reſidence of the Moſlem, or governor. The ſituation of the town is agreeable; ſtreams are here abundant; and it is ſurrounded by fine gardens. The adjacent ſoil is excellent, and cultivated by the induſtry and activity of freemen, would reſume the aſpect of proſperity. This town was in a remote period a place of conſiderable extent; and ſome ruins indicate its former importance. It contained, in its more ancient ſtate, within a circumference of nine miles, temples, palaces, and ſeveral beautiful monuments, and, at a later period, many monaſteries, 300 churches, Greek and Latin, and a number of public edifices. In the year 1570, when Selim II., who then ruled the Ottoman empire, projected the conqueſt of Cyprus, it was taken, after a protracted ſiege, by an aſſault of Muſtapha, the Turkiſh general; and of 50,000 people, who had retired within the walls for ſhelter, 20,000 were maſſacred, and the reſt put in irons. Beſides the church of St. Sophia, already mentioned, it had another church, *viz.* that of St. Nicholas, which is now a bezeſten, or a kind of hall, in which all ſorts of proviſions are ſold; it is a place where the principal Turkiſh, Greek, and Armenian merchants aſſemble to tranſact commercial buſineſs. The bazar, or market-place, is extenſive, much frequented, well ſupplied with proviſions, and kept in a neat and clean ſtate. N. lat. 35° 12′. E. long. 33° 2′.

NICOTERA, a town of Naples, in Calabria Ultra, the ſee of a biſhop, ſuffragan of Reggio, near the coaſt of the Mediterranean; 32 miles N.N.E. of Reggio. N. lat. 38° 33′. E. long. 16° 16′.

NICOTIANA, in *Botany*, received its name in honour of John Nicot, of Niſmes, ambaſſador from the French court to that of Portugal, who during his reſidence at Liſbon, in 1560, received ſome of the ſeed from a Dutchman, who had it from Florida, and part of this he ſent to France. There the plant ſoon became famous, as well as in other parts of Europe, by the name of Tabac, or Tobacco.—Linn. Gen. 99. Schreb. 133. Willd. Sp. Pl. v. 1. 1014. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 390. Brown. Prod. Nov. Holl. v. 1. 447. Juſſ. 125. Lamarck Illuſtr. t. 113. Tourn. t. 41. Gærtn. t. 55.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Luridæ*, Linn. *Solaneæ*, Juſſ. Brown.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, tubular, ovate, cut half way down into five unequal ſegments, permanent. *Cor.* of one petal, funnel-ſhaped; tube longer than the calyx; limb more or leſs ſpreading, with five plaits, and five lobes. *Stam.* Filaments five, awl-ſhaped, aſcending, nearly as long as the corolla, often unequal; anthers oblong. *Piſt.* Germen ſuperior, ovate; ſtyle thread-ſhaped, as long as the corolla; ſtigma capitate, notched. *Peric.* Capſule nearly ovate, marked with a narrow furrow at each ſide, of two cells and two valves, burſting at the top into four parts. *Receptacles* half-ovate, dotted, affixed to the partition. *Seeds* numerous, kidney-ſhaped, rugged.

Eſſ. Ch. Corolla funnel-ſhaped; limb five-cleft, plaited. Stamens inclining. Capſule of two cells, and two valves, opening into four parts at the top. Calyx tubular, five-cleft.

1. N. *Tabacum*. Virginian Tobacco. Linn. Sp. Pl. 258. Willd. n. 1. Ait. n. 1. Woodv. Med. Bot. t. 60. Stokes's Mat. Med. v. 1. 390. (Hyoſcyamus peruvianus; Ger. em. 357. Βλεωοχοις; Renealm. Spec. 38. t. 37.)—Leaves lanceolate-ovate, ſeſſile, decurrent. Segments of the corolla acute. Native of America, from whence it was brought to Europe by ſir Francis Drake, in the middle of the 16th century, and is now a hardy annual in our gardens, flowering in July and Auguſt. The *herb* riſes to the height of ſix feet, and is of a rank coarſe habit, downy, viſcid and fœtid. *Leaves* alternate, claſping the ſtem, and decurrent, one or two feet long, flaccid, acute, entire; various in breadth. *Stem* round, branched, panicled, bearing abundance of long tubular, roſe-coloured *flowers*. With us this plant is chiefly cultivated in the kitchen-garden, for private uſe, ſerving to fumigate the hot-houſes, and drive away inſects, in which it is all-powerful. Revenue laws forbid the raiſing of Tobacco for ſale in England. For its more important qualities and uſes, as well as its commercial hiſtory, ſee Tobacco.

2. N. *fruticoſa*. Shrubby Tobacco. Linn. Sp. Pl. 258. Regn. Bot. tab.—Leaves lanceolate, tapering at the baſe, claſping the ſtem. Segments of the corolla acute. Stem ſhrubby.—This is ſaid to be a native of China. It has been cultivated in the Engliſh greenhouſes for more than a century. We have ſeen it in the open air, in a garden near Naples, with a *ſtem* three or four inches in diameter, forming a ſmall tree. Its woody perennial habit, and narrow *leaves*, which taper down into a ſort of *footſtalk*, that claſps the branch at its baſe, are the chief marks of diſtinction between this and the former, with which its *flowers* very nearly agree. We think Mill. Ic. t. 185. f. 1, may repreſent this ſpecies.

3. N. *undulata*. New Holland Tobacco. Ait. n. 3. Brown. Prodr. v. 1. 447. Venten Malmaiſ. t. 10. Sims in Curt. Mag. t. 673.—Radical leaves obovate, obtuſe, ſomewhat wavy; ſtem-leaves ſharp-pointed. Corolla ſalver-ſhaped, very obtuſe.—Native of New South Wales, as well as of the ſouthern part of New Holland. *Brown.* It came to Kew in 1800, and is perennial in the greenhouſe, flowering all ſummer long. The ſettlers at Port Jackſon are ſaid to uſe this herb as Tobacco. It is downy, viſcid and fœtid. *Leaves* and whole herb much ſmaller than in the Virginian Tobacco. *Flowers* racemoſe, drooping, large, white, with a green tube; fragrant at night like the *Mirabilis longiflora*. Their *limb* is nearly at a right angle with the tube, its ſegments rounded and obtuſe, ſometimes cloven. *Calyx* acutely ribbed and furrowed.

4. N. *plumbaginifolia*. Leadwort-leaved Tobacco. Viviani Hort. Dinegr. 26. t. 1.—Radical leaves ovate, contracted at the baſe; ſtem-leaves lanceolate, claſping the ſtem; all undulated. Corolla ſalver-ſhaped, acute.—The native country of this ſpecies is unknown. It has been cultivated in ſome Italian gardens, and we obtained flowering ſpecimens, in May 1804, from the ſtove of the late lady Amelia Hume. The *ſtem* is much branched from the very bottom. *Leaves* broader than in the laſt, with which ſpecies the *flowers* moſt agree in colour, ſize, and arrangement,

but differ eſſentially in the acuteneſs of their ſegments. The *calyx* alſo is wider.

5. N. *axillaris*. Axillary Tobacco. Poiret in Lamarck Dict. v. 4. 480.—Leaves oppoſite, ovate, flat, nearly ſeſſile. Stalks axillary, ſolitary, ſingle-flowered. Corolla obtuſe. Segments of the calyx deep, ſpatulate.—Gathered by Commerſon at Monte Video, and communicated by Thouin to the younger Linnæus. Of the lower *leaves* we know nothing; the upper are as above deſcribed, rather above an inch long, and near an inch wide, downy, and apparently viſcid, like the reſt of the herbage. Lower *flower-ſtalks* longer than the leaves, upper ſhorter. Segments of the *calyx* nearly equal, very deep and obtuſe. *Corolla* white or yellowiſh, ſtreaked and bordered with purple; its tube thrice the length of the calyx; limb obliquely twiſted and folded in the bud, funnel-ſhaped when expanded, with ſlight blunt ſegments. *Fruit* unknown. It is evident that ſome uncertainty muſt attend the genus of this plant, till the whole of the fructification is known, but we have concurred with Commerſon and Poiret in making it a *Nicotiana*.

6. N. *triſtis*. Dull-purple Tobacco.—Leaves lanceolate, wavy, claſping the ſtem. Corolla ſalver-ſhaped, its tube not twice the length of the calyx, and ſcarcely longer than the obtuſe limb.—Gathered by Commerſon at Monte Video. The whole *herb* is viſcid and downy. *Stem* ſomewhat branched, from one to two feet, or more, in height. Radical *leaves* roundiſh-ovate, or obovate; thoſe on the ſtem lanceolate, dilated and claſping the ſtem at their baſe; all wavy or ſomewhat criſped at the margin. *Flowers* racemoſe, the lower ones accompanied by gradually diminiſhed leaves. *Flower-ſtalks* ſeldom ſo long as the *calyx*, which is cut half way down into five unequal, linear, obtuſe, erect ſegments. *Corolla* of a dull purple, ſalver-ſhaped; tube an inch long, being not twice the length of the calyx, cylindrical; limb rather ſhorter than the tube, its ſegments roundiſh, obtuſe, horizontal, plaited. One of the *ſtamens* ſhorter than the reſt.

7. N. *ruſtica*. Common Green Tobacco. Linn. Sp. Pl. 259. Willd. n. 3. Ait. n. 4. (Hyoſcyamus niger; Matth. Valgr. v. 2. 412. H. luteus; Ger. em. 356.)—Leaves ſtalked, ovate, entire. Tube of the corolla bell-ſhaped, not twice the length of the calyx; ſegments of the limb rounded, ſpreading, one-fourth as long as the tube.—Native of America, from whence it was brought about the ſame time as the *N. Tabacum*, which it reſembles in qualities. This is a hardy annual in our gardens, flowering from Midſummer to Michaelmas. The *ſtem* is three or four feet high, leafy with panicled *branches*. *Leaves* from three to ſix inches long, of a broad ovate, or ſomewhat heart-ſhaped, obtuſe figure, on *ſtalks* one or two inches in length. *Flowers* numerous, ſcarcely an inch long, of a dull yellowiſh-green, bell-ſhaped. Segments of the *calyx* ſemi-ovate. *Capſule* roundiſh, a little depreſſed. Every part is downy, clammy, and fœtid, as in the reſt of the genus. Gerarde ſays of this plant that "taken in ſmoke, it worketh the ſame kind of drunkenneſſe that the right Tobacco doth."

8. N. *paniculata*. Panicled Tobacco. Linn. Sp. Pl. 259. Stockh. Tranſ. for 1753. 40. t. 1. Willd. n. 4. Ait. n. 5. (N. minor, folio cordiformi, tubo floris prælongo; Feuill. Peruv. v. 1. 717. t. 10.)—Leaves ſtalked, heart-ſhaped, entire. Panicles much branched. Tube of the corolla club-ſhaped, five times as long as the calyx; limb very ſhort, ſpreading, with ſhallow rounded lobes.—Native of Peru. Linnæus received the ſeeds from Bernard de Juſſieu, and having raiſed the plant, publiſhed it in the Stockholm Tranſactions. This differs from the laſt in its much more lax and compound *panicles*, and eſpecially in the length and ſlender club-ſhaped figure, of the *corolla*, though its colour is nearly the ſame. Feuillée, who diſcovered this plant in the valley of Lima, ſays not a word of its being applied to any particular uſe.

9. N. *urens*. Prickly Tobacco. Linn. Sp. Pl. 259. Willd. n. 5. (N. arboreſcens ſpinoſiſſima, flore exalbido; Plum. Cat. 3. Ic. 204. t. 211.)—Leaves ſtalked, heart-ſhaped, crenate. Spikes recurved, many-flowered. Stem hiſpid. Tube of the corolla bell-ſhaped; limb revolute.—Gathered in South America, or the Weſt Indies, by Plumier. No other botaniſt appears to have ſeen it. Our only guides therefore are his figure and ſhort definition. This ſeems to be a very large plant. The *leaves* are above a foot long, heart-ſhaped; their margin wavy and crenate. *Stem* and *ſtalks* denſely clothed with pungent briſtles. Branches of the *panicle* alternate, very long, recurved, ſpiked rather than racemoſe, the copious *flowers* being nearly, or quite, ſeſſile. Segments of the *calyx* deep, lanceolate, acute. *Corolla* above an inch long; its tube wide and bell-ſhaped; ſegments of the limb revolute, acute.

10. N. *glutinoſa*. Clammy, or Spaniſh, Tobacco. Linn. Sp. Pl. 259. Willd. n. 6. Ait. n. 6. Andr. Repoſ. t. 484. (Andra nya Tobaken; Linn. Stockh. Tranſ. for 1753. 41. t. 2.)—Leaves ſtalked, heart-ſhaped, acute, entire. Flowers racemoſe, drooping, ſomewhat ringent. Calyx as long as the tube.—Native of Peru. A hardy annual with us, flowering in the latter part of ſummer, but not valuable for its beauty. The broad, heart-ſhaped, acute, wavy *leaves* are unlike thoſe of any other ſpecies cultivated here; and the curved, ſomewhat ringent *corolla*, ſcarcely longer than the linear-lanceolate ſegments of the *calyx*, is characteriſtic. Its colours are nearly thoſe of the firſt and ſecond ſpecies, but leſs vivid. Burmann, the editor of Plumier, points out the affinity of this and the laſt, but they cannot be confounded. The ſtalked *leaves* agree in that particular with Gerarde's *Sana ſancta Indorum*, p. 357. f. 2, the cut of which, printed likewiſe in other old books, has hitherto been confounded with *N. Tabacum*, with which indeed the *flowers* accord, and not at all with the ſpecies before us. We conceive this cut relates to ſome ſpecies not hitherto aſcertained by recent botaniſts; for though *N. Tabacum* varies in the length and breadth of its *leaves*, their taper baſe, and the want of *footſtalks*, is abundantly unlike the figure to which we allude.

11. N. *puſilla*. Primroſe-leaved Tobacco. Linn. Sp. Pl. 258. Willd. n. 7. (N. foliis ovato-lanceolatis, obtuſis, rugoſis, calycibus breviſſimis; Mill. Ic. v. 2. 124. t. 185. f. 2.)—Radical leaves elliptic-oblong, rugoſe; ſtem-leaves ovate, ſmall. Flowers racemoſe. Tube of the corolla club-ſhaped, five times as long as the calyx; limb acute.—Native of Vera Cruz, from whence Houſtoun ſent the ſeeds to Miller. It is biennial, flowering in the ſtove in Auguſt. *Stem* a ſpan high, with racemoſe *branches*, of ſlender yellowiſh-green *flowers*, whoſe *corolla* is not an inch long. The *leaves* are chiefly radical, reſembling thoſe of the primroſe, but darker.

*Tabacum minimum*, Ger. em. 358, appears to be another ſpecies, hitherto unſettled, with a branched leafy *ſtem*, a ſpan high; *leaves* ovate, on footſtalks, oppoſite; and ſtalked, acute, greeniſh-yellow *flowers*. Having ſeen no ſpecimen, we leave it for future enquiry.

*N. minima* of Molina, Poir. in Lam. Dict. v. 4. 481, is alſo probably another ſpecies unknown to us. S.

NICOTIANA, in *Gardening*, contains plants of the herbaceous annual kind, of which the ſpecies cultivated are the ſhrubby tobacco (N. fruticoſa); the Virginian tobacco (N. tabacum); and the common or Engliſh tobacco (N. ruſtica.)

In the firſt there is a variety which riſes about five feet high; the ſtalk does not branch ſo much as that of the real plant; the leaves are large and oval, about fifteen inches long, and two broad in the middle, but diminiſh gradually in ſize to the top of the ſtalk, and, with their baſe, half embrace it; the flowers grow in cloſer bunches than thoſe of the original, and are white: they are ſucceeded by ſhort, oval, obtuſe ſeed-veſſels. It flowers about the ſame time with the ſort from which it comes, and grows naturally in the woods of the iſland of Tobago.

Of the ſecond ſpecies there are ſeveral varieties; as the great broad-leaved, in which the leaves are more than a foot and a half long, and a foot broad, their ſurfaces very rough and glutinous, and their baſes half embrace the ſtalk. In a rich moiſt ſoil the ſtalks are more than ten feet high, and the upper part divides into ſmaller branches, which are terminated by looſe bunches of flowers ſtanding erect; they have pretty long tubes, and are of a pale purpliſh colour. It flowers in July and Auguſt, and is the ſort commonly brought to market in pots, being ſometimes called Oronoko tobacco.

And there is another variety, in which the ſtalks ſeldom riſe more than five or ſix feet high, and divide into more branches. The leaves are about ten inches long, and three and a half broad, ſmooth, acute, ſeſſile; the flowers are rather larger, and of a brighter purple colour. It flowers at the ſame time; and is called by ſome ſweet-ſcented tobacco.

The narrow-leaved variety riſes with an upright branching ſtalk, four or five feet high. The lower leaves are a foot long, and three or four inches broad: thoſe on the ſtalks are much narrower, leſſening to the top, and end in very acute points, ſitting cloſe to the ſtalks; they are very glutinous. The flowers grow in looſe bunches at the top of the ſtalks; they have long tubes, and are of a bright purple or red colour. They appear at the ſame time with the former. Theſe varieties are alſo all natives of America.

The third ſpecies has alſo a variety which riſes with a ſtrong ſtalk near four feet high; the leaves are ſhaped like thoſe of the preceding, but are greatly furrowed on their ſurface, and near twice the ſize, of a darker green, and on longer footſtalks. The flowers are of the ſame ſhape, but larger.

*Method of Culture.*—The two firſt ſorts may be increaſed by ſowing the ſeeds annually in the ſpring, as March, on a hot-bed, the laſt in the natural ground. The ſeeds ſhould be covered about a quarter of an inch deep; and when the plants are come up, they ſhould be allowed freſh air daily, and occaſional watering, managing them as tender annuals. When the plants are from three to ſix inches high, as in May or the following month, they ſhould be planted out in moiſt weather, in the open ground; ſuch as are deſigned for ornament ſingly, and thoſe intended for uſe, in rows, any where, three feet aſunder; giving a good watering as ſoon as planted, repeating it occaſionally till the plants have got freſh root.

The ſecond ſpecies may alſo be raiſed by ſowing the ſeeds in a warm border in April, for ſetting out in the ſame manner, or by ſowing in patches in the flower-borders, &c. to remain, thinning the plants afterwards to one in each patch.

In the third ſort the ſeeds may be ſown in any bed or border in the ſpring, raking them in lightly. When the plants are three inches high, they ſhould be planted out where they are to remain; or they may be ſown in patches to remain, thinning the plants out afterwards, as above. But in America, where regular plantations are made, the method is this:

The beds being prepared, and well turned up with the hoe, the ſeed, on account of its ſmallneſs, is mixed with aſhes, and ſown upon them, a little before the rainy ſeaſon. The beds are raked, or trampled with the feet, to make the ſeed take the ſooner. The plants appear in two or three weeks. As ſoon as they have acquired four leaves, the ſtrongeſt are drawn up carefully, and planted in the field by a line, at the diſtance of about three feet from each plant. If no rain fall, they ſhould be watered two or three times. Every morning and evening the plants muſt be looked over, in order to deſtroy a worm which ſometimes invades the bud. When they are about four or five inches high, they are to be cleaned from weeds, and moulded up. As ſoon as they have eight or nine leaves, and are ready to put forth a ſtalk, the top is nipped off, in order to make the leaves longer and thicker. After this, the buds which ſprout at the joints of the leaves are all plucked, and not a day is ſuffered to paſs without examining the leaves, to deſtroy a large caterpillar which is ſometimes very deſtructive to them. When they are fit for cutting, which is known by the brittleneſs of the leaves, they are cut with a knife cloſe to the ground; and, after lying ſome time, are carried to the drying ſhed or houſe, where the plants are hung up by pairs, upon lines, leaving a ſpace between that they may not touch one another. In this ſtate they may remain to ſweat and dry. When perfectly dry, the leaves are ſtripped from the ſtalks, and made into ſmall bundles tied with one of the leaves. Theſe bundles are laid in heaps, and covered with blankets. Care is taken not to overheat them, for which reaſon the heaps are laid open to the air, from time to time, and ſpread abroad. This operation is repeated till no more heat is perceived in the heaps, and the tobacco is then ſtowed in caſks for exportation. But in China, where the uſe of tobacco both in ſnuff and for ſmoaking is very general, buildings are not thought neceſſary, according to ſir George Staunton, as they are in the Weſt Indies, for curing it; there being little apprehenſion of rain to injure the leaves when picked. They are hung on cords to dry without any ſhelter, upon the ſpot in which they grow.

It is probable that this plant might be grown with advantage in this climate, if it were not prohibited by the duty.

Theſe ſorts, when cultivated for the purpoſe of ornament, produce a fine effect by their leaves and flowers in the autumn, and alſo afford much variety.

NICOYA, or St. Lucar, in *Geography*, a town of Mexico, in the province of Coſta Rica, on a a river which runs into the Pacific ocean. From hence the inhabitants ſend to Panama ſalt, honey, maize, wheat, fowls, and the purple juice of a ſhell-fiſh found in the bay of Salinas, about 30 miles E. of the town. The Spaniards have alſo a pearl fiſhery; 80 miles W. of Carthage. N. lat. 10° 36′. W. long. 85° 50′.

NICSAR, or Niksar, a town of Aſiatic Turkey, in Caramania, the ſee of an archbiſhop; ſituated in a valley, and at the extremity of a plain watered by the Kalki Irmak, which diſcharges itſelf into the Amaſia, and is thus conveyed into the Black ſea. The approaches to Nikſar are ſaid to exceed, if poſſible, in beauty and rich vegetation thoſe to Karakiſſar. It is a long town, crowned by a ruined fort of conſiderable extent: the walls and towers appear to be works of the Saracenic age, and at a diſtance exhibit a picturesque object; though they would now afford but an impotent defence. A ſtream from the hills ruſhes through the valley, and turns the wheels of many mills for cutting the pines into planks. The houſes are no longer terraced; their roofs are moſtly of wood, ſhelving, and covered with tiles.

The

The ancient "Neocæſarea" may be eaſily recogniſed under the name of Nikſar; and it is intereſting as the city and biſhopric of St. Gregory Thaumaturgus, who found there but 17 Chriſtians, and left but 17 Pagans. He built a church in this city, under Philip, who commenced his reign in the year 241; and this, according to Tillemont, was the firſt of which hiſtory gives us any certain account. This town is placed by Morier, in his "Journey through Perſia, &c." at 30 miles from Tocat. N. lat. 39° 25'. E. long. 85° 50'.

NICTAU, a river of Nova Scotia, which runs into the ſea at Annapolis. On its banks are quantities of bog and mountain ore, where a bloomery is erected.

NICTITATING MEMBRANE, in *Anatomy*, a thin membrane, which covers the eyes of ſeveral creatures, and ſhelters them from duſt, or too much light; yet is ſo thin, that they can ſee indifferently well through it.

This nictitating membrane is chiefly found in the bird and fiſh kind.

This membrane, in the eagle's eye, is remarkably cloſe and firm, inſomuch as to be accounted as a ſecond eye-lid; and hence that remarkable firmneſs of the eagle's ſight in viewing the ſun. See *Anatomy of* BIRDS.

NICUESA, *Gulf of*, in *Geography*, lies on the eaſt coaſt of the country of Honduras, on the Spaniſh main, having Cape Gracias-a-Dios for its north limit, and Cape Blanco on the ſouth; and due weſt from Catherine or Providence. N. lat. 13° 42'.

NIDA, a town of Pruſſia, in the province of Natangen; 12 miles W.S.W. of Lick.

NIDDA, a town of the principality of Upper Heſſe; 38 miles E.N.E. of Mentz. N. lat. 50° 26'. E. long. 9° 2'.

NIDDUI, in the *Jewiſh Cuſtoms*, is uſed to ſignify ſeparated or excommunicated. This, according to ſome, was to be underſtood of the leſſer ſort of excommunication in uſe among the Hebrews. He that had incurred it was to withdraw himſelf from his relations, at leaſt to the diſtance of four cubits: it commonly continued a month. If it was not taken off in that time, it might be prolonged for ſixty, or even ninety days: but if, within this term, the excommunicated perſon did not give ſatisfaction, he fell into the *cherem*, which was a ſecond ſort of excommunication; and thence into the third ſort, called *ſhammatha*, or *ſhematta*, the moſt terrible of all. But Selden has proved that there were only two kinds of excommunication, *viz.* the greater and leſs; and that theſe three terms were uſed indifferently.

NIDDYCORDA, in *Geography*, a town of Hindooſtan, in Madura; 30 miles N.E. of Coilpetta.

NIDEN, a town of Pruſſia, in the province of Samland, on the Friſch Nerung; 25 miles S. of Memel.

NIDENSTEIN, a town of the principality of Heſſe; 7 miles S. of Caſſel.

NIDERNDORFF, a town of Auſtria; 12 miles N.N.W. of Gram.

NIDERWOLTZ, a town of the duchy of Stiria; 8 miles N.E. of Muckrau.

NIDGET, in *Agriculture*, a term applied to a ſort of harrow formed in a triangular manner, which is employed in the culture of hops, and which may be employed with advantage in cleaning other ſorts of ſowed crops. See HOP.

NIDJIBABAD, or NIDJIBGUR, in *Geography*, a town of Hindooſtan, in Oude; built by Najab-ud-Dowlah, as a convenient mart between Hindooſtan and Cachemire; 80 miles N.N.E. of Delhi. N. lat. 29° 35'. E. long. 78° 41'.

NIDUM, in *Ancient Geography*, a town of Britain, marked in Antonine's Itinerary, between Bomium and Iſcalegua Auguſta or Caerleon. Nidum is fixed by Camden, Gale, and Baxter, at Neath, in Glamorganſhire; but the real courſe of the road from Maridunum to Iſcalegua Auguſta is confeſſedly very uncertain.

NIDUS, NEST, a repoſitory, wherein certain animals, particularly fowls, inſects, and reptiles, lodge their eggs, for incubation; and wherein, when hatched, they nurſe their young, till they become able to ſhift for themſelves.

The word is Latin, and is ſuppoſed to be derived from *nidor, a rank* or *ill ſmell:* in regard the neſts of animals uſually ſtink.

Dr. Derham ſays, he has often wondered how waſps, hornets, and other inſects, that gather dry materials, (as the duſt of wood ſcraped for that purpoſe,) ſhould find a proper glutinous matter to cement and glue their combs, and line their cells: but he adds, that, in all probability, it is in their own bodies; as in the tinea veſtivora, the cadworm, &c.

Goedart obſerves of his erucas, that fed on leaves, that they made their cells of leaves glued together with their own ſpittle.

NIDUS *Avis*, in *Botany*, Bird's Neſt. See NEOTTIA, and EPIPACTIS, n. 9.

NIEBLA, in *Geography*, a town of Spain, in the province of Seville, ſituated on the river Tinta, containing three pariſhes and a convent, with about 3000 inhabitants. It is ſuppoſed to have been founded on the ſcite of an ancient town called "Cuniſtorges." It was formerly the capital of a ſmall Mooriſh kingdom, and taken by the Chriſtians in the 13th century; 11 miles N.E. of Moguer. N. lat. 37° 19'. W. long. 6° 46'.

NIEBOLOW, a town of Poland, in Galicia; 32 miles S.W. of Halitſch.

NIECE, a term relative to uncle and aunt, ſignifying a brother's or ſiſter's daughter; which, in the civil law, is the third degree of conſanguinity; and, in the common law, the ſecond.

NIECHOROSSCZA, in *Geography*, a town of Poland, in the palatinate of Kiev; 56 miles W.S.W. of Kiev.

NIECHOROZ, a town of Poland, in the palatinate of Kiev; 56 miles W.S.W. of Kiev.

NIEDERBRONN, a town of France, in the department of the Lower Rhine, and chief place of a canton, in the diſtrict of Wiſſembourg; 12 miles S.W. of Wiſſembourg. The place contains 1438, and the canton 13,811 inhabitants, on a territory of 185 kiliometres, in 20 communes.

NIEDEROLM, a town of France, in the department of Mont Tonnerre, and chief place of a canton, in the diſtrict of Mayence. The place contains 591, and the canton 9413 inhabitants, in 18 communes.

NIEDZWIEDTOZE, a town of Lithuania, in the palatinate of Novogrodek; 26 miles W.S.W. of Sluck.

NIEHUS, or NEUHAUSZ, a town of Germany, in the duchy of Saxe-Lauenburg; 8 miles W. of Thomndamm.

NIEKE CORONDE, in the language of the Ceyloneſe, the name of a ſpecies of cinnamon. The tree which produces it reſembles the nieke, another tree very common there. This is a very bad kind of cinnamon, and has very little taſte or ſmell. It is very ſeldom ſold as cinnamon, but is much in eſteem among the natives for its medicinal virtues. They obtain a water, and an oil from it, by roaſting, which

they anoint themſelves with, to preſerve them from noxious fumes, and infections of any kind; and uſe the expreſſed juice of the leaves to cool the head, and ſtrengthen the brain, rubbing it on externally. Phil. Tranſ. N° 409.

NIEL, in *Geography*, a ſmall iſland near the weſt coaſt of Scotland. N. lat. 55° 58′. W. long. 5° 32′.

NIELECOHOLO, a town of Chineſe Tartary. N. lat. 42° 1′. E. long. 124° 17′.

NIEMANOWICZE, a town of Lithuania, in the palatinate of Troki; 48 miles N. of Grodno.

NIEMECK, a town of Saxony; 18 miles N. of Wittemberg. N. lat. 52° 4′. E. long. 12° 40′.

NIEMECZ, or NIMIEC, a ſtrong town of European Turkey, in Moldavia, ſituated on a mountain, at the foot of which runs a river of the ſame name, which diſcharges itſelf in the Moldava; 76 miles W.N.W. of Jaſſi. N. lat. 47° 23′. E. long. 25° 58′.

NIEMECZYN, a town of Lithuania, in the palatinate of Wilna; 12 miles N.E. of Wilna.

NIEMEN, a river that takes its riſe a few miles ſouth of Minſk, in Lithuania, and paſſing by Grodno, joins the Wilna at Kowno; and ſoon afterwards entering Pruſſia, changes its name to Memel.

NIEMERSAT, a town of Pruſſia, in Samland, near the Baltic; 8 miles N. of Memel.

NIEMI, a town of Sweden, in Weſt Bothnia; 44 miles N. of Tornea.

NIEMUROW, a town of Poland, in the palatinate of Belcz; 36 miles S.W. of Belcz.

NIENBERG, a town of the duchy of Berg; 6 miles S.S.E. of Wipperfurt.

NIENBORG, a town of Weſtphalia, in the biſhopric of Munſter, on the Dinckel; 21 miles N.W. of Munſter. N. lat. 52° 9′. E. long. 6° 51′.

NIENBURG, a town of Germany, in the county of Hoya, on the Weſer; 12 miles S.S.E. of Hoya. N. lat. 52° 38′. E. long. 9° 21′.—Alſo, a town of Germany, called *Munch Nienburg*, in the duchy of Anhalt Cothen, ſituated on the Saale, and containing the prince's palace and a church; 8 miles N.W. of Cothen. N. lat. 51° 53′. E. long. 11° 50′.

NIENDORP, a town of the duchy of Holſtein; 5 miles E.S.E. of Gluckſtad.

NIENHOFF, a town of Holſtein; 11 miles N.N.W. of Arenſbock.

NIENHUS, or NIEUHAUS, a town of Germany, in the county of Bentheim, ſeated on the Dinckel, near its confluence with the Vechte; 17 miles S.E. of Covorden. N. lat. 52° 33′. E. long. 6° 50′.

NIENKIRCHEN, the name of three towns in the duchy of Holſtein.

NIENRADE, or DRECHROIDE, a town of Weſtphalia, in the county of Mark; 20 miles S. of Dortmund. N. lat. 51° 12′. E. long. 7° 50′.

NIENT COMPRISE, in *Law*, an exception taken to a petition, as unjuſt; becauſe the thing deſired is not in that act or deed whereon the petition is grounded.

Thus a perſon deſiring of the court to be put in poſſeſſion of a houſe, formerly adjudged to him among other lands; the adverſe party pleads, that the petition is not to be granted, by reaſon though the petitioner had a judgment for certain lands and houſes, yet this houſe is nient compriſe, not compriſed therein.

NIENT *Culpable*. See NON *eſt culpabilis*.

NIEOU-TCHUANG, in *Geography*, a town of Chineſe Tartary; 300 miles E.N.E. of Peking. N. lat. 41°. E. long. 122° 18′.

NIEPA, a town on the north coaſt of the iſland of Cuba; 55 miles N. of St. Yago.

NIEPER. See DNIEPER.

NIEPOLOMICE, a town of Poland, in the palatinate of Cracow; 10 miles E. of Cracow.

NIER, a ſmall river of Ireland, which flows from the Waterford mountains to the river Suire.

NIEREDOWA, a town of Lithuania, in the palatinate of Troki; 10 miles N. of Birza.

NIESAWAY, or NIESOVIA, a town of Perſia, in the province of Schirvan, with a harbour, on the eaſt coaſt of the Caſpian ſea; 45 miles S.S.E. of Derbend.

NIESOLONE, a town of Poland, in Volhynia; 34 miles N.W. of Zytomiers.

NIESTER. See DNIESTER.

NIESUCHWIESCHOWZA, a town of Poland, in Volhynia; 33 miles N.W. of Lucko.

NIESWICZ, a town of Lithuania, in the palatinate of Novogrodek; 24 miles N.W. of Sluck.

NIESYCE, a town of Lithuania, in the palatinate of Minſk; 44 miles N.E. of Minſk.

NIETRO, a river of Naples, which runs into the gulf of Tarento, N. lat. 39° 12′. E. long. 17° 24′.

NIEVA, an iſland ſouth-weſt of Miſtake bay, in Hudſon's ſtraits.

NIEUIL, a town of France, in the department of the Upper Vienne, and chief place of a canton, in the diſtrict of Limoges; 7 miles N.W. of Limoges. The place contains 671, and the canton 5126 inhabitants, on a territory of 137½ kiliometres, in 6 communes.

NIEUKERK, a town of Guelderland, near the Zuyder See; 8 miles S.S.W. of Harderwyck.

NIEUPORT, a ſea-port town of France, in the department of the Lys, and chief place of a canton, in the diſtrict of Furnes; which name it aſſumed when Philip, comte of Flanders, built a harbour in 1168. It lies near the ſea-ſhore, on a branch of the river Yperlee, which, by its junction with the river Colme, forms a canal that runs into the ſea. The harbour at low-water is dry. The place is chiefly defended by its ſluices, by which the adjacent country may be inundated. After the peace of Utrecht in 1713, the French ceded this town to the Engliſh, who, in 1715, ſurrendered it to his Imperial and Catholic majeſty Charles VI. But being taken again by the French in 1745, it was reſtored at the peace of Aix-la-Chapelle. Before the French revolution, here was a convent of Engliſh Chartreux, founded at Shene in 1415 by Henry V.; and in the reign of queen Elizabeth, removed firſt to Malines, and at laſt eſtabliſhed at Nieuport in the year 1626. It is inhabited chiefly by fiſhermen, and its chief trade conſiſts in nets and cordage for veſſels. In 1794 it was taken by the French; 9 miles S.W. of Oſtend. The place contains 2983, and the canton 7533 inhabitants, on a territory of 207½ kiliometres, in 19 communes. N. lat. 51° 7′. E. long. 2° 33′.—Alſo, a town of Holland, on the Leck; 15 miles E. of Rotterdam.

NIEUWE DIEP, a harbour on the north coaſt of Holland, taken poſſeſſion of by the Engliſh fleet in 1799; and near it is a magazine, called "Nieuwe Werk," taken by the Engliſh at the ſame time; 6 miles E. of Helder.

NIEUWELD and *The Ghoup*, are continuations of the Roggeveld mountain, in the diſtrict of Stellenboſch and Drakenſtein, which adjoin the Cape diſtrict, in the ſouthern part of Africa. Theſe diviſions join others of the ſame name

name in the diſtrict of Graaf Reynet. They have lately been deſerted, on account of the number of Bosjeſman Hottentots who dwell cloſe behind them.

NIEUWENTYT, Bernard, in *Biography*, a celebrated Dutch philoſopher and mathematician, was born at Weſtgraafdyk, in North Holland, in the year 1654. His father was a miniſter, and he wiſhed to educate the ſon for the ſame profeſſion; but finding him diſinclined to ſuch a deſtination, he ſuffered him to follow his own inclination. He ſtudied philoſophy according to the ſyſtem of Des Cartes, then engaged in mathematical purſuits, and became intimately acquainted with the abſtruſe ſciences. He next ſtudied medicine, and then went through a courſe of reading on juriſprudence. In the ſtudy of all theſe ſciences he ſucceeded ſo well, as deſervedly to acquire the character of a good philoſopher, a deep mathematician, and an able and juſt magiſtrate. From his writings it alſo appears, that he did not permit his various ſtudies and ſubjects of inquiry to divert his thoughts from a due attention to the great and fundamental principles of natural and revealed religion. He was naturally of a grave and ſerious diſpoſition, but at the ſame time a very affable and agreeable companion. His manners were ſo engaging, that they conciliated the eſteem of all his acquaintance: hence he acquired great credit and influence in the council of the town of Puremerende, where he reſided; and alſo in the ſtates of that province, who reſpected him the more becauſe he never engaged in any cabals or factions, but recommended himſelf only by an open, manly, and upright behaviour. He died in the year 1718, at the age of 63. He was author of many works on different ſubjects, among which are the following: "Conſiderationes circa Analyſeos ad Quantitates infinitè parvas applicatæ Principia, &c." in which he propoſed ſome difficulties on the ſubject of the analyſis of infiniteſimals; "Analyſis Infinitorum, ſcu Curvilinearum proprietates, ex Polygonorum deductæ, &c.;" "The proper Uſe of the Contemplation of the Univerſe, for the Conviction of Atheiſts and Unbelievers." This was publiſhed in 4to., in the year 1715; of which a French tranſlation was publiſhed at Paris in 1725, entitled "L'Exiſtence de Dieu dèmontrèe par les Merveilles de la Nature;" and one in Engliſh, in 3 vols. 8vo., under the title of "The religious Philoſopher, or the right Uſe of contemplating the Works of the Creator." This went through ſeveral editions, and was highly eſteemed. A work of a ſimilar kind, adapted to the preſent improved ſtate of ſcience, has been ſome years in hand by the author of the "Scientific Dialogues." Nieuwentyt, only a few weeks before his death, finiſhed an excellent refutation of Spinoza, which was publiſhed in Dutch at Amſterdam, in 1720. Moreri.

NIEZABAD, Niasabad, or *Nieſovaia Priſtan*, in *Geography*, a town of Perſia, in the province of Schirvan, with a harbour on the Caſpian ſea; 40 miles S. of Derbend. This was formerly the moſt frequented by the Ruſſians, and chiefly viſited by the merchants of Shamakee, who ſupplied the province of Schirvan with European commodities. Near the harbour are ſeveral wretched villages. N. lat. 41° 18′.

NIF, a town of Aſiatic Turkey, in Natolia; 16 miles E. of Smyrna.

NIFAN, or Niban, a town of Arabia, in the province of Oman; 80 miles S.W. of Haſſek.

NIFFO, a town of Africa, on the Grain coaſt.

NIFO, Agostino, in *Biography*, a celebrated philoſopher and man of letters, was born either at Jopoli, in Calabria, or Seſſa, in Terra di Lavoro. Having received a good education, he quitted his father's houſe, which had been made uncomfortable to him by a mother-in-law, and went to Naples, where he undertook the inſtruction of youth. He accompanied ſome of his ſcholars to Padua, where, in 1492, he was choſen profeſſor extraordinary of philoſophy. He was afterwards advanced to the profeſſorſhip in ordinary, and to the firſt chair. During his abode at Padua he embraced the doctrine of the unity of the ſpiritual ſubſtance, and that there is only one ſoul and intellect that animates all nature. This he maintained in a treatiſe "De Intellectu et Dæmonibus," which brought on him a formidable attack from the abettors of eſtabliſhed opinions, under which he would, probably, have ſunk, had not Barazzi, biſhop of Padua, kindly interpoſed, and perſuaded him to retract certain offenſive paſſages in his work. Leaving Padua he reſided ſome time at Seſſa, where he married, and had ſeveral children, and from this, his favourite reſidence, he is frequently denominated *Sueſſanus*. His reputation was now ſpread throughout Italy, and he was ſucceſſively invited to various ſchools of learning. By the prince of Salerno he was engaged to teach philoſophy for ſome time in that city. About the year 1510 he held a chair in the univerſity of Naples. In 1513 he was invited to Rome by Leo X., who honoured him with the title of count palatine, and, at the ſame time, conferred upon him the privilege of uſing the name and arms of the Medici; he was, at one time, a profeſſor at Rome, in the college of Sapienza, and, at another, he occupied a chair at Bologna. In 1519 he removed to Piſa, where he was offered a ſalary of ſeven hundred gold florins. The prince of Salerno drew him again to that city in 1525, in which, or at Seſſa, he probably paſſed the remainder of his days. The time of his death is uncertain, ſome writers fix it in 1537, but others adduce a dedication of his to Paul III. in 1545, as a proof that he was living at that period. It is, however, generally admitted that he died in 1538. Nifo was a man of mean and forbidding aſpect, but he was a very pleaſant companion; he lived chiefly among the great, and ſeems (which happens to but few literary characters,) to have been in eaſy circumſtances, and he had a very valuable library. He wrote a great number of works relative to the peripatetic philoſophy, aſtronomy, and medicine; rhetoric, ethics, politics, &c. Commentaries and tranſlations of the works of Ariſtotle and Averrhöes compoſe the greater part of them. It is ſaid that he refuted the impoſtures of aſtrologers, and was the firſt to deliver Europe from the terrors of a deluge which had been predicted for the year 1524. Roſcoe's Life of Leo X. See alſo Bayle's Dict.

NIGANISH, in *Geography*, a town or valley on the E. coaſt of the iſland of cape Breton. N. lat. 46° 40′. W. long. 60° 15′.

NIGATA, a ſea-port of Japan, on the N. coaſt of the iſland of Niphon. N. lat. 37° 30′. E. long. 139° 10′.

NIGDEH, or Nikde, a town of Aſiatic Turkey, in Caramania, ſurrounded with walls, and defended by a caſtle; 44 miles S.E. of Akſerai. N. lat. 38° 7′. E. long. 35° 10′.

NIGELLA, in *Botany*, from *niger*, black, in alluſion to the colour of the ſeeds; it being unqueſtionably the μελανθιον of Dioſcorides, ſo called with the ſame meaning. Linn. Gen. 276. Schreb. 370. Willd. Sp. Pl. v. 2. 1248. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 326. Sm. Prod. Fl. Græc. Sibth. v. 1. 373. Juſſ. 233. Tourn. t. 134. Lamarck Illuſtr. t. 488. Gærtn. t. 118. Claſs and order, *Polyandria Pentagynia*. Nat. Ord. *Multiſiliquæ*, Linn. *Ranunculaceæ*, Juſſ.

Gen.

Gen. Ch. *Cal.* none. (The floral leaves in ſome ſpecies are in danger of being miſtaken for one.) *Cor.* Petals five, ovate, flat, obtuſe, ſpreading, contracted at the baſe. Nectaries from five to ten, ſhort, ſtalked, ranged in a circle, each two-lipped; the outer or inferior lip larger, cloven, ſomewhat convex, marked with two dots; the inner ſhorter, narrower, ovate with a linear termination. *Stam.* Filaments numerous, awl-ſhaped, ſhorter than the petals; anthers compreſſed, obtuſe, erect. *Piſt.* Germens ſeveral, five or ten, ſuperior, oblong, combined, compreſſed, erect; ſtyles terminal, awl-ſhaped, angular, very long but revolute, permanent; ſtigmas longitudinal, lateral. *Peric.* Capſules as many as there were germens, oblong, compreſſed, pointed, connected by their inner margins, opening at the upper part of the inner margin. *Seeds* numerous, angular, rough.

Eſſ. Ch. Calyx none. Petals five. Nectaries from five to ten, three-cleft, two-lipped, within the petals. Capſules five, connected.

Obſ. Willdenow, by an error of the preſs, has *capſulæ convexæ*, for *connexæ*. This union of the capſules is, in ſeveral ſpecies, ſo complete, as to form apparently one ſimple globoſe ſeed-veſſel, of five cells. See Dr. Sims's excellent remarks in Curt. Mag. v. 31, under t. 1264.

Section 1. *Styles five.*

1. N. *damaſcena.* Common Fennel-flower. Love in a miſt. Devil in a buſh. Linn. Sp. Pl. 753. Curt. Mag. t. 22. (Melanthium damaſcenum; Ger. em. 1084. M. ſylveſtre; Matth. Valgr. v. 2. 152. With a double flower, Nigella flore albo multiplici; Ger. em. 1085.)—Flowers ſurrounded with a leafy involucrum. Fruit globoſe, ſmooth. —Native of corn-fields in the ſouth of Europe, and for 250 years paſt a common hardy annual in our gardens, eſpecially the double kind, varying with white or pale-blue petals. The *root* is ſmall, whitiſh. *Stem* erect, one or two feet high, branched and buſhy, ſmooth like every other part. *Leaves* alternate, doubly or triply pinnatifid, as finely cut as thoſe of Fennel, but flat; the ſegments ſpreading, linear and acute, thoſe at the bottom much crowded. *Flowers* terminal, ſolitary, encompaſſed and overtopped by a circle of leaves, much like the reſt. *Nectaries* five, alternate with the petals; their claw purple; limb green, bent upward at a right angle, with a ſpreading, purple, flat, bluntly two-lobed, hairy under lip, deſtitute of any horns or appendages. The *petals* in the double variety are multiplied, but numerous *ſtamens* remain to perform their office. The united inflated *capſules* form a ſmooth, almoſt membranous, globe, crowned with the wavy ſpreading *ſtyles*. The *ſeeds* when bruiſed have a luſcious fragrance. Gardeners keep a dwarf variety, more condenſed in its habit, with ſmall white petals.

2. N. *ariſtata.* Athenian Fennel-flower. Sm. Prod. Fl. Græc. Sibth. v. 1. 373. Fl. Græc. t. 510, unpubliſhed. —Flowers ſurrounded with a leafy involucrum. Nectaries and anthers awned. Capſules turbinate, rough.—Gathered by Dr. I. Sibthorp near Athens. This is more branched than the preceding, but the *leaves*, *flowers* and *involucrum* are ſmaller. The *petals* are heart-ſhaped, with long claws, and pointed. Under lip of the *nectaries* a beautiful object when ſomewhat magnified, being almoſt triangular, pale yellow, with a broad tranſverſe blue ſtripe bordered with purple, and having two aſcending horns in front, annulated with red; the whole clothed with long hairs. The *capſules* are oblong, triply keeled, rough with granulations, and combined merely at their inner edges, ſpreading at the top, not globoſe nor inflated, but agreeing with moſt of the following ſpecies, not at all with the preceding.

3. N. *ſativa.* Small Fennel-flower, or Gith. Linn. Sp. Pl. 753. Fl. Græc. t. 511, unpubliſhed. Zorn Ic. t. 119. (N. cretica; Bauh. Prod. 75. Melanthium ſativum; Matth. Valgr. v. 2. 151. Camer. Epit. 551. Melanthium n. 1.; Ger. em. 1084.)—Involucrum none. Fruit ſomewhat globoſe, rough. Nectaries hairy, with blunt points. Petals ovate. Leaves rather hairy.—Native of the Levant; common in Greece and the Archipelago. Dr. Sibthorp determines this ſpecies to be the real μελανθιον of Dioſcorides, and records, in his manuſcripts, that the modern Greeks ſtill retain the cuſtom, mentioned by this ancient writer, of ſprinkling its ſeeds upon their bread. In England it is ſeldom cultivated but for curioſity, being leſs handſome than ſome other kinds. The *ſtem* is leſs branched, and *leaves* broader, than in either of the preceding. *Petals*, and ten *nectaries*, pale blue or nearly white, the lower lip of the latter hairy, ending in two blunt or knobbed points, and marked with a tranſverſe violet ſtripe. *Capſules* combined, nearly as in *N. damaſcena*, but rough. The *anthers* are beaked, as in the laſt.

4. N. *arvenſis.* Field Fennel-flower.—Linn. Sp. Pl. 753. Fl. Græc. t. 512, unpubliſhed. (Melanthium ſylveſtre; Ger. em. 1084. M. ſylveſtre alterum; Matth. Valgr. v. 2. 153, but not Camer. Epit. 553, which ſeems deſigned for the laſt.)—Involucrum none. Capſules turbinate, rough. Nectaries ſmooth, with blunt points. Petals heart-ſhaped.—Native of fields in Germany, France, Italy, and the iſle of Cyprus. The *ſtem* is branched copiouſly, from the very bottom. *Leaves* once or twice three-cleft, uſually rather rounder in their whole outline than any of the foregoing. *Flowers* moſt like the laſt, but ſmaller, with heart-ſhaped *petals*, and ſmooth yelloviſh *nectaries*, though the latter are marked with a ſimilar purple ſtripe, and end in knobbed points. The *fruit* moſt reſembles that of the ſecond ſpecies. The *ſeed* is ſaid to be fragrant in this, as well as in *N. ſativa*. It is ſeldom preſerved in gardens, though known here before the end of the 17th century.

Section 2. *Styles uſually ten.*

5. N. *hiſpanica.* Spaniſh Fennel-flower. Linn. Sp. Pl. 753. Curt. Mag. t. 1265. Desfont. Atlant. v. 1. t. 112. (N. hiſpanica, flore amplo; Ger. em. 1085. Moriſ. ſect. 12. t. 18. f. 9.)—Styles ten, ſpreading, the length of the petals. Segments of the nectary obtuſe.—This ſplendid ſpecies is a native of Spain and Barbary, as well as of the ſouth of France. It has for near 200 years been cultivated, as a hardy annual, in our gardens. The whole plant is larger in all its parts than any we have already deſcribed; the *ſtem* buſhy, and ſegments of the *leaves* linear-lanceolate. *Flowers* large, of a rich purpliſh blue, varying to a pale red, with dark or reddiſh *ſtamens* and *ſtyles*. The number of the latter is, we believe, conſtantly ten. The *petals* are ovate, an inch long, veiny, pale and greeniſh underneath. Lower lip of the *nectaries* hairy, variegated with crimſon, in two divaricated, blunt, or ſomewhat knobbed, lobes.

6. N. *orientalis.* Yellow Fennel-flower. Linn. Sp. Pl. 753. Curt. Mag. t. 1264. (N. piſtillis denis, corollâ longioribus; Mill. Ic. 125. t. 187. f. 1. N. chalepenſis lutea, corniculis longioribus; Moriſ. ſect. 12. t. 18. f. 10.)—Styles uſually ten, nearly erect, twice the length of the petals. Segments of the nectary acute. Seeds compreſſed, bordered.—Native of Syria. The ſeeds were ſent from Aleppo, at the end of the 17th century. This is a hardy annual, but being leſs ſtriking in appearance than the laſt, is not ſo commonly cultivated. In the gardens of Italy we have often obſerved it, ſometimes with only five ſtyles. The *ſtem* is much branched. *Leaves* narrow. *Petals* ſpatulate, acute, about half an inch long, yellow marked with green and

and red. *Nectaries* five or more, yellow, with tranſverſe crimſon ſtripes, hairy; the ſegments of their lip acute. *Capſules* oblong, compreſſed, combined at their inner edges, about half way up. *Seeds* flattiſh, furrounded with a membranous border.

NIGELLA, in *Gardening*, compriſes plants of the hardy herbaceous flowering annual kind, of which the ſpecies cultivated are; the common fennel-flower (N. damaſcena); the ſmall fennel-flower (N. ſativa); the field fennel-flower (N. arvenſis); the Spaniſh fennel-flower (N. hiſpanica); and the yellow fennel-flower (N. orientalis).

The firſt ſpecies from the fine cut leaves about the flower, has the names of *Fennel-flower*, *Devil-in-a-buſh*, and *Love-in-a-miſt*; but the firſt is become obſolete.

And there is a variety of it with ſingle white flowers, and another with double flowers, which is frequently cultivated in gardens with other annuals for ornament.

Of the third there is a variety with white flowers, and another with double flowers.

And the fourth has likewiſe a variety with double flowers.

*Method of Culture*—Theſe plants are all increaſed by ſowing the ſeeds on light earth where the plants are to remain, as they ſeldom ſucceed well when tranſplanted, in patches at proper diſtances; and when the plants are come up, they ſhould be thinned, leaving only three or four in each patch, keeping them afterwards clear from weeds. The beſt ſeaſon for ſowing is March; but if ſome be ſown in Auguſt, ſoon after they become ripe, on a dry ſoil, and in a warm ſituation, they will abide the winter, and flower ſtrong the ſucceeding year. By ſowing the ſeeds at different times, they may be continued in beauty moſt part of the ſummer ſeaſon. As they are all annual plants they require to be raiſed every year.

But the varieties with double flowers are chiefly introduced into flower gardens.

They afford ornament and variety among other annuals in the clumps and borders of gardens and pleaſure grounds.

NIGELN, in *Geography*, a town of Pruſſia, in the province of Samland, on the Curiſch Nerung; 15 miles S. of Memel.

NIGEMOW, a town of Poland, in Galicia; 14 miles E.S.E. of Halicz.

NIGER, C. PESCENNIUS, in *Biography*, a diſtinguiſhed competitor for the Roman empire, deſcended from an equeſtrian family, ſettled at Aquinum, was brought up to the military ſervice, and paſſed through different degrees of rank, in ſuch a manner as to procure the notice and eſteem of the emperor Marcus Aurelius. Under Commodus he ſignalized himſelf in a war with the barbarians in the vicinity of the Danube, and from his conduct when ſerving againſt ſome revolters in Gaul, he was recommended to the emperor, by Septimius Severus, as a man neceſſary to the ſtate. He was afterwards raiſed to the conſulate at the particular requeſt of the troops ſerving under him, and he was in poſſeſſion of the important government of Syria, at the time of the death of Commodus, A.D. 192. The moſt ample teſtimony is given by hiſtorians to his excellence as a military commander. He puniſhed theft with the utmoſt rigour. To every thing like luxury and effeminacy in his troops he was a declared foe. He rendered every privation and ſuffering tolerable to his ſoldiers by protecting them againſt the exactions and injuſtice of their officers, and alſo by the example which he himſelf gave of ſubmiſſion to all rules of diſcipline which he had laid down. Nothing could be more abſtemious and hardy than his manner of living in the field, and he could boldly appeal to his aſſembled army whether he was ever diſtinguiſhed from thoſe who ſerved in the ranks, except by the mere circumſtance of command. He was not merely a ſoldier, but had thought maturely on ſubjects of civil adminiſtration, concerning which he would offer advice to the emperors under whom he ſerved. Such was the character of Niger, and ſo highly was he eſteemed by the ſenate and people, reſpected by the troops, and beloved by the province which he had governed with mildneſs and equity, that he ventured to declare himſelf a candidate for the empire, in the year 193, when the office of chief magiſtrate had been purchaſed by Didius Julianus. The army readily concurred in the deſign, and in conjunction with the citizens of Antioch, near which capital he then lay, ſaluted him emperor with loud acclamations. All the caſtern provinces recognized his elevation, and the ſurrounding ſatraps ſent their congratulations. He received offers of aſſiſtance from the kings and governors in alliance with the empire; but he declined all foreign aid, in the confidence that he ſhould meet with ſufficient ſupport from the ſubjects of Rome. This confidence proved his ruin. A formidable competitor declared himſelf; this was Septimius Severus, who was at the head of the legions in Illyria, and who poſſeſſed all the vigour and policy requiſite for a conteſt. Severus attacked the army of Niger under the command of Æmilianus, and entirely defeated it; after this, the conqueror attacked the emperor himſelf, and in an obſtinate conflict, drove Niger from the field, who, with a few of his friends, fled for ſafety beyond mount Taurus. He had, previouſly to this, fortified with great care the paſſes of this ridge between Cappadocia and Cilicia, and leaving them under a ſtrong guard, he went to Antioch to levy new forces. A violent ſtorm, attended with torrents of rain, overthrew the barriers raiſed on Taurus, and the enemy penetrated into Cilicia. Niger again faced them near the Iſſus, on the very ſpot in which Alexander gained a celebrated victory over Darius. He was again defeated with the loſs of 20,000 men, and fled from the field to Antioch, which he found full of conſternation. Without ſtopping, he continued his flight, intending to take refuge among the Parthians, but being overtaken by the enemy's cavalry, he was killed before he could reach the Euphrates. This happened in the beginning of the year 195. The ſanguinary victor took vengeance upon his wife and children, whom he cauſed to be maſſacred, together with all that bore the name of the unfortunate emperor. Univer. Hiſt.

NIGER, in *Geography*, a river of Africa, deſcribed by the Moors under the name of "Nel, or Neel, el Abeed," or the river of ſlaves, and "Neel Kibbeer," and called by the Negroes "Joliba," or the Great Waters, known in the country by the name of "Guin," or "Jin," which takes its riſe at a ſmall village denominated Sankari, in the high lands of Jallonkoodoo, about ſix days' journey S.W. from Bammakoo. From this moſt elevated point in the weſtern quarter of Africa, between the fifth and ninth degrees of W. longitude, the Niger and Gambia turn, in oppoſite directions, to the eaſt and weſt. Few geographical facts have been more queſtioned in modern times than the courſe of the great inland river of Africa, generally underſtood by the name of Niger; ſome deſcribing it to run to the *weſt*, and others to the *eaſt*. The authority of Mr. Park, the African traveller, whoſe fate has been much regretted, founded on ocular demonſtration, ſets this queſtion for ever at reſt, by determining the courſe of the river to be from *weſt* to *eaſt*, an opinion which had been anticipated by the information of another traveller, Mr. Houghton. Herodotus, more than twenty-two centuries ago, deſcribes, from the information of the Africans, a great river of Africa, far removed to the ſouth of the Great Deſert, and abounding with crocodiles. From him we learn, that it flowed from weſt to

eaſt, dividing Africa, in like manner as Europe is divided by the Danube. This ancient author farther aſſerts, that the people from the borders of the Mediterranean, who made the diſcovery, were carried to a great city on the banks of this river; and that the people of this quarter were *black*, that is, much blacker than their viſitors. Although Herodotus erroneouſly ſuppoſed this river to be the remote branch of the Egyptian Nile, and reaſons on this circumſtance accordingly; this argument ſerves to expreſs, in a more forcible manner, the ſuppoſed direction of its courſe. Pliny alſo believed that the Nile came from the weſt; but he is far from identifying it with the Niger, which he deſcribes as a diſtinct river, and he ſeems to afford us a probable concluſion reſpecting its courſe, for he ſpeaks of the "Bembotus" river as running into the Weſtern ocean, meaning to expreſs by it either the Gambia or Senegal river, and not the Niger. Ptolemy is poſitive in deſcribing the Niger as a ſeparate ſtream from the Senegal and Gambia; and his Niger is made to extend from weſt to eaſt, over half the breadth of Africa, between the Atlantic ocean, and the courſe of the Nile. It is not certain who ſtarted the oppoſite opinion reſpecting the courſe of this river. Edriſi, however, in the 12th century, not only conducted the "Nile of the Negroes," or Niger, *weſtward*, and into the Atlantic, but alſo derived it from the Egyptian Nile, in direct contradiction to the opinion of Herodotus. Abulfeda followed Edriſi in the ſame erroneous opinion reſpecting the Niger; which he calls a *twin* river with that of Egypt, and alſo the Nile of Ghana. The ſentiments of the moderns ſeem to have been chiefly adopted in deference to the authority of Edriſi. Accordingly, the early Portugueſe diſcoverers adopted the ſame idea, and having deduced their knowledge of the African geography from Arabian authors, afterwards ſet the faſhion in what related to this branch of geography. So that in deſpite of Ptolemy, and of the ancients in general, the great inland river of Africa was deſcribed to run to the weſt, and to form the head of the Senegal river: nay more, it was at laſt ſuppoſed to be the parent ſtock of all the great *weſtern* rivers of Africa. The ancient and true opinion with regard to the Niger has been revived, and in ſome meaſure eſtabliſhed by the reſearches conducted under the African aſſociation: in conſequence of theſe, and the ſubſequent reports of major Houghton and of Mr. Magra, the general poſition of the ſources of the Joliba, or Niger, have been referred to the country of Manding or its vicinity. Bammakoo has been placed near the higheſt navigable point of its courſe; Sego and Jenné have been repreſented as ſituated near its banks, and its waters as ſeparated into two channels, in the quarter of Tombuctoo. Mr. Park's obſervations have eſtabliſhed theſe poſitions, and the concluſion deduced from them. The Niger, from the place of its firſt riſe, appears to run near 100 miles in a northerly courſe, before it turns finally to the eaſtward, and its courſe is ſuch as to intercept all the ſtreams that deſcend from the Kong mountains on the ſouth. At the loweſt point to which Mr. Park traced this river, and which (although about 420 Britiſh miles in direct diſtance from its ſource) could only be reckoned the early part of its courſe, it was a very conſiderable body of water; the largeſt, he ſays, which he had ſeen (in Africa), and it abounded with crocodiles. The rainy ſeaſon was but juſt begun; and the river might have been forded at Sego, where its bed expands to a vaſt breadth. Still, however, ſays major Rennell, we muſt not eſtimate the bulk of the Niger, that Niger which was in contemplation of Pliny and the Romans, by the meaſure of its bulk at Sego and Silla. If we ſuppoſe it to be the ſame river which paſſes by Kaſſina, and we know of no other, which place is 700 miles, or more, to the eaſtward of Silla, it would doubtleſs receive by the way great additional ſupplies of water, and be at leaſt a much deeper river than where Mr. Park ſaw it. To Pliny it was well known, that the Niger ſwelled periodically, like the Nile, and at the ſame ſeaſon; and this fact is alſo proved by Mr. Houghton's report and by Mr. Park's obſervations. Pliny alſo ſays, that its productions were the ſame with thoſe of the Nile.

The Niger deſcends from the high level of Manding into Bambarra, on the eaſtward, with a rapid and furious courſe, at Bammakoo, about 150 miles below its ſource; after which it glides ſmoothly along, and affords an uninterrupted navigation to Houſſa, and probably by Kaſſina to Wangara; by the two firſt of which places, a very large and navigable ſtream does certainly paſs, under the ſame name as is applied by the Arabs and Moors to the Joliba, that is, Neel Abeed, or river of ſlaves; a name that marks the idea of the people of the country through which it flows, in the minds of that people.

The courſe of the Niger, or Joliba, is eſtabliſhed, by ocular demonſtration, as far as Silla; and may alſo be admitted as far as Houſſa, about 400 miles farther to the eaſt, on the foundation of the information collected by Mr. Park, with which the reports of Mr. Magra and major Houghton agree. Thus, the firſt 700 geographical miles of its courſe are from *weſt* to *eaſt*, or rather from W.S.W. to E.N.E. It appears from various authorities, that the waters of the Niger are continued from Manding to Wangara: as far as Silla its courſe is to the eaſtward, and, without doubt, continues in the ſame direction to Houſſa, 400 miles farther to the eaſtward, if we may depend upon Mr. Park's information. Other teſtimonies are alſo decidedly in favour of an eaſterly courſe of the Niger from Houſſa to Wangara. The only remaining queſtion pertains to its termination. Many circumſtances concur to prove that the Joliba or Niger terminates in lakes in the eaſtern quarter of Africa; and thoſe lakes ſeem to be ſituated in *Wangara* and *Ghana;* which ſee reſpectively. That it does not form the *upper part* of the Egyptian Nile, may be inferred from two circumſtances; firſt, the great difference of level that muſt neceſſarily exiſt between the Niger and the Nile, admitting that the Niger reached the country of Abyſſinia. For by that time it would have ran at leaſt 2300 geographical miles, in a direct line; and near 2000 after it had deſcended to the level of the Sahara, or Great Deſert. And the Nile, at the point where the White river, (which alone can be taken for the Niger, if the above ſuppoſition be admitted,) falls in, has more than a thouſand ſuch miles to run before it reaches the ſea; and has, moreover, two or more cataracts to deſcend in its way: not to add here, that Abyſſinia is a very elevated tract. The ſecond circumſtance is, that the Niger, throughout the tract of Nigritia, in common with all the rivers of that region, ſwells with the periodical rains, and is at its higheſt pitch, when the Nile is under the like circumſtances in Egypt. Now, conſidering how long a time it would require for the waters of Nigritia to reach Egypt, the effect ought ſurely to be, that inſtead of what happens at preſent, the Nile ought to be kept up to nearly its higheſt pitch, a very long time after the Niger. But without farther enlarging, it is certain, that if the eaſtern waters do not run into the Nile, (of which there does not appear a ſhadow of probability,) they muſt either be evaporated in lakes, or loſt in ſands. The lake of Kauga offers itſelf in a poſition very convenient for the purpoſe, and a river taken by Edriſi for the Niger, is actually ſaid to paſs near it. Moreover, Agathemerus and Ptolemy concur in deſcribing the rivers of interior Africa as terminating as well as beginning

ginning within the continent. Among the eaſtern waters, the "Gir" of Ptolemy ſeems to be recognized in the river of Bornou, and its adjuncts; and the Niger in that of Tombuctoo and Wangara. The Panagra of the ſame geographer anſwers to Wangara; and his Libya Palus, which forms the termination of the Niger eaſtward, ſeems to be meant either for the largeſt of the lakes, or for the lakes of that country, of which there are ſeveral, collectively. Rennell's Proceedings of the African Aſſociation, paſſim. See GUIN and JOLIBA.

NIGHT, that part of the natural day, during which the ſun is underneath the horizon: or, night is that ſpace of time wherein the ſun is out of our hemiſphere.

Under the equator, the nights are always equal to the days. Under the poles, the night continues half a year.

The ancient Gauls and Germans divided their time not by days, but nights; as appears from Tacitus and Cæſar; and the people of Iceland and the Arabs do the ſame at this day. See DAY, HOUR, &c.

The ſame is alſo obſerved of our Saxon anceſtors.

Thus in the council of Cloveſhoe, anno 824, we read, "Ibi finita et proſcripta contentione coram epiſcopo poſt 30 noctes, illum juramentum ad Weſtminſter deductum eſt." —Whence our cuſtom of ſaying, *ſevenight*, *fortnight*, &c.

NIGHT, *Signals by*. See SIGNALS.

NIGHT-*awn-hynd*, *Third*. See THIRD.

NIGHT-*mare*. See INCUBUS.

We ſhall here obſerve that the term "night-mare" is derived from *Mara*, which in the Runic theology of the ancient Scandinavians, was a ſpirit or ſpectre of the night, that ſeized men in their ſleep, and ſuddenly deprived them of ſpeech and motion. See Keyſler, Antiquit. Sel. Septentrional, cited by Warton, in his Hiſt. of Eng. Poetry, vol. i. diſſ. 1.

NIGHT-HAWK, in *Ornithology*. See CAPRIMULGUS *Europæus*.

NIGHTINGALE, *Luſcinia* or *Philomela*, the browniſh-grey motacilla, with the annules of the knees grey. See MOTACILLA *Luſcinia*.

The nightingale derives its name from *night*, and the Saxon word *galan*, *to ſing*.

Mr. Hunter found, by diſſection, that the muſcles of the larynx are ſtronger in the nightingale than in any other bird of the ſame ſize.

This bird, the moſt famed of the feathered tribe, for the variety, length, and ſweetneſs of its notes, viſits England in April or May, and leaves us in Auguſt; and during its continuance with us, its range is confined to a part of this iſland: it is not found in Scotland, Ireland, or North Wales, nor in any of the northern countries, except Yorkſhire; and it does not migrate ſo far to the weſt as Devonſhire and Cornwall. Nightingales form their neſts of oak leaves, a few bents, and reeds. The eggs are of a deep brown. They begin their ſong in the evening, and continue it the whole night. Pennant.

NIGHTINGALE, *American*, of Edwards. See MOTACILLA *Calidris*.

NIGHTINGALE, *Mock*, or *Black-cap*. See MOTACILLA *Atricapilla*.

NIGHTINGALE, *Virginian*, the common, but improper name of a bird of the groſs-beaked kind, called by authors the *coccothrauſtes indica criſtata*: it is brought to us from Virginia, and is much valued in England for its beauty and delicate manner of ſinging; it is very fond of almonds and the like fruits. See LOXIA *Cardinalis*.

NIGHTINGALE *Iſland*, in *Geography*, a ſmall iſland in the Eaſt Indian ſea, near the S. coaſt of Madura. S. lat. 7° 15′. E. long. 114°.—Alſo, a ſmall iſland in the South Atlantic ocean, of an irregular form, with a hollow in the centre, about ſeven or eight miles in circumference. At its ſouthern extremity are ſome rocky iſlets, and on the N.E. coaſt is anchorage. S. lat. 37° 29′. W. long. 11° 48′.

NIGHTSHADE, in *Botany*. See SOLANUM.

NIGHTSHADE, *Garden*, *Solanum nigrum*, in the *Materia Medica*, is common about rubbiſh, dunghills, and in neglected gardens, producing its flowers during all the ſummer months. Its ſmell is faint and diſagreeable; but, being ſimply herbaceous, it manifeſts no peculiar flavour to the taſte. It appears to poſſeſs the deleterious qualities of the other nightſhades, in a very conſiderable degree; its odour being, as it is ſaid, ſo powerfully narcotic as to cauſe ſleep. The berries are equally poiſonous with the leaves. Three children, upon eating them, were ſuddenly ſeized with cardialgia and delirium, accompanied with ſpaſms, and remarkable diſtortions of the limbs; and to poultry they proved fatal in a ſhort time. The plant, or rather the leaves, which were boiled and eaten by a mother and four children, produced ſwellings of the face and limbs, followed by inflammation and gangrene; but the huſband, who likewiſe ate of this vegetable at the ſame time, found no conſequent diſorder. Its deleterious effects appear ſtill more certain from the experiments of Meſſrs. Gataker and Bromfield; the latter aſſerting that in doſes of one grain it had a mortal effect upon one of his patients. However, Dioſcorides and Theophraſtus mention it as an eſculent plant, and Guerin, cited by Woodville, relates, that he drank an infuſion of fifteen grains of the Solanum nigrum without ſuffering, in conſequence of it, any complaint: and that an epileptic patient took from half a dram to two drams of the expreſſed juice of the plant, without perceiving any narcotic ſymptoms; nor with ſome ſoldiers, to whom a ſtill larger doſe was given, together with two drams of the juice of the berries, was any other effect produced, than that of an increaſed quantity of urine. As this ſpecies of nightſhade is ſuppoſed to be the Στρυχνος κηπαιος of Dioſcorides, its external uſe was reſorted to in ancient times as a diſcutient and anodyne in various affections of the ſkin, tumefactions of the glands, ulcers, and diſorders of the eyes; nor does the utility of this practice want the confirmation of later experience. With the Arabians it is a common application to burns and ulcers; and Ray alſo expreſſes a high opinion of its effects in indurations of the breaſt. The writings of the ancients afford little evidence of its internal uſe; though, according to Cæſalpinus, it appears not to have been wholly neglected. The attention of the faculty was directed to this plant in the year 1757, by Mr. Gataker, ſurgeon to the Weſtminſter hoſpital, by a publication recommending its internal uſe in old ſores, ſcrofulous and cancerous ulcers, cutaneous eruptions, and even in dropſies; all of which were much relieved, or completely cured, by the ſolanum. From his experiments it appears, that one grain of the dried leaves of the plant, infuſed in an ounce of water, ſometimes produced a conſiderable effect; that in the doſe of two or three grains it ſeldom failed to evacuate the firſt paſſages, or to increaſe very ſenſibly either the diſcharge by the ſkin, or that by the kidnies, and it not unfrequently occaſioned headache, giddineſs, dimneſs, and drowſineſs. Mr. Bromfield, who ſoon afterwards publiſhed a pamphlet on the ſame ſubject, declares, that the caſes in which he tried the ſolanum were much aggravated by it, and he therefore contends that the uſe of it is prejudicial and dangerous. Judging from the diſuſe of the ſolanum, ſince the termination of this controverſy, the opinion of Mr. Bromfield ſeems to be tacitly con-

firmed. Afterwards, *viz.* in 1764, Mr. Gataker aſcribed the efficacy of nightſhade, not to any ſpecific power, but to the evacuation produced by it. Lewis. Murray. Woodville.

NIGHTSHADE, *American*, in *Botany*, &c. See PHYTOLACCA.

NIGHTSHADE, *Baſtard*. See RIVINA.

NIGHTSHADE, *Deadly*. See ATROPA.

NIGHTSHADE, *Deadly*, in the *Materia Medica*. (See ATROPA.) Sauvages (Noſol.) ſuppoſes that the belladonna was the plant which produced ſuch ſtrange and dreadful effects upon the Roman ſoldiers, during their retreat, under the command of Antony, from the Parthians: they are ſaid by Plutarch to have ſuffered great diſtreſs for want of proviſions, and were urged to eat unknown plants; among others, they met with an herb that was mortal; he that had eaten of it loſt his memory and his ſenſes, and employed himſelf wholly in turning about all the ſtones he could find, and, after vomiting up bile, fell down dead. Shakſpeare in his Macbeth makes Banquo ſay,

> "Or have we eaten of the inſane root
> That takes the reaſon priſoner."

There is a remarkable inſtance of the direful effects of this plant recorded in Buchanan's Hiſtory of Scotland; wherein he gives an account of the deſtruction of the army of Sweno, when he invaded Scotland, by mixing a quantity of the juice of theſe berries with the drink which the Scots, by their truce, were to ſupply them with: this ſo intoxicated the Danes, that the Scots fell upon them, in their ſleep, and killed the greateſt part of them; ſo that there were ſcarcely men enough left to carry off their king. See on this article, Phil. Tranſ. vol. lx. part i. p. 62.

NIGHTSHADE, *Enchanter's*, in *Botany*. See CIRCÆA.

NIGHTSHADE, *Malabar*. See BASELLA.

NIGHTSHADE, *Three-leaved*, or Herb Puris of Canada. See TRILLIUM.

NIGHTSHADE, *Woody*, called *Bitter-ſweet*. See SOLANUM *Dulcamara*.

NIGHTSHADE, *Woody*, *Dulcamara*, in the *Materia Medica*, is a plant which grows plentifully by the ſide of hedges and in moiſt ditches, climbing upon the buſhes, with winding, woody, but brittle ſtalks. It is perennial, and flowers in June and July. The roots and ſtalks of this ſpecies, which, on firſt chewing them, yield a conſiderable bitterneſs, that is ſoon followed by an almoſt honey-like ſweetneſs, have been commended in different diſorders, as high reſolvents and deobſtruents.

Experience, ſays Dr. Lewis, has ſhewn that they are by no means equally deleterious with deadly nightſhade; that they act more regularly and uniformly; and that, without producing nervous complaints, they produce more conſiderable evacuations, eſpecially by ſtool: but, he adds, that their virtues, in particular caſes, have not yet been ſufficiently aſcertained. The younger branches, on extreme twigs, either freſh or dried, in which latter caſe their powers are ſomewhat diminiſhed, are the parts employed; and their ſenſible qualities are ſaid to be the ſtrongeſt in Autumn, when the leaves are fallen; and, therefore, they ſhould be gathered at this ſeaſon rather than in ſpring. Boiling water extracts their whole active matter; but their virtues are deſtroyed by much motion. Scheele found that they contain citric acid. Dulcamara is very generally admitted to be a medicine of very conſiderable efficacy. Murray ſays, that it promotes all the ſecretions; Haller obſerves, that it partakes of the milder powers of the nightſhade, joined to a reſolvent and ſaponaceous quality; and the opinion of Bergius ſeems to coincide with that of Murray. This author confines its uſes to rheumatiſmus, retentio menſium et lochiorum. It appears alſo, by the experiments of Razoux, and others, to have been uſed with advantage in ſome obſtinate cutaneous affections. Dr. Cullen ſays, that he has employed a decoction of the ſlender twigs in the cure of rheumatiſm, ſometimes with advantage, but at other times without any effect: he adds, that the dulcamara, in all his trials, has hardly ever been obſerved to be in any meaſure diuretic. Of the various diſeaſes in which it has been recommended, the chief inſtances enumerated by Haller and Murray are, phthiſis, lues venerea, peripneumonia notha, ſcorbutus, icterus, aſthma, &c. on the authority of Boerhaave, Sauvages, Sager, and others. Mr. Thomſon, in his "London Diſpenſatory," ſays, that it has been found uſeful in humoral aſthma, dropſy, chronic rheumatiſm, and in lepra vulgaris and alphos, pſora, and ptyriaſis. Willan ſays, that it is not applicable for the cure of lepra nigricans, and Mr. Thomſon aſſerts, that it is not of the leaſt uſe in acute rheumatiſm, nor, as he conceives, in fluor albus and ſuppreſſion of the menſes, in which caſes it has been ſtrongly recommended. This plant is generally given in decoction or infuſion, and ſometimes in the ſubſtance pulverized; and to prevent its exciting nauſea, it is ordered to be diluted with milk, and to begin with ſmall doſes, as large doſes have been found to produce very dangerous ſymptoms, ſuch as vomiting, convulſions, and delirium, violent palpitation, and a palſy of the tongue. Razoux gives the following preſcription; ℞ Stipitum dulcam. rec. drac. ſſ. in aquæ font unc. 16 coquatur ad unc. 8. This was taken in the doſe of three or four drams, diluted with an equal quantity of milk every four hours. Linnæus directs two drams or half an ounce of the dried ſtipites to be infuſed half an hour in boiling water, and then to be boiled ten minutes; and of this decoction he gave two tea-cups full morning and evening. In the London Pharmacopeia the decoction is directed to be prepared by boiling down one ounce of the ſtalks ſliced in one and a half pint of water to a pint and ſtraining. The doſe is from ʒiv. to ʒj, combined with any aromatic tincture, given thrice a day. The extract of belladonna is prepared by bruiſing a pound of the freſh leaves in a ſtone-mortar, ſprinkling over them a little water; then expreſſing the juice, and, without any ſeparation of the ſediment, evaporating it to a proper conſiſtence. The inſpiſſated juice of the Edinburgh Pharmacopeia is prepared by bruiſing the freſh leaves, incloſing them in a hempen bag, and preſſing them ſtrongly, until they yield their juice, which is to be evaporated in flat veſſels, heated with boiling water ſaturated with muriate of ſoda (common ſalt), and immediately reducing to the conſiſtence of thick honey: and when the maſs is cold putting it into glazed earthen veſſels, and moiſtening with alcohol. The medicinal properties of this extract are the ſame as thoſe of the plant, but weaker. The doſe is from gr. j. gradually increaſed to grs. v., given in the form of pills. The doſe of the powder may be from grs. x. to ʒi, taken in a cupful of milk. The berries have not yet been applied to medical uſe. They ripen in September and October; they are very juicy, bitter, and poiſonous. As they are very common in the hedges, and may be eaſily miſtaken by children for red currants, which they ſomewhat reſemble, their deleterious effects are the more worthy of notice. Lewis. Mat. Med. Woodv. Med. Bot.

NIGHTWALKERS, in a *legal* ſenſe, are ſuch perſons as ſleep by day and walk by night, being oftentimes pilferers or diſturbers of the peace.

5 Ed. III. cap. 14. Conſtables are authoriſed by the common

mon law to arreſt nightwalkers, and ſuſpicious perſons, &c. Watchmen may alſo arreſt nightwalkers, and hold them until morning: and, it is ſaid, that a private perſon may arreſt any ſuſpicious nightwalker, and detain him till he give a good account of himſelf. (2 Hal. P.C. 98.) One may be bound to the good behaviour for being a nightwalker; and common nightwalkers and haunters of bawdy-houſes are to be indicted before juſtices of peace, &c. But it is held not lawful for conſtable, &c. to take up any woman, as a nightwalker, on bare ſuſpicion only of being of ill fame, unleſs ſhe be guilty of a breach of the peace, or ſome other unlawful act.

NIGHTWALKERS, in a *phyſical* ſenſe. See NOCTAMBULATIO.

NIGIDIUS FIGULUS, PUBLIUS, in *Biography*, one of the moſt learned men of ancient Rome, the contemporary and friend of Cicero, was a profeſſed advocate for the doctrines advanced and defined by Pythagoras. He is repreſented by Cicero as an accurate and penetrating enquirer into nature, and as one to whom is to be aſcribed the revival of that philoſophy which had formerly flouriſhed for ſeveral ages in the Pythagorean ſchools, both in Italy and Sicily. He was alſo a conſiderable proficient in mathematical and aſtronomical learning, but like his maſter applied the knowledge of nature to the purpoſes of impoſture. He held frequent diſputations with Cicero and his friends on philoſophical ſubjects. His attachment to ſcience did not prevent him from engaging in civil affairs, and aſpiring to poſts of honour and authority in the ſtate. Cicero was indebted to him for conſiderable aſſiſtance in unravelling and defeating Cataline's conſpiracy, and he alſo received important ſervices from him in the time of his adverſity. Nigidius, in the civil war between Pompey and Cæſar, attached himſelf to the party of the former, and upon Cæſar's acceſſion to the ſupreme power, he was baniſhed from Rome, and died in a ſtate of exile. He wrote ſeveral books on various ſubjects, of which fragments only have come to our hands, which may be ſeen in the "Variæ Lectiones" of Janus Rutgers: and in the "Comment. de Hiſt." by Anthony Ricoboni. After the time of Nigidius the Pythagorean doctrine was much neglected, few perſons being able to decypher, with accuracy, the obſcure dogmas of this myſterious ſect. Enfield's Hiſt. of Phil. vol. ii. Univer. Hiſt.

NIGLARIEN, in *Greek Muſic*, the name of a languid and effeminate nome or chant, with which Ariſtophanes reproaches its author, Philoxenes.

NIGONO, in *Geography*, a town of Italy, in the department of the Panaro; 22 miles S.W. of Modena.

NIGRINA, in *Botany*, a name alluding to the univerſal blackneſs aſſumed by the plants in drying, has been applied by Thunberg to two very different things, the MELASMA of Bergius, and the CHLORANTHUS of Swartz; ſee thoſe articles.

NIGRITIA, in *Geography*. See NEGROLAND.

NIGRITIES OSSIUM, among the ancients. See CARIES.

NIGUMBO, in *Geography*. See NEGOMBO.

NIHIL, NIHILUM, *Nothing*, among the ſchool philoſophers, is what has no real eſſe, and which is only conceived negatively, and denominated by a negative.

NIHIL *Capiat per Billam*, or *per breve*, in *Law*, is a form uſed when judgment is given againſt the plaintiff, ſo as to bar his action, or overthrow his writ or bill.

NIHIL, or *Nil debet*, is the uſual plea in an action of debt; but it is no plea in an action of covenant, or breach aſſigned for non-payment of rent, &c.

NIHIL *Dicit* is a failing of a defendant to put in an anſwer to the plaintiff's plea by the day aſſigned; on which omiſſion judgment is given againſt him of courſe, *quod nihil dicit*, becauſe he alleges nothing to the contrary.

NIHIL, or *Nihili album*, in *Botany*. See POMPHOLYX.

NIHILS, or NICHILS, in *Law*, iſſues which the ſheriff, that is appoſed in the exchequer, ſays are nothing worth, and illeviable; from the inſufficiency of the partics that ſhould pay them.

NIHILS, *Clerk of the, nihilorum clericus*. See CLERK and EXCHEQUER.

NIJAR, in *Geography*, a town of Spain, in the province of Granada; 12 miles N.E. of Almeria.

NIKA, a town of Perſia, in Mazanderan; 15 miles S.E. of Fehrabad.

NIKALINZIN, a town of Poland, in Galicia; 44 miles S. of Halicz.

NIKERA, a river of Guiana, which runs into the Atlantic, N. lat. 6°. W. long. 57° 20'.

NIKIA, a town of European Turkey, in Macedonia; 26 miles S.E. of Akrida.

NIKIOPING, or NYKOPING, *i. e. New Mart*, a ſea-port of Sweden, and capital of Sudermanland, ſituated at the mouth of a river, near the Baltic. The town is well built, and is one of the moſt ancient cities in Sweden, having formerly been the reſidence of the kings and princes of Sudermanland. Its air is ſo mild and ſalubrious, that the court and its attendants have removed hither from Stockholm in a time of contagion. The number of its inhabitants exceeds 12,000; and the city is nearly biſected by a large river, over which a ſtone bridge was erected in 1728. This town, which has ſuffered much by fire, the ravages of the Ruſſians, and the decays of time, has two handſome churches, a commodious harbour, ſeveral manufactories of cloth and Morocco leather, a braſs hammer-mill, and carries on a conſiderable trade by ſea. Its chief magiſtrates are two burgo-maſters. The governor of Sudermanland reſides in this city. The Swediſh language is ſuppoſed to be ſpoken in its greateſt purity at Nikioping and its vicinity. Without this town is a royal encloſure, and the adjacent country is very fertile; 50 miles S.W. of Stockholm. N. lat. 58° 45'. E. long. 16° 53'.

NIKITSK, a town of Ruſſia, in the government of Moſcow; 20 miles S.E. of Moſcow.

NIKLE', a town of Egypt, on the left branch of the Nile; 10 miles S. of Faoué.

NIKMID, or NICKMID. See ISMID.

NIKOLAEVSKOI, a town of Ruſſia, in the government of Vologda; 36 miles S.E. of Totma.—Alſo, a town of Ruſſia, in the government of Tobolſk, on the Undebs; 60 miles E.S.E. of Tomſk.—Alſo, a town of Ruſſia, in the laſt-named government; 72 miles S.E. of Eniſeiſk.

NIKOLAI, or NIKOLOW, a town of Sileſia, in the lordſhip of Pleſz; 12 miles N. of Pleſz. N. lat. 50° 8'. E. long. 18° 50'.

NIKOLAJEV, a town of Ruſſia, in the government of Ekaterinoſlav, on the Ingul, near the Bog. This town was founded in 1791, and has ſince increaſed ſo rapidly, that the admiralty has been removed hither from Cherſon; 63 miles N.W. of Cherſon. N. lat. 46° 54'. E. long. 31° 55'.

NIKOLSK, a town of Ruſſia, in the government of Vologda, and province of Uſting, on the Jug; ſix miles S. of Uſting. N. lat. 59° 55'. E. long. 45° 34'.

NIKOLSKOI, a town of Ruſſia, in the government of Archangel; 52 miles W.S.W. of Archangel.—Alſo, a town of Ruſſia, in the government of Archangel, on the Onega; 72 miles S.E. of Oneg.—Alſo, a town of Ruſſia, in the

government

government of Archangel; 52 miles S. of Mezen.—Alſo, a town of Ruſſia, in the government of Vologda; 24 miles S.S.E. of Vologda.—Alſo, a town of Ruſſia, in the government of Upha, on the Ural; 80 miles E.S.E. of Orenburg.—Alſo, a town of Ruſſia, in the government of Tobolſk; 40 miles N. of Tomſk.

NIKSAR. See NICSAR.

NIL, in *Botany*, a name given by the Arabians to two very different ſeeds, which are often, by this means, miſtaken in their writings one for another. Avicenna tells us, firſt, that nil is the ſeed of a creeping plant, of the bindweed kind, and that this plant had blue flowers, like the campanules, or bell-flowers; but, in another place, he tells us, that nil is the name of a plant uſed in dyeing, which ſeems to be the ſame with our *iſatis*, or woad.

It is probable, that the convolvulus, or bindweed, called nil, obtained this name only from its flower being of the ſame colour with the fine blue pigment obtained from the other nil, or woad.

NIL *habuit in tenementis*, in *Law*, a plea to be brought in an action of debt only, brought by a leſſor againſt a leſſee, for years, or at will, without deed.

NILAB, in *Geography*, a name given to the river Indus, or Sinde, in Thibet.

NILACUNDI, in *Natural Hiſtory*, a name given to a ſtone of the gem kind, which is half a ſapphire and half a ruby.

The word *nilaa* is the Indian name for the ſapphire, derived from the word *nil*, the name of indigo, and given to this gem becauſe of its fine blue colour, which approaches to the tinge of the pigment. The latter part of the word is not eaſily accounted for, without making a little variation in the ſpelling, but with that, is very clear and eaſy. *Jacut*, or *jacuti*, and, as ſome ſpeak it, *jacunti*, is the name given by the Indians to the ruby, and it is only ſuppoſing the word to be properly *niljacunti*, and it expreſſes, in their own language, exactly what we underſtand by it, a ſtone part ſapphire and part ruby.

NILAHUMATU, in *Botany*, a name given by ſeveral authors to the ſmooth-fruited ſtramonium of Malabar.

NILAS, in *Geography*, a town of Mexico, in the province of Culiacan; 50 miles N.E. of Culiacan.

NIL-CUND, a town of Thibet; 75 miles N. of Catmandu. N. lat. 29° 18'. E. long. 84° 57'.

NILE, a famous river of Africa, which riſes in the Gebel-el-Kumr, or mountains of the moon, in a diſtrict called *Donga*, (which ſee,) N. lat. 8°. It is firſt known by the name of BAHR *el-Abiad*, (which ſee,) or the White river, and about N. lat. 16 is joined by the BAHR-*el-Azrek*, (which ſee,) or the Blue river; the former tinged, and the latter clear, as is the caſe with reſpect to the Maranon and the Miſſouri; and which after ſeveral windings and turnings, and being united with various other ſtreams, enters Egypt at Aſſouan or Syene. In its courſe it waſhes the walls of many cities and towns, and having divided Egypt into two parts, it diſcharges itſelf by ſeven mouths into the Mediterranean, N. lat. 31° 25'. The comparative courſe of the Nile may be eſtimated at about 2000 Britiſh miles, thus rivalling the longeſt Aſiatic rivers, and being only exceeded by the Ob, Kian-ku, and Hoan-ho, and alſo by the Maranon, and probably by the Miſſouri. This river forms ſome conſiderable cataracts, the chief of which is that of Granadil in Nubia, N. lat. 22°, before it gains the level of Egypt, after paſſing ſome rapids to the S. of Syene. Alvarez has long ago obſerved, that the riſe of the Nile in Egypt is occaſioned by the violent rains, which, during the ſummer, deluge the ſouthern regions; and he might alſo have added the melting of the ſnow on the African alps, which give ſource to the real Nile, or Bahr-el-Abiad; for as the Atlas is covered with perpetual ſnow, which alſo crowns the Andes under the equator, it is probable, that the central ridge of Africa preſents the ſame features, and that an ancient geographer might have been frozen to death in his torrid zone. Beſides, Abyſſinia, through which the Abyſſinian Nile, or Bahr-el-Azrek paſſes, is one of the moſt mountainous and precipitous countries in the world. The fertility of Egypt, which is for the greateſt part a narrow vale, through which the Nile paſſes, has been generally aſcribed to the inundations of this river; but this is applicable in a ſtrict ſenſe only to parts of the Delta; whereas, in other diſtricts there are canals, and the adjacent lands are generally watered by machines. Mr. Gray's deſcription of Egypt, as immerſed under the influx of the Nile, though exquiſitely poetical, is far from being juſt. In Upper Egypt the river is confined by high banks, which prevent any inundation into the adjacent country. This is alſo the caſe in Lower Egypt, except at the extremities of the Delta, where the Nile is never more than a few feet below the ſurface of the ground, and where of courſe inundation takes place. But the country, as we may imagine, is without habitations. The fertility of Egypt, ſays Mr. Browne, the intelligent and obſerving traveller now cited, ariſes from human art. The lands near the river are watered by machines; and if they extend to any width, canals have been cut. The ſoil in general is ſo rich as to require no manure. It is a pure black mould free from ſtones, and of a very tenacious unctuous nature. When left uncultivated, fiſſures have been obſerved, ariſing from extreme heat, of ſuch depth that a ſpear of ſix feet could not reach the bottom. Rain in Egypt is a very uncommon phenomenon; the heat alſo is extreme, particularly from March to November; and as a ſupply of water was ſo deſirable, we need not wonder that the uſual period of the Nile's inundation ſhould be expected with ſo much anxiety, and that inſtruments ſhould be conſtructed for meaſuring its increaſe. (See NILOMETER.) Until the ſummer ſolſtice, this increaſe is not much perceived, but it continues advancing till near the end of Auguſt, and often even in September. The greateſt breadth of this majeſtic river may be computed at 2000 feet, or about one-third of a mile. Its motion is even ſlower than that of the Thames, and does not exceed three miles an hour. The water is always muddy; in April and May, when it is cleareſt, it has ſtill a cloudy hue; when it overflows, the colour is a dirty red. It is purified before it is drank; and for this purpoſe bitter almonds pulverized are mixed in a jar of water, and turned about for ſome minutes: it is then left to ſettle, and in five or ſix hours the heterogeneous particles ſubſide to the bottom of the veſſel, and the water becomes limpid and excellent. The Nile abounds with a variety of fiſh; ſuch as the bûlti or labrus niloticus, kelb-el-bahr, farbân, charmût, a round fiſh about eight inches long, and ſaid to be poiſonous, taban-el-bahr, or eel, *i. e.* muræna anguilla, and nefâſh, apparently a ſpecies of ſalmon, and found of a very large ſize. The oxyrynchus is alſo famous in the antiquities of Egypt, and according to D'Anville is the fiſh now called keſhee. The beſt is the bûlti, ſomewhat like the white trout, but ſometimes attaining to the weight of fifty pounds. Except good and large eels, none of the fiſh have a ſtrict ſimilitude of the European. Among ſeveral kinds of water-fowl which frequent the Nile, we may mention the large fowl, here called the Turkey gooſe, or Anas nilotica, the fleſh of which is palatable and ſalubrious food. From Cairo to Aſſouan,

Aſſouan, about 360 miles, the banks, except where they are rocky, preſent no natural plant; they ſomewhat reſemble the ſteps of ſtairs, and are ſown with all ſorts of eſculent vegetables, chiefly that uſeful plant the "bamea," which grows to little more than three feet in height, with leaves like thoſe of the currant-buſh, and produces oblong aculeated pods, which yield a pleaſant flavour to the repaſt. Other ſtriking and ancient features of this diſtinguiſhed ſtream, are the rafts of "belaſſes," or large white jars, uſed for carrying water; little rafts of gourds, in which a ſingle perſon conducts himſelf with great philoſophical dignity acroſs the ſtream; and the divers who, concealing their heads in pumpkins, approach the water-fowl unperceived, and ſeize them by the legs. The hippopotamus Mr. Browne never ſaw or heard of in Egypt; in Nubia they are ſaid to abound. The crocodiles are reduced in number, and are confined to the diſtrict above Aſſiût, where they are dangerous to bathers. It is not caſy, we are told, to conceive a more pleaſurable mode of travelling than that by the Nile when it overflows. The great body of water, perfectly calm and unruffled, the banks on each ſide covered with the rich product of the huſbandman's labour, form a ſcene in every ſenſe alluring. The paſſengers are protected by a ſimple awning of branches from the immediate action of the ſun, and the great heat of the tropical latitude is aſſuaged by a gentle breeze, which generally continues during four or five meridian hours. The mariners chant reſponſive to the motion of their oars; and the veſſel offers an apt emblem of ſmiling fortune in her moſt proſperous career. The narrow vale through which the Nile purſues its courſe in Egypt, is bounded on either ſide with barren rocks and mountains. The towns and cultivation are chiefly on the eaſtern bank; behind which are vaſt ranges of mountains extending to the Arabian gulf, abounding with marble and porphyry, but almoſt deſtitute of water, and inhabited only by Bedouins. Acroſs theſe mountains is a ſolitary road to Coſſeir on the Red ſea. On the weſt the hills lead to a vaſt ſandy deſert, in which are the two Oaſes, a name applied to iſlands ſituated in ſand.

The ſources of the Nile, and the cauſes of its inundation and fertilizing powers, have been ſubjects of ſpeculation and of hiſtorical detail from almoſt the remoteſt period of antiquity. Our limits forbid our entering on a detail of the different conjectures of ancient writers; eſpecially as we have obtained more ſatisfactory information with regard to theſe particulars from modern travellers. Thoſe who wiſh to acquaint themſelves with the opinions of the ancients, may conſult Herodotus, Diodorus Siculus, Strabo, and Pliny. (See DELTA, EGYPT, and NILOMETER.) The Nile during the three months of its inundation ſupplies Egypt, without the aid of rain, with a ſufficient quantity of water for the reſt of the year; and as it thus facilitates, or rather in a conſiderable degree ſuperſedes labour, it has been ſtyled the ſource of plenty and happineſs, and even of life itſelf. If Albuberque, the Portugueſe, had been able to execute his project of turning its courſe from Ethiopia into the Red ſea, this country, which is now ſo rich, would have become a ſavage deſert, ſurrounded by ſolitudes. We need not wonder, therefore, that the Egyptians ſhould always have profeſſed, and that they ſhould ſtill retain a kind of religious veneration for the Nile. They have called it holy, bleſſed, and ſacred: and on the appearance of the new waters, that is, on the opening of the canals, mothers are ſeen plunging their children into the ſtream, from a belief that theſe waters have a purifying and divine virtue, ſuch as the ancients are ſaid to have attributed to every river.

The Nile was reckoned in the number of the great gods of the Egyptians. To this beautiful river they gave the name of Oceanus, Ypeus, and Nilus; and it was alſo denominated Siris, which, by abbreviation, is the ſame name with Oſiris, becauſe in reality it repreſented that god. Of all the feſtivals they celebrated in honour of this river, that of opening the canals, at the time of its inundation, was the moſt ſolemn and magnificent. At this feſtival the ancient kings of Egypt aſſiſted in perſon, accompanied by their miniſters, by all the grandees of the kingdom, and by an innumerable multitude of people. They anticipated their obligations to this river for the benefits which its inundation was to produce, by throwing into it, in the form of ſacrifice, barley, corn, ſugar, and other fruits. It is ſaid that on this joyful occaſion, they made a ſacrifice of a young virgin, whom they drowned in this river. A cuſtom ſtill ſubſiſting at this day, ſays Savary, ſeems to prove that the Egyptians formerly ſacrificed a young virgin to the god of the Nile; for they now make a ſtatue of earth in the ſhape of a girl, to which they give the name of "the betrothed bride," upon the dyke of the "Khalig of the Prince of the Faithful," which they throw into the river previouſly to the opening of the canal. At the feſtival, when this cuſtom is obſerved, the pacha deſcends from the caſtle, accompanied by his whole court, and repairs in pomp to Foſtat, where the canal commences that traverſes Grand Cairo. (See CAIRO.) He places himſelf under a magnificent pavilion, prepared at the head of the dyke. The beys, preceded by their muſic, and followed by their mamelukes, compoſe his retinue: the chiefs of their religion appear mounted on horſes richly capariſoned. All the inhabitants on horſeback, on foot and in boats, are anxious to aſſiſt at this ceremony. The land and the water are covered by upwards of 300,000 men. The boats are in general agreeably painted, well carved, and ornamented with canopies and flags of different colours. Thoſe of the women are diſtinguiſhed by their elegance, their richneſs, the gilded columns that ſupport the canopy, and above all, by the blinds let down over the windows. Every body remains ſilent until the moment when the pacha gives the ſignal. In an inſtant the air is filled with ſhouts of joy, the trumpets ſound a flouriſh, and the timbrels and other inſtruments reſound from every ſide. When the dam is deſtroyed, and the waters flow towards Grand Cairo, the viceroy throws into the canal pieces of gold and ſilver, which are picked up by ſkilful divers. During the amuſements of this day the inhabitants ſeem to be in a ſtate of intoxication. Mutual compliments and congratulations paſs, and on every ſide are heard ſongs of thankſgiving. A crowd of dancing girls run along the banks of the Khalig, and enliven the ſpectators by their laſcivous dances. The ſucceeding nights, after the canal has filled the great ſquares of the capital, afford more agreeable ſpectacles. In the evening each family is collected in boats, ornamented with carpets and rich cuſhions; the ſtreets, the moſques, and the minarets are illuminated. The largeſt ſquare in the city, nearly half a league in circumference, forms an immenſe baſon, ſurrounded by the palaces of the beys, lighted with lamps of various colours. Several thouſand boats with maſts, from which lamps are ſuſpended, produce a moving illumination, the aſpects of which are continually varying. The coolneſs of the night, the ſerenity of the ſky, and various other circumſtances, concur to render the ſcene intereſting and delightful. The Egyptians, according to Maximus Tyrius, worſhipped the Nile on account of its uſefulneſs.

NILEMBI NEUR, a town of the iſland of Ceylon, in the dominions of Candy, about ſix or ſeven miles S. of Candy; whither

whither the king occaſionally retreats, and where he has a palace and ſtore-houſes.

NILIACUM MEL, a name by which the ancients expreſſed the very fineſt honey.

NILOMETER, or NILOSCOPE, an inſtrument uſed among the ancients to meaſure the height of the water of the river Nile, in its overflowings.

Ths word comes from Νειλος, *Nile* (and that from νεα ιλυς, *new mud*, or, as ſome others will have it, from νεω, *I flow*, and ιλυς, *mud*), and μετρον, *meaſure*. The Greeks more ordinarily call it Νειλοσκοπιον. It is called by the Arabians *Mekias*, denoting meaſure.

The nilometer is ſaid by ſeveral Arabian writers to have been firſt ſet up, for this purpoſe, by Joſeph, during his regency in Egypt: the meaſure of it was ſixteen cubits, this being the height of the increaſe of the Nile, which was neceſſary to the fruitfulneſs of Egypt.

From the meaſure of this column, Dr. Cumberland deduces an argument, in order to prove that the Jewiſh and Egyptian cubit were of the ſame length. Scripture Weights and Meaſures, p. 18.

In the time of Herodotus 16, or at leaſt 15 cubits were neceſſary to overflow the *Delta* (which ſee): the ſame number of cubits was the ſtandard meaſure in the time of the Romans. Before the time of Petronius, as we learn from Strabo, plenty was not known in the Delta unleſs the Nile roſe to 14 cubits. A book in Arabic ſtill exiſts, entitled "Nil ſi alnel al Nil," which contains a table of all the riſings of the Nile from the firſt year of the Hegira (A. D. 622), down to the year 875 (A. D. 1470); and this work aſcertains that in the lateſt times, as often as the Nile has 14 cubits depth in its channel, there is a harveſt ſufficient for the year; that, if it reaches 16, there is ſufficient for two years; but when it falls ſhort of 14, or exceeds 18, famine enſues, and this account correſponds exactly with that of Herodotus. The contents of this Arabic book may be known by thoſe who conſult the word *Nile* in the Bibliotheque Orientale of D'Herbelot, or the extracts from Kalkaſendas, in Dr. Shaw's Travels. M. Volney obſerves, that the meaſure of theſe cubits, is not uncertain. Fréret, D'Anville, and M. Bailli, have proved, that the Egyptian cubit, being invariably 24 digits, is equal to 20½ French inches, and the preſent cubit, called "Draa Mafri," is preciſely divided into 24 digits, and contains 20½ French inches. But the columns by which the riſe of the Nile is meaſured have undergone an alteration. Until the time of Omar, the meaſuring column, called the nilometer, had been divided into cubits of 24 digits each; but in order to remedy certain irregularities, which had been found very diſadvantageous to commerce, he ordered this nilometer to be deſtroyed, and ſubſtituting another in its place, which he erected in the iſland of Raouda, he commanded that the 12 lower cubits ſhould conſiſt of 28 digits inſtead of 24, while the upper remained the ſame as before: hence, when the riſe of the Nile appeared by the column to be 12 cubits, it was really 14; for theſe 12 cubits being each of them four digits too long, there was an exceſs of 48 digits, or two cubits. Conſequently, when 14 cubits, the meaſure of a ſufficient harveſt, were proclaimed, the inundation was really at the height for plenty, and the multitude, always deceived by words, never ſuſpected the impoſition. But this alteration could not eſcape the Arabian hiſtorians, who tell us, that the columns of the Saide, or Upper Egypt, continued to be divided by 24 digits; that the height of 18 cubits (according to the old reckoning) was always injurious; and that 19 was very rare, and almoſt a prodigy. Nothing, therefore, is leſs certain than the progreſſive changes here alleged; and which are rendered improbable by a known fact, which is, that in the long period of 18 centuries the riſe of the Nile never varied. Whence then is the preſent difference? How can it ſo ſoon have altered from 15 to 22 cubits, ſince the year 1473? This is owing, as Volney apprehends, not to phyſical changes, but to other circumſtances. It is not the Nile, but the column and meaſures which have varied. Of this fact Pocock and Niebuhr have given ſufficient evidence. If we advert to the account of Herodotus, he ſays that according to the report of the Egyptian prieſts the Nile inundated the Delta, in the time of Mœris, if it only roſe to eight cubits. In order to ſolve this difficulty, it ſhould be conſidered, that ſubſequent to this prince, an alteration took place in the meaſure of the country, and one cubit was made into two. It will be proper likewiſe to obſerve, that the degrees of inundation are not the ſame through all Egypt, on the contrary, a gradual diminution takes place as the river approaches the ſea. At Aſſouan or Syene the overflow is more conſiderable by one-ſixth than at Grand Cairo; and when the depth of water, at this latter city, is 27 feet, it is ſcarcely four at Roſetta and Damietta. The reaſon of this is, that beſides the quantity of water abſorbed by the grounds, as it flows, the river, confined in one ſingle bed, and within a narrow valley, riſes higher in the upper country; whereas, when it has paſſed Cairo, being no longer obſtructed by the mountains, and ſeparating into a great number of branches, it neceſſarily loſes in depth what it acquires in ſurface. Volney's Travels, vol. i.

Herodotus mentions a column erected in a point of the iſland of Delta, to ſerve as a Nilometer: and there is ſtill one of the ſame kind in a moſque of the ſame place.

The Nilometer at the point of the iſle of Raouda is thus deſcribed by Savary. It is a lofty pillar of marble in the middle of a baſin, the bottom of which is on a level with the bed of the Nile. It is graduated through its whole length, and divided into cubits and inches. A Corinthian capital, on which reſts a beam, that ſupports a gallery, crowns this column. When the inundation commences, the waters enter the baſon by a conduit; the public cryers then examine the pillar every morning, and publiſh the daily increaſe of the river in all the ſtreets of Cairo. When it reaches 16 cubits, the dyke, which cloſes the canal of the "Prince of the Faithful," is cut with great ceremony; and the Nile flows acroſs the town, amidſt the acclamations of the people, who make the cryers a ſmall acknowledgment. As Egypt owes no tribute to the grand ſeignior when the waters do not riſe to 16 cubits, they often conceal the truth, and do not publiſh their attainment of a certain point, even when they have paſſed it. See NILE.

Before the Arabian conqueſt of Egypt, the Nilometer was placed in the town of "Halouan," five leagues to the ſouthward of Foſtat, oppoſite to the ancient Memphis, which, at the time of this conqueſt, was the reſidence of the governors of Egypt. In the year 92 of the Hegira, this mekias was overturned, and the caliph ordered another to be erected in the iſland between Foſtat and Gizé. One hundred and forty years after, this Nilometer fell, and the emperor Elmetouakkel built another in the ſame place, which was called the "New Mekias." This Nilometer is now exiſting.

As all the riches of Egypt ariſe from the inundations of the Nile, the Egyptians uſed to ſupplicate them at the hands of their Serapis; and committed the moſt execrable crimes, as actions forſooth of religion, to obtain the favour. This occaſioned

occaſioned Conſtantine expreſsly to prohibit theſe ſacrifices, &c. and to order the Nilometer to be removed into the church; whereas, till that time, it had been in the temple of Serapis. Julian the Apoſtate had it replaced in the temple, where it continued till the time of the great Theodoſius. See, on the ſubject of Nilometers, the Acta Eruditorum Lipſ. anno. 1686, p. 147.

NILUFAR, in *Botany*, a name given by the ancient writers to the common water-lily. They diſtinguiſhed this plant by that name, from the Indian nymphæa, whoſe root was of a cold and ſoporific virtue, like that of the mandrake. This they call always *nenufar*.

NILUS, in *Ancient Geography*, an interior country of Arabia, which furniſhed myrrh and incenſe, according to Strabo, l. xvi.

NIMBO-ETCHAUK, in *Geography*, a town of Bengal; 36 miles N.W. of Ramgur.

NIMBURG, or Niemburg, a town of Bohemia, in the circle of Boleſlaw, near the Elbe; 26 miles E.N.E. of Prague. N. lat. 50° 8'. E. long. 15° 6'.

NIMBUS, among the Romans, a ſcarf embroidered with gold, which women wore on their foreheads.

Nimbus was likewiſe uſed for the money thrown among the people on any public occaſion.

Nimbus, in *Antiquity*, a circle obſerved on certain medals, around the heads of ſome emperors; anſwering to the areolæ, or circles of light, drawn around the images of ſaints. See Medal.

The nimbus is ſeen on the medals of Maurice, Phocas, and others even of the upper empire.

NIMEGUEN, or Nimmegen, in *Geography*, a very ancient, rich, ſtrong, and populous city of Holland, on the S. ſide of the Wahab, ſaid to have taken its name from Magus, king of the Gauls. It is the capital of the Lower Guelderland, and was anciently the capital of the whole duchy: it is alſo the chief town of Betuwa, or Batavia, the country of the Batavi. It has thirteen gates, and is defended by an ancient fortreſs, called Vlack-Hof, ſuppoſed to have been built about the time of Julius Cæſar; and ſeveral other fortifications. It was anciently a free city; and after Charlemagne had rebuilt the caſtle in the year 775, he made this the ſecond imperial city of Lower Germany; Aix-la-Chapelle being the firſt, and Thionville the third. It was ſeparated from the empire by William III., king of the Romans, and united to the comté of Holland in 1248, but ſold by him in 1270, together with its territory, to Otho III., comte of Gueldres, whoſe ſucceſſors remained maſters of it till the ſtates of Holland revolted againſt Spain. It was taken by the French in 1672, and after two years' poſſeſſion, abandoned. The churches of Nimeguen are in general handſome ſtructures; and the town-houſe is remarkable for its beauty and magnificence. The town was taken by the French in 1794; 50 miles S.E. of Amſterdam. N. lat. 51° 53'. E. long. 5 47'.

NIMES, or Nems, a town of Bohemia, in the circle of Boleſlaw; 38 miles N. of Prague.

Nimes. See Nismes.

NIMETACUM, in *Ancient Geography*, a town in the Itinerary of Antonine, on the route from Caſtellum to Colonia Agrippina, between Minariacum and Camaracum; 18 miles from the former, and 14 from the latter.

NIMETULAHITES, a kind of religious among the Turks, ſo called from *Nimetulahi*, their inſtitutor.

When a Turk would be admitted into the order, he is to ſhut himſelf up cloſe in a chamber forty days, reſtricted to four ounces of food *per* day. The term expired, the Nimetulahites take him by the hand, and lead him a Mooriſh dance, accompanied with an infinity of ridiculous geſticulations, till the violence of the exerciſe, with his former regimen, throws him down on the ground. This fall is conſtrued an extacy, during which he is ſuppoſed to have a viſion.

The Nimetulahites meet every Monday in the night-time, and ſing hymns to God, &c.

NIMGOUTA, in *Geography*, a town of Chineſe Tartary, in the government of Kirin. N. lat. 44° 23'. E. long. 129° 21'.

NIMIQUIPAR, a town of New Mexico, in the province of Hiaqui; 156 miles E. of Riochico.

NIMPHÆUM, in *Ancient Geography*, *Kerche*, a town of the Tauric Cherſoneſus, having, according to Strabo, a good port. It was ſituated N.W. of Acra, nearly E. of Zephyrium, and S.S.W. of the Boſphorus or Panticapæum.

NIMPTSCH, in *Geography*, a town of Sileſia, in the principality of Brieg, near the Lohe, with a caſtle on an eminence. The Roman Catholics and the Lutherans have each a church; 25 miles S.E. of Brieg. N. lat. 50° 37'. E. long. 16° 45'.

NINAF, a town of Egypt, on the left bank of the Nile; 14 miles N. of Cairo.

NINDIA, a town of Bengal; 18 miles N. of Burdwan.

NINE FEET Harbour, a bay on the W. coaſt of Florida. N. lat. 27°. W. long. 82° 50'.

NINE ISLANDS, a cluſter of ſmall iſlands in the Pacific ocean, ſo called by Capt. Carteret. S. lat. 4° 40'. E. long. 154° 30'.

NINE-MILE-HOUSE, a village of the county of Tipperary, Ireland, well known to thoſe who travel the great ſouthern road, as the ſtage between Kilkenny and Clonmell. It is 71 miles S.W. from Dublin, and 11 miles N.E. from Clonmell.

NINE-PIN-COLLAR, that ſort of horſe-collar which is made ſomewhat in the form of the ninepin. See Collar.

NINETY-SIX, in *Geography*. See Cambridge.

NINGHAN, a town of Bengal; 18 miles N. of Burdwan.

NINGO, or Allampi, a diſtrict or kingdom of Africa, on the Gold Coaſt, with a town of the ſame name; 43 miles W.S.W. from the river Volta. N. lat. 5° 18. W. long. 0 36'.

NING-PO, a city of the firſt claſs, in the province of Tche-kiang, called by the Europeans Liampo, and having an excellent port, on the eaſtern coaſt of China, oppoſite to Japan. This city is ſituated at the confluence of two rivers, called Kin and Yao, which form a channel, reaching to the ſea, and ſufficient for the navigation of veſſels of 300 tons. Theſe rivers water a plain, almoſt environed by mountains, and forming a kind of oval baſin, whoſe diameter from E. to W. acroſs the city may be about 20 miles, and that from N. to S. being much longer. This place, which reſembles a garden, both by its level ſurface and cultivation, is full of trees and houſes, and divided by a great number of canals. Eighteen or twenty leagues from this place is an iſland, called Tcheou-chan, where the Engliſh firſt landed on their arrival in China. The ſilks manufactured at Ningpo are much eſteemed in foreign countries, eſpecially in Japan, where the Chineſe exchange them for copper, gold, and ſilver. This city has four others under its juriſdiction, beſides a great number of fortreſſes. N. lat. 29° 54'. E. long. 120° 14'.

NINGUM, or Mingum, in *Ancient Geography*, a town of Italy, upon the route from Aquilea to Salona, between

Tergeſte and Pucentium ; 28 miles from the firſt and 18 from the ſecond. Anton. Itin.

NING-YUEN, a town of Chineſe Tartary, ſituated on a river of the ſame name, near the gulf of Leao-tong ; 20 miles E.N.E. of Pekin.

NINIANS, St., a conſiderable town, and extenſive pariſh, ſituated on the ſouth bank of the river Forth, in the county of Stirling, Scotland. The ancient name of the pariſh was Eggles ; nor is it exactly known at what time, or from whom it obtained its preſent appellation. The town is two miles from Stirling, and is noted for its manufacture of tartan, alſo for its tanneries ; and though it contains a population of 4000 perſons, is ſtill under the juriſdiction of the county magiſtrates only. Like moſt of the other pariſhes bordering on the Forth, that of St. Ninians is naturally divided into three regions, differing materially from each other in point of ſoil, fertility, and climate. Theſe are the carſe-lands, which approximate neareſt to the river, the middle or dry-lands, and the muir-lands. In the two firſt-mentioned diſtricts the country exhibits an appearance of high cultivation, and derives much pictureſque effect from the windings of the Forth, and the variety of plantations and ſeats with which they abound. To the hiſtorian and the antiquary St. Ninians is a fruitful theme. Having been in very remote times ſituated near the confines of no leſs than four kingdoms, it was, beyond doubt, frequently the ſcene of contention between them, and was ſometimes in the poſſeſſion of one and ſometimes of another, according to the deciſion of fortune. In ſucceeding ages, it became the theatre of ſome of the moſt glorious events in the annals of Scottiſh hiſtory. The celebrated battle of Bannockburn was fought within this pariſh on the 24th of June, 1314, and is ſtill commemorated in the names of many ſpots, as well as by ſeveral monuments erected by the victorious army. The poſition occupied by the troops of Bruce is diſtinctly marked by numerous veſtiges of military art. On Brocks-brae is an immenſe ſtone, called the Bore-ſtone, ſaid to have ſupported the ſtandard of the Scottiſh monarch ; and on Plain-muir, immediately behind the houſe which lately belonged to Bain Whyt, eſq., is a ſmall circular fortification, pointed out as the ſcite of king Edward's tent. The battle of Sauchie-Burn, ſo fatal to the cauſe of James III., was likewiſe decided in this pariſh, not more than a mile from the field of Bannockburn. The houſe called Beaton's-mills, where the wounded monarch ſought refuge after the engagement, and was put to death, is ſtill ſtanding, and may be ranked among the warning monuments of that ambition which ſo frequently endangered, and in the end brought about the total ruin of the royal family of Stuart.

The pariſh of St. Ninians extends, at a medium computation, about ten miles in length, and ſix in breadth ; and abounds with ſtrata of lime-ſtone and coal, though theſe minerals are only wrought in a few particular ſpots. According to the parliamentary returns of 1811, it contains 1371 houſes, and 7636 inhabitants, being an increaſe, ſince 1801, of 11 houſes and 786 perſons. Sinclair's Statiſtical Account of Scotland, vol. xviii. Beauties of Scotland, vol. iii.

NINIVEH, in *Ancient Geography*. See Ninus.

NIN-O, in *Chronology*, is the name of the era moſt commonly uſed among the Japaneſe. It commences with the reign of Sin-ma, the founder of their monarchy, 660 years before the Chriſtian era.

Nino, in *Geography*, a town of Curdiſtan ; 50 miles W. of Erbil.

NINOVE, a town of France, in the department of the Scheldt, and chief place of a canton, in the diſtrict of Audenaerde, ſituated on the Dender, and having one handſome pariſh-church, rebuilt in 1718 ; 18 miles S.E. of Ghent. The place contains 3021, and the canton 16,773 inhabitants, on a territory of 212½ kiliometres, in 15 communes.

NINSEA, a ſmall iſland near the N. coaſt of Sardinia. N. lat. 48° 17'. E. long 9° 29'.

NINSI, in *Botany*, the ſpecific name of a ſpecies of *Sium*, Linn. Sp. Pl. 361, called by the Japaneſe *Niſji*, or *Nindſin*, much celebrated by Kæmpfer, in his Amœn. Exot. 818, for the virtues of its root ; which reſembles that of *Ginſeng* in form, and, as it ſeems, in reputed reſtorative qualities. Kæmpfer ſays it is, next to Tea, the moſt famous plant of the Eaſt. See Sium.

NINTH, in *Muſic*. The ninth, being one of the principal diſcords, muſt be regularly prepared and reſolved ; but though it is only the octave of the ſecond, and itſelf a ſecond to the octave, yet it requires a very different treatment. The ſecond is prepared and reſolved in the baſe ; but the ninth muſt be prepared and reſolved in the treble, and can very ſeldom have admiſſion in fewer than three parts. The ninth is major or minor, according to the key in which it is uſed. The major ninth is prepared in a third, a fifth, and ſometimes a ſixth, but never in the eighth. It is reſolved in a third, a ſixth, or an eighth, from every one of the concords in which it is prepared. In four parts it is accompanied by the $\frac{5}{3}$, and differs only from the common chord by being taken inſtead of the eighth by ſuſpenſion. The minor ninth is prepared in the third only, and reſolved in the eighth if the baſe is continued ; and reſolved in the third, if the baſe falls a third. In four parts the ſixth, and ſometimes the fifth accompany it. Other diſcords may be joined with the ninth, as $\frac{4}{3}$ or $\frac{9}{7}$, and then both the diſcords muſt be prepared and reſolved together. In four parts the $\frac{9}{4}$ muſt be accompanied by the fifth, and the $\frac{9}{7}$ by the third ; but in five parts both by the third and fifth.

NINTIPOLONG, in *Zoology*, the Ceyloneſe name of a ſpecies of ſerpent, called alſo *ſerpens hypnoticus*. It is a very poiſonous ſpecies, and its bite brings a ſleep upon the perſon, which terminates in death. It is of a deep blackiſh-brown, variegated with ſmall ſpecks of white.

NINUS, in *Biography*, the reputed founder of the Aſſyrian monarchy, is repreſented as the ſon of Belus, and the commencement of his reign is ſuppoſed to have been about the year B.C. 2059. Little can be inferred from the facts recorded of this perſon : it is even doubted whether there ever was ſuch a monarch, and other people confound him with the Egyptian Seſoſtris. He is ſaid to have been of a very martial and ambitious diſpoſition, and to have trained up a vaſt number of his ſubjects to the uſe of arms, and having made an alliance with Ariæus, king of the Arabians, he marched into the diſtrict of Babylonia, the capital of that name not having yet been founded, and eaſily ſubdued it. He then invaded Armenia, the king of which, on making his ſubmiſſion, he left upon the throne as his vaſſal. He next overthrew and put to death the king of Media, and placing a confidential governor over that country, he proceeded to the conqueſt of the reſt of Aſia, all of which, except Bactria and India, he reduced under his dominion. Returning to Aſſyria, he founded the mighty city of Nineveh. He again took the field for the purpoſe of conquering Bactria, which had before reſiſted his arms, and the troops which he muſtered on this occaſion are ſtated at nearly two millions. He defeated the king of the country in the field, but made little progreſs in the ſiege of his ſtrong capital. At this juncture, the huſband of the celebrated Semiramis, who was a principal officer in the army of Ninus, impatient of

of the abſence of his ſpouſe, ſent for her to the camp before Bactria. This lady, diſtinguiſhed for her courage, perceiving that the ſiege was feebly conducted, took a body of men with her; and climbing the rock upon which the citadel was ſeated, entered it, and thus gave the Aſſyrians the opportunity of becoming maſters of the town. Ninus, firſt admiring her valour, was afterwards captivated with her beauty, and was not eaſy till he made her the partner of his throne, and he had by her a ſon named Ninyas. He brought back immenſe ſpoils from Bactria, and died after a reign of fifty years, leaving Semiramis regent of his vaſt dominions. Such is the hiſtory, or, perhaps, more properly ſpeaking, the legend of Ninus; it has been admitted by various writers of antiquity, but certainly no great dependence can be placed upon it. Univer. Hiſt. Holberg's Univer. Hiſt.

NINUS, or *Niniveh*, in *Ancient Geography*, a town of Aſia, the capital of Aſſyria, placed by Ptolemy, Ammianus, and Strabo, in the province of Adiabene, and ſo called from the name of its founder, Ninus, according to the teſtimony of profane hiſtorians. The Scripture aſcribes its origin to Aſhur, the ſon of Shem, or, as ſome have interpreted the paſſage, (Gen. x. 11.) to Nimrod, the ſon of Cuſh, and grandſon of Ham. To this purpoſe Bochart gives the following tranſlation of the original Hebrew: "From this place he (*i. e.* Nimrod) went out to go into Aſſyria, where he built Nineveh, Rehoboth, Calah, and Reſen;" *i. e.* when Nimrod had eſtabliſhed the beginning of his empire at Babylon, and in the land of Shinar, he advanced towards Aſſyria, where he built powerful cities, alſo many fortreſſes, to keep the people in ſubjection. On this ſubject, ſee ASHUR and ASSYRIA. Whoever was the founder of Nineveh, it appears to have been one of the moſt ancient, large, powerful, and famous cities of the world; and to have been ſituated on or near the Tigris, to the weſt, as ſome ſay, and according to others, to the eaſt of this river. In the time of the prophet Jonah (ch. iv. 11.), it was reckoned to contain more than 120,000 perſons, who could not diſtinguiſh their right hand from their left, or of young children who had not attained the age of reaſon; whence it has been inferred, that the number of inhabitants at that time amounted to 600,000 perſons. Strabo allows it to have been much larger than Babylon. Diodorus Siculus ſays, (Bibl. lib. ii.) that it was 480 ſtadia in circumference, or forty-ſeven miles, and that it was ſurrounded with lofty walls and towers; the former being 100 feet high, and ſo broad, that three chariots might drive upon them abreaſt; and the latter, of which there were 1500, were each 200 feet high. Nineveh was taken by Arbaces and Beleſis, in the year B. C. 747, under the reign of king Sardanapalus, in the time of Ahaz, king of Judah, or about the time when Rome was founded. It was taken a ſecond time by Aſtyages and Nabopolaſſar, from Chinaladan, king of Aſſyria, B. C. 626; and no more recovered its former ſplendour. It was entirely ruined in the time of Lucianus Samoſatenſis, who lived under the emperor Adrian. Under the Perſians, however, it was rebuilt, but was deſtroyed by the Saracens about the ſeventh century. Modern travellers inform us, that the ruins of ancient Nineveh may ſtill be ſeen on the eaſtern bank of the Tigris, and on the oppoſite ſide the city of Moſul, which many do not diſtinguiſh from Nineveh. See MOSUL.

NINZIN, in the *Materia Medica*, a name uſed by ſome authors for the famous Chineſe root, commonly called *ginſeng*. See NINSI.

NIO, in *Geography*, an iſland of the Grecian Archipelago, anciently known under the name of *Jos*, becauſe it was peopled by Ionians, is lofty, mountainous, and interſected by ſome vallies and ſome plains that are not very extenſive, and is little more than 40 miles in circuit. The baſe is every where ſchiſtoſe or granitical, and its mountains are for the greater part calcareous. Its population includes 3700 perſons of the Greek church. This iſland pays to the captain-pacha nearly 9000 piaſtres, collected by a Greek waiwode, who is appointed by the Porte, and who maintains order and adminiſters juſtice, conjointly with ſix primates, whom the inhabitants elect every year in a general aſſembly. This iſland would have almoſt eſcaped notice, if Homer, paſſing from Samos to Athens, had not anchored in its harbour, and died there a few days after. The inhabitants paid the reſpect to his memory of erecting a monument, no veſtige of which now remains. Moſt of the medals of Nio bear a palm-tree on the reverſe, though this tree is no longer cultivated in the iſland, as the climate is not ſufficiently warm for the purpoſe. The inhabitants are chiefly cultivators, few of them being mariners or merchants; and as they are active and laborious, water the grounds intended to ſupply herbage and fruits, and well manure the ſoil, they render it, though naturally far from being fertile, in a conſiderable degree productive. The women employ themſelves in ſpinning the cotton which they gather, and in knitting ſtockings and caps for ſale. This iſland furniſhes wine, not only to all its inhabitants, but alſo to thoſe veſſels which anchor in the harbour. When the ſeaſon is good, they gather about 50,000 okes of oil, of indifferent quality. The wheat, barley, and legumes are generally ſufficient for the conſumption of nine or ten months. Cotton, to the amount of from eight to ten thouſand okes, and alſo ſtockings and caps, are annually exported for Ancona and Venice; and ſome cotton cloths are manufactured and conſumed in the iſland. A ſmall quantity of wax and honey is exported. The iſland breeds 400 ſmall fized oxen, 6000 goats, and 300 ſheep. Cheeſe is an article of exportation, but of little importance. The harbour is on the S.S.W. ſide of the iſland; and the town, ſeated on an eminence, is half a league from it; it is tolerably well built, and ſeems to occupy the ſcite of the ancient city. Sonnini ſays, that the inhabitants are hoſpitable and affable; whereas Tournefort, in his time, has deſcribed the Niots as thieves and robbers. The feſtival of St. Gregory, celebrated by the Greeks in this iſland, as well as in ſome others of the Archipelago, is conſecrated to cock-roaches, which are here, particularly in ſummer, very diſguſting and troubleſome inſects. They alſo note the feſtival of St. John the Baptiſt; and they abſtain from undertaking any buſineſs of importance on the ſame day of the week throughout the whole year, becauſe ſuperſtition leads them to imagine, that its iſſue would be unproſperous. N. lat. 36° 46′. E. long. 5° 24′. Olivier. Sonnini.

NION, or NYON, a town of Switzerland, in the Pays de Vaud, delightfully ſituated upon the edge of the lake of Geneva. It was formerly called "Colonia Equeſtris Noiodunum;" and in proof of its antiquity, Roman inſcriptions and other ancient remains have been frequently diſcovered in the outſkirts of the town. In this part the lake forms a beautiful curve, happily alluded to by Lucan, where he mentions the army of Julius Cæſar ſtriking their tents, which were poſted on the borders:

"Deſeruere *cavo* tentoria fixa Lemano."

*i. e.* "They ſtrike their tents, and quit the *hollow bend* of Leman's lake."

The modern manufacture of this town is a beautiful porcelain; 10 miles N. of Geneva. N. lat. 46° 24′. E. long. 6° 6′.

NIONS. See NYONS.

NIORT, a town of France, and capital of the department of the Two Sevres, feated on the river Sevre Niortoiſc. It is divided into two parts, each of which comprehends 7514 inhabitants, the canton of one including 12,502, and that of the other 11,714 inhabitants, on a territory of 215 kiliometres, in 13 communes. N. lat. 46° 19'. W. long. 0° 23'.

NIOTA, in *Botany*, a barbarous name adopted by Lamarck and Poiret, from the Hortus Malabaricus. Lamarck Illuſtr. t. 299. Poiret in Lam. Dict. v. 4. 490. (Karin-Njoti; Rheede Hort. Malab. v. 6. 31.)—Claſs and order, *Octandria Monogynia*. Nat. Ord. *Guttiferæ*, ſect. 3. Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in four ſhallow rounded ſegments, permanent. *Cor.* Petals four, equal, oblong, ſpreading, broad at the baſe. *Stam.* Filaments eight, inſerted into the receptacle, awl-ſhaped, equal, rather ſhorter than the corolla; anthers incumbent, arrow-ſhaped. *Piſt.* Germen ſuperior, four-lobed, probably four-celled; ſtyle central, awl-ſhaped, the length of the ſtamens; ſtigma ſimple. *Peric.* Capſule ſolitary, ovate, with a ſhort oblique point, thick and woody, of one cell, apparently not burſting. *Seed* ſolitary, oval, filling the cavity.

Eſſ. Ch. Calyx in four rounded ſegments. Petals four, ſpreading, much longer than the calyx. Germen four-lobed. Stigma ſimple. Capſule ſolitary, ovate, woody, of one cell, filled by the ſolitary ſeed.

1. N. *pendula*. (N. tetrapetala and pentapetala; Poir. as above. Karin-Njoti; Rheede, v. 6 t. 18.)—Gathered by Commerſon in Madagaſcar. Rheede ſays his plant grows in ſandy ground on the coaſt of Malabar, as well as in Ceylon. He deſcribes it as a lofty *tree*, as thick as a man's body, the *wood* white and bitter. So we find it in Commerſon's ſpecimen. The *leaves* in that ſpecimen are alternate, on *ſtalks* nearly an inch long, elliptic-oblong, or ſomewhat obovate, obtuſe, with a very ſlight blunt point, entire, coriaceous, ſmooth, and ſhining, four inches long, and above one broad, furniſhed with one rib, and a multiplicity of finely reticulated veins. *Stipulas* none. *Flower-ſtalks* ſolitary, lateral, but ſcarcely axillary, uſually as long or longer than the leaves, in one inſtance ſhorter, furniſhed with a minute ſcale or *bractea* at the baſe, pendulous, each bearing an *umbel* of ſeveral *flowers*. Partial *ſtalks* above an inch long, angular, ſmooth. *Flowers* about as large as thoſe of an Orange, to which genus the younger Linnæus ſuſpected this plant might belong. The *petals* are elliptic-oblong, obtuſe, folding laterally over each other in the bud, finely downy externally. Rheede ſays they are on one ſide of a yellowiſh-white, on the other (we preſume the inner) nearly blood-coloured. *Stamens* orange, with red *anthers*. He deſcribes the *flowers* as without ſmell, the *leaves* and *ſeed* intenſely bitter. Lamarck's figure is diminiſhed, except the *fruit*, which agrees with Rheede's, and is as big as a moderate walnut. We have no doubt that both theſe authors deſcribe the very ſame ſpecies, though in the *Hortus Malabaricus*, five *petals* are repreſented, with only as many *ſtamens*. It is well known that this work cannot be implicitly truſted in the latter particular, and the deſcription ſays the *petals* are three or four, ſometimes five. The materials on which M. Poiret has founded two diſtinct ſpecies, ſeem to us therefore inſufficient.

A ſpecimen agreeing with that of Commerſon was ſent by Koenig to ſir Joſeph Banks, for the *Samandara* of Hermann, Muſ. Zeyl. 5, and Linn. Fl. Zeyl. 202, a tree which the latter could not refer to any particular genus. He cites as a ſynonym the *Nagam*, Hort. Mal. v. 6. 37. t. 21, which is certainly the HERITIERA, ſee that article, to which all authors have referred the *Samandara*. It ſeems therefore that Koenig has, in this inſtance, been miſtaken. The other ſynonyms of Linnæus, as mentioning the preſence of ſeveral capſules to each flower, indicate the *Heritiera* and not the *Niota*.

We retain with reluctance this barbarous, though not uncouth, name. The genus ſhould be inſerted near to *Allophyllus* in the Linnæan ſyſtem.

NIP, in *Rural Economy*, a provincial term applied to a near ſplit-farthing houſewife.

NIPA, in *Botany*, the Malay name of this plant, being unexceptionable as to ſound, is retained by Thunberg for the genus. Thunb. Act. Holm. 1782. v. 3. 231. Nov. Gen. 90. Schreb. 777. Willd. Sp. Pl. v. 4. 597. Juſſ. 38. Lamarck Illuſtr. t. 897. (Nypa; Rumph. Amboin. v. 1. 69. t. 16.)—Claſs and order, *Monoecia Monadelphia*. Nat. Ord. *Palmæ*, Juſſ.

Gen. Ch. Male flowers lateral, below the female, on the ſame plant. *Cal.* Perianth proper none. Sheaths oblong, concave, pointed, coriaceous; the outer larger; cloſing gradually upon the inner. *Cor.* Petals ſix, linear, equal, ſpreading or reflexed. *Stam.* Filament one, thread-ſhaped, erect, the length of the petals; anthers twelve, terminating the filament, combined, oblong. Female flowers terminal. *Cal.* as in the male. *Cor.* none. *Piſt.* Germen angular, (frequently five-ſided), obliquely truncated, ſmooth; ſtyle none; ſtigma a lateral furrow. *Peric.* Drupas numerous, collected into an angular head about eight inches in diameter; angles acute or obtuſe; attenuated below, blunted above, ſmooth.

Eſſ. Ch. Male, Calyx none. Petals ſix. Filament ſimple. Anthers twelve, combined. Female, Calyx none. Corolla none. Style none. Stigma a lateral furrow. Drupa angular, with a ſingle ſeed.

1. N. *fruticans*. Thunb. Rumph. v. 1. t. 16.—Native of Java, and other of the Eaſt Indian iſlands. *Stem* in the young plant none, but riſing to ſome feet in height, when the palm is grown to maturity. *Leaves* pinnate; leaflets oppoſite, ſtriated, marginated, pointed, ſmooth. *Male* and *Female flowers* on the ſame plant, but diſtinct, on different ſtalks; males ſeveral, lateral, inferior, in ſpikes, placed on dichotomous ſtalks; females terminal, ſeſſile, forming a little globular head.

Thunberg informs us that the Indians uſe the leaves of this palm for covering houſes and making mats. The fruit alſo is eſculent both in a crude ſtate and when preſerved.

NIPAL, in *Geography*. See NEPAUL.

NIPASKEE, a lake of North America. N. lat. 62° 10' W. long. 101°.

NIPEGON, a large river of North America, which, flowing from the north, diſcharges itſelf into lake Superior. It leads to a tribe of the Chippewas, who inhabit near a lake of the ſame name, ſituated about half-way between lake Superior and Albany river. Near it is a ſmall river, which, juſt before it enters the lake, has a perpendicular fall from the top of a mountain of 500 feet.

NIPES, a town on the north-weſt coaſt of Hiſpaniola; 25 miles W. of Petite Goave.

NIPHATIS, in *Ancient Geography*, a mountain of Aſia, in Armenia, which, according to Ptolemy, was a part of mount Taurus, ſouth of mount Abos, and towards the ſource of the Tigris, which traverſed it by a ſubterranean paſſage of about 25 miles.

NIPHON, NIPON, or *Nifon*, in *Geography*, the principal iſland of Japan, which is applied by the inhabitants to the whole of it. It lies north-eaſt of the iſlands of Kiuſiu, termed alſo Saikokf or the weſtern country, and Sikokf.

Its length from S.W. to N.E. is not leſs than 750 Britiſh miles; but it is ſo narrow in proportion, that the medial breadth cannot be aſſumed above 80, though in two projecting parts it may double that number. The five principal cities in this iſland are Meaco or Miaco, Jedo, Oſacca, Sarunga, and Saccai. N. lat. 33° 45′ to 40°. E. long. 130° to 140°. See JAPAN.

NIPISIGHIT BAY, a name given to the ſouthern projection of Chaleur bay; and a river of this name falls into it from the ſouth-weſt, by a broad bay-like mouth.

NIPISSING LAKE, a lake of Upper Canada, north-eaſt of lake Huron, and connected with it by French river.

NIPISSINS, Indians inhabiting near the head-waters of Ottawas river. The number of warriors is 300.

NIPPERS, in the *Manege*, are four teeth in the forepart of a horſe's mouth, two in the upper, and two in the lower jaw. A horſe puts them forth between the ſecond and third year.

NIPPERS is alſo an inſtrument in uſe among ſmiths and farriers, being a kind of pincers, wherewith, in ſhoeing a horſe, they cut the nails before they rivet them. It is alſo uſed in taking off a ſhoe.

NIPPERS, in a ſhip, are pieces of flat braided cordage, uſed to faſten the cable to the voyal, in a ſhip of war, when the former is drawn into the ſhip, by mechanical powers applied to the latter. Theſe nippers are uſually ſix or eight feet in length, according to the ſize of the cable; and five or ſix of them are commonly faſtened about the cable and voyal at once, in order to be heaved in by the capſtern. Thoſe which are fartheſt aft are always taken off, as the cable approaches the main hatchway; and others are at the ſame time faſtened on, in the fore part of the ſhip, to ſupply their place. The perſons, employed to bind the nippers about the cable and voyal, are called *nipper-men:* they are aſſiſted, at this office, by the boys of the ſhip, who always ſupply them with nippers, and receive the ends of thoſe which are faſtened, to walk aft with them, and take them off at the proper place, in order to return them to the nipper-men. Falconer.

NIPPLE, PAPILLA, in *Anatomy*, a prominence ariſing from the middle of the breaſt or mamma. See BREAST.

The nipples of women, in their firſt lying in, are frequently ſo ſmall, and ſunk into their breaſts, that the infant cannot get at them to ſuck its nouriſhment. The readieſt method, in this caſe, is to apply an infant ſomewhat older, and which can draw ſtronger; or, if this does not ſucceed, to let a woman, who has been practiſed in the art, attempt to ſuck.

When theſe do not ſucceed, it is common to have recourſe to a glaſs pipe, and the poorer people in ſome places uſually make a tobacco-pipe ſerve the turn. Others apply a ſmall cucurbite, made of ivory, in the form of a hat, which they ſuck ſtrongly in their mouth. The common ſucking-glaſs is alſo, when properly applied, of very ſignal ſervice. To do this, the ſmall hole at the ſide is to be ſtopped with wax, and the glaſs heated with warm water; or, by holding it before the fire, ſo as to rarefy, and in part expel the air: it is then to be applied to the nipple, which, in this caſe, will not only be pulled out, but will diſcharge a large quantity of milk, ſo as to take down the inflammation and tumour in the breaſt. When the ſucking power of the glaſs is grown weak, the hole at the ſide is to be opened, and the milk poured out: the glaſs is then to be heated again, and the hole being ſtopped again, is to be a ſecond time applied, and ſo on, till the intention is fully anſwered.

NIPPLE-*Wort*, in *Botany*. See LAPSANA.

The common nipple-wort, which is a weed, growing by the ſide of foot-paths and hedges, was formerly eſteemed excellent for curing ulcerated nipples, whence it obtained its name. It is ſaid to be drying, detergent, and digeſtive. The leaves and ſtalks may be boiled and eaten. James.

NIQUI, in *Ichthyology*, the name of a fiſh of the cucullus kind, approaching to the figure of that ſpecies commonly called *draco* and *araneus marinus*, and in Engliſh the *weaver*. It is common about the American ſhores, and is eatable when the liver and gall are taken out, otherwiſe it is ſaid to be poiſonous. See TRACHINUS *Draco*.

NIR, in the *Materia Medica*, a name given by the Arabian phyſicians to the pigment, or colour made from the *iſatis*, or woad.

NIRANEE, in *Geography*, a town of Hindooſtan, in Allahabad; 16 miles W.N.W. of Currah.

NIRIS, a town of Perſia, in the province of Farſiſtan; 75 miles E. of Schiras.

NIRNOVA, a river of Moldavia, which runs into the Pruth.

NIRVA, a town of Japan, in the iſland of Niphon; 80 miles E.N.E. of Meaco.

NIRUA, a town of South America, in the province of Caraccas; 30 miles N.W. of Segovia Nueva.

NISAMPARA, a town of Hindooſtan, in Bahar; 23 miles S.S.W. of Patna.

NISAN, in *Chronology*, a month of the Hebrews, anſwering to our March, and which ſometimes takes from February, or April, according to the courſe of the moon. It was made the firſt month of the ſacred year, at the coming out of Egypt. *This month ſhall be unto you the beginning of months, it ſhall be the firſt month of the year to you.* (Exod. xii. 2) It was the ſeventh month of the civil year. Moſes calls it *Abib*. The name Niſan is only ſince the time of Ezra, and the return from the captivity of Babylon.

NISAO, in *Geography*, a river which riſes in the centre of the iſland of St. Domingo, and falls into the ſea on the ſouth ſide, 7 miles W. of Nigua river.

NISARI, anciently *Niſyros*, an iſland of the Mediterranean, facing cape Crio, from which it is diſtant only three leagues. It ſeems to have been ſeparated from the iſland of Stancho; and of its origin the ancient poets have given the following allegorical account. Neptune, it is ſaid, being in purſuit of a giant, detached a piece of the iſland of Cos, in order to overwhelm him; and this piece, under which the giant was cruſhed, became the iſland of Niſari, on which a temple to Neptune was erected, in order to commemorate its formation. Under this allegory we may diſcover that the effort of Neptune to conquer the reſiſtance of the giant, means no more than the violence of an irruption of the waters, which, burſting through every obſtacle, worked for themſelves a paſſage acroſs the lands of Cos or of Stancho. Niſari is an iſland of ſmall extent, elevated, and ſtony: it preſents warm waters, and other veſtiges of volcances; grind-ſtones are very common, and it produces ſeveral ſorts of commodities in abundance; but it wants a harbour where veſſels can caſt anchor in ſafety. Niſari is diſtant 20 miles from Rhodes. N. lat. 36° 35′. E. long. 27°.

NISDORF, a town of Bohemia, in the circle of Leitmeritz; 10 miles N. of Kamnitz.

NISEMASSE, a cluſter of ſmall iſlands in the Eaſt Indian ſea. N. lat. 8° 15′. E. long. 128° 42′.

NISH, one of the ſmaller weſtern iſlands of Scotland. N. lat. 56° 14′. W. long. 5° 48′.

NISHAMPOUR, a town of Bengal, and chief place of the circar of Pooſtola. N. lat. 25° 5′. E. long. 88° 38′.

NISI, a town of European Turkey, in the Morea. N. lat. 37° 10′. E. long. 22°.

NISIBIN,

NISIBIN, anciently *Niſibis*, a fortreſs of Aſiatic Turkey, in the government of Moſul; 70 miles N.W. of Moſul. N. lat. 37°. E. long. 40° 30′.

NISIBIS, in *Ancient Geography*, a large and populous city of Meſopotamia, about two days' journey from the Tigris, in the midſt of a pleaſant and fertile plain, at the foot of mount Maſius, and on the river Mygdonia. A treble incloſure of brick walls are defended by a deep ditch. In the year of Rome 684, it was ſubject to Tigranes, king of Armenia, from whom it was taken by Lucullus. It was afterwards taken by Trajan, and, after a revolt, retaken by his troops. Since the time of Lucullus, it had been deſervedly eſteemed the bulwark of the eaſt. It ſuſtained three memorable ſieges againſt the power of Sapor, king of Perſia; and the diſappointed monarch, after urging his attacks above 60, 80, and 100 days, was thrice repulſed with loſs and ignominy. But in the year 363 of the Chriſtian era, after the death of Julian, and under the irreſolute emperor Jovian, it ſurrendered to Sapor by treaty. It is now reduced to 150 houſes. The marſhy lands in its vicinity produce rice; and the fertile meadows, as far as Moſul and the Tigris, are covered with the ruins of towns and villages.

NISIDA, in *Geography*, a ſmall iſland, evidently formed by volcanic exploſion, in the ſouth-eaſt corner of the gulf of Puzzuolo, near the main land, fertile, and well cultivated. On the ſouth coaſt is a ſmall harbour, called "Porto Pavone;" and on a neighbouring rock ſtands a Lazaretto, where ſhips bound for Naples are obliged to perform quarantine. This iſland abounds in rabbits and large black ſnakes: its chief produce is oil; 5 miles W.S.W. of Naples.

NISI PRIUS, in *Law*, a judicial writ which lieth in caſes where the jury being impanelled, and returned before the juſtices of the bench, one of the parties requeſts to have ſuch writ, for the eaſe of the county, whereby to will the ſheriff to cauſe the inqueſt to come before the juſtices in the ſame county, at their coming thither.

It is called a writ of *niſi prius:* and its effect is, that the ſheriff is hereby commanded to bring to Weſtminſter the men impanelled, at a certain day, before the juſtices, *niſi prius juſticiarii domini regis ad aſſiſas capiendas venerint;* that is, unleſs the juſtices go, before that day, into ſuch county to take aſſiſes. This they are ſure to do, in the vacations preceding each Eaſter and Michaelmas terms, and there diſpoſe of the cauſe; which ſaves much expence and trouble to the parties, the jury, and the witneſſes. See JURY.

NISI PRIUS and *Aſſiſe, Courts of*, are compoſed of two or more commiſſioners, who are twice in every year ſent by the king's ſpecial commiſſion, all round the kingdom, (except only London and Middleſex, where courts of *niſi prius* are holden in and after every term, before the chief or other judge of the ſeveral ſuperior courts, and except the four northern counties, where the aſſiſes are holden only once a year,) to try, by a jury of the reſpective counties, the truth of ſuch matters of fact as are then under diſpute in the courts of Weſtminſter-hall.

NISI PRIUS, *Juſtices of*. See ASSISES and JUSTICES.

The preſent juſtices of aſſiſe and *niſi prius* are more immediately derived from the ſtatute Weſtm. 2. 13 Edw. I. c. 30, which directs them to be aſſigned out of the king's ſworn juſtices, aſſociating to themſelves one or two diſcreet knights of each county. By ſtatute 27 Edw. I. c. 4, (explained by 12 Edw. II. c. 3.) aſſiſes and inquieſts were allowed to be taken before any one juſtice of the court in which the plea was brought, aſſociating to him one knight or other approved man of the county. And laſtly, by ſtatute 14 Edw. III. c. 16, inqueſts of *niſi prius* may be taken before any juſtice of either bench, (though the plea be not depending in his own court,) or before the chief baron of the exchequer, if he be a man of the law; or otherwiſe before the juſtices of aſſiſe, ſo that one of theſe juſtices be a judge of the king's bench, or common pleas, or the king's ſerjeant ſworn. For their circuits, ſee CIRCUIT.

NISITA, in *Geography*, a town of Naples, in the province of Lavora; ſeven miles W.S.W. of Cuma.

NISMA, a town of Saxony, in the biſhopric of Naumburg; ſix miles E. of Zeitz.

NISMES, or NIMES, a town of France, and capital of the department of the Gard. It is large, and pleaſantly ſituated on the declivity of a hill, covered with vineyards and orchards, not far from a ſmall river called the "Viſtre." Before the revolution, it was the ſeat of a particular government, and contained a ſeminary, a college, an academy of ancient hiſtory and belles lettres, ſeveral hoſpitals, a citadel, and about 32,594 inhabitants, of whom a third was ſuppoſed to be Proteſtants. It is divided into three parts, and is ſaid to contain 39,300 inhabitants; and its three cantons include 14,972, 14,800, and 12,850 inhabitants, on a territory of 227½ kiliometres, in four communes. It has various manufactures, the moſt conſiderable of which are cloth and ſilk: the number of ſtockings annually made in this town has been computed at 20,000 pair. This city was a large and magnificent city, before it was taken by the Goths. Its veſtiges of Roman antiquity are grand and numerous; among which we may reckon an amphitheatre, a temple of Diana, a grand tower ſuppoſed to have been a mauſoleum, a public fountain, and a temple of the Corinthian order, of exquiſite taſte, erected by the inhabitants, in the year of Rome 754, to the memory of Caius and Lucius, the ſons of Agrippa. N. lat. 43° 50′. E. long. 4° 26′.

NISQUEUNIA, or NESTIGIUNA, a ſettlement of America, on the Mohawk river, between Albany and Schenectady. It is the principal ſeat of the ſociety called "Shakers."

NISSA, a town of European Turkey, in Servia, ſituated on a river of the ſame name, which joins the Ibar, 30 miles N.N.W. of the town. It is ſurrounded with walls and ramparts, and contains ſeveral moſques, baths and fountains: the houſes are conſtructed of clay and wood; 245 miles N.W. of Adrianople. N. lat. 43° 31′. E. long. 21° 36′.

NISSA, or NIZZA, a town of Portugal, in Alentejo; 21 miles E. of Abrantes.

NISSER, a lake of Norway, in the province of Chriſtianſand; 35 miles W. of Skeen.

NISSOLIA, in *Botany*, ſo named by Jacquin and Linnæus, in memory of William Niſſolle, M.D. of Montpellier, author of ſeveral botanical eſſays, in the Memoires de l'Acad. des Sciences, and mentioned as an excellent naturaliſt by Tournefort, who dedicated a ſuppoſed genus to him, in the Inſt. Rei Herb. 656, which is undoubtedly a *Lathyrus*, as all following botaniſts have made it. Jacq. Amer. 198. Linn. Gen. 365. Schreb. 483. Willd. Sp. Pl. v. 3. 899. Mart. Mill. Dict. v. 3. Juſſ. 364. Lamarck Illuſtr. t. 600. Gærtn. t. 145. Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, bell-ſhaped, with five teeth; the upper ones moſt deeply divided. *Cor.* papilionaceous. Standard roundiſh, ſlightly emarginate, reflexed, its edges folded back. Wings oblong, obtuſe,

tufe, erect, dilated upwards, fpreading in the fore part. Keel clofed, the fhape of the wings. *Stam.* Filaments ten, united into a cylinder, which is fplit along the upper fide; anthers roundifh. *Pift.* Germen oblong, compreffed; ftyle awl-fhaped, bent upwards at a right angle; ftigma obtufe, fomewhat capitate. *Peric.* Legume oblong, compreffed, of two or three joints, feparating tranfverfely, fpongy within, the uppermoft terminating in a vertical expanded wing. *Seeds* folitary in each joint, kidney-fhaped, feldom more than one perfected in each legume.

Eff. Ch. Calyx with five teeth. Stamens all connected. Legume jointed, fingle-feeded, ending in a dilated wing.

1. N. *arborea.* Upright Niffolia. Linn. Sp. Pl. 992. Jacq. Amer. 199 t. 174. f. 48.—Stem arboreous, erect. Leaves fmooth.—Found by Jacquin, in woods at Carthagena, in South America, flowering in July and Auguft. Linnæus received a fpecimen from Rolander, but fcarcely any other botanift feems to have noticed this plant. It is defcribed as a *tree* of no beauty, twelve feet high, whofe long weak branches require fupport. *Leaves* deciduous, a fpan long, alternate, ftalked, compofed of one or two pair, with an odd one, of elliptic-oblong, pointed, entire *leaflets*, the terminal one rather the largeft, two and a half or three inches in length; all on fhort, partial ftalks, thin, fmooth, with one rib and feveral tranfverfe veins; fhining above; glaucous beneath. *Stipulas* none. *Flowers* in denfe, fhort, axillary or terminal, ftalked clufters, rather fmall, pale, inodorous. Jacquin defcribes them feffile, or fpiked, but his figure indicates their having ftender partial ftalks, as in the Linnæan fpecimen. He delineates the *legume*, which we have not feen, above three inches long, compreffed, with one fertile joint, a *feed* the fize of a French bean, and a falcate veiny wing.

2. N. *ferruginea.* Ruffy Niffolia. Willd. n. 2. (N. Quinata; Aubl. Guian. v. 2. 743. t. 297.)—Stem fhrubby, climbing. Clufters compound. Leaves clothed with ruffy down beneath.—Gathered by Aublet on the banks of the river Sinemari in Guiana, flowering and fruiting in October and November. The *ftems* twine about the talleft trees to their very tops. The *leaflets* are about four pair with an odd one, gradually larger upwards, veiny, clothed with ruffy down at the back. *Clufters* compound, large, terminal, the *ftalks* and *calyx* covered with ruffy down. *Petals* violet-coloured. *Legume* downy, the fize of the laft, but lefs falcate. The natives call this plant *Quinata.* The bark of the trunk exudes a red tranfparent aftringent gum; probably like that of *Pterocarpus Draco.*

3. N. *fruticofa.* Shrubby Niffolia. Linn. Sp. Pl. 992. Jacq. Amer. 198. t. 179. f. 44. Hort. Vind. v. 2. 78. t. 167. Ait. Hort. Kew. ed 1. v. 3. 6.—Stem fhrubby, climbing. Clufters whorled, leafy. Leaves fmooth.—Gathered by Jacquin, in woods and bufhy places at Carthagena, flowering in September. Lord Petre is faid to have cultivated this plant in 1766. Linnæus had it in his ftove, climbing to a great extent, but never flowering. Jacquin obferved the fame at Vienna, but after 15 years it bloffomed. The *leaves* fomewhat refemble the firft fpecies, but are not half fo large. The *flowers* compofe long, pendulous, whorled, partly leafy *clufters*, at the ends of the branches, and are variegated with yellow and crimfon. *Legume* about an inch long, with a rounded, curved, veiny wing.

NISSUWA, or NAZAWA, in *Geography*, a town of Arabia, in the province of Oman; 80 miles S.W. of Maſcat.

NISUS, in *Ornithology*, a name by which many authors call the *accipiter fringillarius*, or fparrow-hawk. See FALCO *Niſus.*

NISUS is alfo a name ufed by fome old naturalifts for the haliaetus, or *aquila marina*, called in Engliſh the *ſea-eagle*, or *oſprey*. See FALCO *Oſſifragus.*

NITCHOU, in *Geography*, a river which rifes in a mountain of Thibet, and runs into the Burrampooter, at Ghergong.

NITCUDY, a river of Hindooftan, which runs into the Manzorah; 35 miles E. of Oudighir.

NITEDULA, in *Zoology*, the garden-mouſe. See MYOXUS *Nitela.*

NITH, in *Geography*, a river of Scotland, which rifes in Ayreſhire, and paſſing through Dumfrieſhire, enters Solway Frith, about 10 miles below Dumfries. The valley through which it flows is called "Nithſdale" or "Nidſdale." This tract of ground is rich in coals, lime-ſtone, and free-ſtone; its ſoil is generally fertile, highly cultivated, and capable of farther improvement. Although it is now parcelled out among farmers, yet from ſome remains of old walls, it ſeems to have been formerly encloſed as parks for deer or cattle for the duke of Queenſbury, whoſe property it is, and whoſe caſtle of Drumlanrig ſtands near. The mouth of the river is in N. lat. 55° 2'. W. long. 3° 32'.

NITHARD, in *Biography*, an hiſtorian of the ninth century, was the ſon of Angilbert, abbot of St. Riquier, and of Bertha, daughter of Charlemagne. He was born before the year 790, and was probably educated at the court of his grandfather. It is thought that he ſerved in the armies of Charlemagne, in the poſt of duke or count of the maritime coaſt. He was much attached to Louis le Debonnaire, and likewiſe to his ſon, Charles the Bald, king of France. By this prince he was deputed in the year 840 to his brother, the emperor Lothaire, in order to accommodate the differences between them: in 842 he was one of the commiſſioners of Charles in regulating the partition territory with Louis of Germany. The want of ſucceſs in endeavouring to preſerve peace between theſe brothers diſguſted him with the court, from which he retired, and is thought to have embraced the monaſtic life in the abbey of St. Riquier, though it has been aſſerted by others that he continued to ſerve in the army, and was only buried in that monaſtery. Nithard is known in the literary world as the author of a valuable work, containing the hiſtory of the diviſions between the ſons of Louis le Debonnaire, in four books, of which the firſt three were written in 842, and the fourth is loſt. It was publiſhed in 1594 by M. Pithou in his "Annalium et Hiſtoriæ Francorum Scriptores, &c." The ſtyle of the work is obſcure and embarraſſed, but the narrative is methodical, and the author was well informed of the facts which he relates. It has ſince been tranſlated by Ducheſne and Bouquet in their Collection of French Hiſtorians. It was tranſlated into French by Couſin in his "Hiſtory of the Weſtern Empire."

NITHERED, in *Agriculture*, a provincial word uſed to ſignify periſhing with cold.

NITIDULA, in *Zoology*, a genus of inſects of the order Coleoptera, of which the generic character is as follows: antennæ clavate, the club ſolid; ſhells margined; head prominent; thorax a little flattened, margined. There are forty-three ſpecies, divided into two ſections, *viz.* thoſe that have a cylindrical lip, and thoſe that have a ſquare lip. In the former diviſion there are thirty-three ſpecies; in the latter only ten. Theſe laſt form the tribe Elophorus of Fabricius. The inſects are chiefly inhabitants of Europe; a few of them of South America, and ſome are common

mon to our own country. Thoſe of ſection B are, for the moſt part, aquatic inſects, found in ſtagnant waters, or under duck-weed. The reſt are to be traced on plants and flowers.

A. *Lip cylindrical.*

Species.

* Bipustulata. This ſpecies is oval and black; the ſhells have a red dot. It inhabits this country, and other parts of Europe. Deſtroys carcaſes, meat, and bacon, on which it feeds.

4-Pustulata. This is brown and oval; the ſhells are marked with two red ſpots. It inhabits Germany, and is larger than the laſt. The ſhells are ſometimes ſpotted on the margin; the legs are rufous.

Obscura. Oval, black, duſky; the legs are pitchy. It inhabits Germany.

Abbreviata. This is oval, black, and rather duſky; the ſhells are ſmooth, obtuſe, abbreviated. It inhabits New Zealand. The body is a little downy; the legs are rufous or black.

Marginata. Oval; ſhells grooved, the edge and ſpots on the diſk ferruginous. It is found in Italy. The body is beneath pitchy, and the thorax black, with a broad ferruginous border.

* Æstiva. Teſtaceous, ſubvillous; thorax tranſverſe, emarginate; eyes black. This is an inhabitant of various parts of Europe.

Obsoleta. Oval, teſtaceous; ſhells ſmooth; thorax emarginate.

* Ferruginea. Oval, ſubvillous, ferruginous; ſhells ſtriate. This is an Engliſh inſect, and found on the lycoperdon.

Imperialis. Oval, black; ſhells with connected white ſpots, forming two ſtreaks; the edge is rufous. It is found in Germany.

Strigata. Oval, brown; edge of the thorax and ſhells, line at the baſe, and ſtreak acroſs the tip of the latter fulvous. Found in Saxony.

10-Guttata. Oval, brown; edge of the thorax and five ſpots on the ſhell pale. It inhabits Germany.

Varia. Oval; thorax and ſhells varied with black and ferruginous. It is found particularly at Keil.

Sordida. Oval, black; thorax and ſhells dull ferruginous. It is found in divers parts of Germany, and reſembles the laſt.

Flexuosa. Oval, black; edge of the thorax and flexuous ſpot on the ſhells yellow. It is found in France.

Bicolor. Ferruginous; ſhells black, with a ferruginous band at the baſe, and dot at the tip. It inhabits Keil.

Colon. Black; ſhells varied with ferruginous; thorax emarginate. It inhabits different parts of Europe.

Limbata. Black; edge of the thorax and border of the ſhells ferruginous. It inhabits Saxony, and is a very ſmall inſect.

Hæmorrhoidalis. Black; ſhells ferruginous at the tip. It inhabits Hamburgh.

* Discoides. Black; diſk of the ſhells ferruginous; thorax margined. It is found in England, and in various parts of Germany.

* Reticularia. Black; ſhells ſmooth; thorax margined.

6-Pustulata. Black; ſhells truncate; three dots on the ſhells, tail and legs rufous. Inhabits Germany on flowers, and is a ſmall inſect.

Litua. Teſtaceous; ſhells with a black arched blotch. It inhabits Saxony, and is ſmall.

Testacea. Thorax teſtaceous, with a black ſpot; ſhells teſtaceous, with a black band in the middle, dotted with teſtaceous. Found in Keil.

Floralis. Black; ſhells teſtaceous, the future black. An inhabitant of different parts of South America.

* Ænea. Braſſy-green; antennæ and legs black. It inhabits England.

Viridescens. Braſſy-green; legs rufous. It inhabits Keil.

Hemiptera. This is ferruginous; the ſhells are abbreviated, teſtaceous, immaculate. Found in ſome of the South American iſlands.

Dimidiata. Black; ſhells abbreviated, brown; legs ferruginous. This is a very minute inſect, and is alſo found in the South American iſlands.

Truncata. Teſtaceous; ſhells truncate, with a common black ſpot at the baſe. It is found in Germany.

* Rufipes. Black, poliſhed; legs pale. This is an Engliſh inſect.

Setacea. Ochraceous, immaculate; eyes black; ſhells very ſmooth.

Pectoralis. Brown; head and legs ferruginous; club of the antennæ yellow.

Pilosa. Black; ſhells villous; antennæ and legs ferruginous. It inhabits Germany.

B. *Lip ſquare.*

Species.

* Aquatica. Brown; thorax rough, and with the ſhells braſſy-brown. This, as well as the next, is found in many parts of Europe, and in this country in ſtagnant waters.

* Nubila. Grey; thorax and ſhells grooved and rugged.

Elongata. Thorax punctured, braſſy; ſhells brown, with longitudinal raiſed lines. Found in the ſtagnant waters of Germany.

Crenata. Brown; thorax rugged; ſhells grooved crenate. This alſo is found in Germany.

Humeralis. Brown; thorax ſmooth; ſhells crenate, ſtriate, with a humeral teſtaceous dot. It inhabits Germany, and is ſmall.

Flavipes. Black; thorax grooved; ſtriate ſhells and legs teſtaceous. It inhabits Sweden, in ſtagnant water.

Pygmæa. Thorax margined, nearly ſmooth, black; ſhells ſtriate, the tip and legs ferruginous.

* Minima. Thorax ſmooth; ſhells ſtriate; body brown, immaculate. This is found in England, and other parts of Europe, and is, as its name denotes, very minute.

Coccinelloides. Black; head, thorax, and ſhells fumate. Found in Europe.

* Fusca. Brown-teſtaceous; ſhells punctured, ſtriate; antennæ and legs teſtaceous. It inhabits this country, and other parts of Europe.

NITIDUM Folium, among *Botaniſts*. See Leaf.

NITRARIA, in *Botany*, ſo named by Schober, a Ruſſian botaniſt, who travelled under the ſanction of government into Siberia, and who firſt diſcovered this plant on the ſqualid nitro-ſaline parts of the deſert extending from the north of the Caſpian ſea to about the 50th degree of latitude. He alſo found it aſſuming rather a different appearance, in the

the ſalt plains of Siberia, between the Irtis and Ob rivers, by the ſalt lakes near the Jeniſea, and in the regions beyond the lake Baikal. Schob. in Nov. Act. Petrop. v. 7. 315. t. 10. Linn. Gen. 239. Schreb. 322. Willd. Sp. Pl. v. 2. 858. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 147. Juſſ. 316. Lamarck Illuſtr. t. 403. Gærtn. t. 58. Claſs and order, *Dodecandria Monogynia*. Nat. Ord. *Ficoideæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, five-cleft, erect, very ſhort, permanent. *Cor.* Petals five, oblong, ſpreading, channelled, arched at the tip with an inflexed point. *Stam.* Filaments fifteen, awl-ſhaped, nearly erect, the length of the corolla; anthers roundiſh. *Piſt.* Germen ſuperior, ovate, terminating in a thickiſh ſtyle longer than the ſtamens; ſtigma ſimple. *Peric.* Drupa of one cell, ovate-oblong, pointed. *Seed.* Nut ſolitary, three-celled, ovate, pointed.

Obſ. Gærtner ſays, that the unripe germen is trilocular, and that the nut is ſcrobicular, of one cell and ſix-valved at the top.

Eſſ. Ch. Corolla of five petals, arched at their tips. Calyx five-cleft. Stamens fifteen. Drupa ſingle-ſeeded.

1. N. *Schoberi*. Linn. Sp. Pl. 638. Pall. Roſſ. v. 1. p. 1. 80. t. 50. f. A. Andr. Repoſ. t. 529.—Leaves entire, obtuſe.—Native of Siberia, in very rich ſalt lands by the lake Korækofſkoi. It flowers at Kew through the greater part of the ſummer. *Root* woody, knobbed or tuberous. *Stems* numerous, woody, ſpreading, proſtrate, branched, from one to two feet in length, (the *branches* elegantly diſpoſed like a winged leaf,) whitiſh-grey, generally ſpinous. *Leaves* four or five together, ſucculent. *Flowers* in a terminal cyme, about ſix together, of a delicate blue and white, with orange-coloured anthers. *Fruit* blue.

The different appearance aſſumed by this ſpecies when growing near the Caſpian ſea is delineated by Pallas in his *Flora Roſſica* v. 1. t. 50. f. B. Willdenow calls it in that ſtate *N. Schoberi β*, and ſays, that it has broader leaves, red berries, a conical nut, and ſpineleſs ſtem. This variety is larger than the Siberian one in all its parts, and may probably be a diſtinct ſpecies. Pallas ſays, that the berries, though ſaltiſh, are inſipid, and yet reckoned a luxury in the Caſpian deſert. Camels are ſaid to feed on the twigs. From the very ſucculent and ſaline properties of its leaves Murray conjectures, that it might be employed with advantage for the extraction of ſoda.

2. N. *tridentata*. Desfont. in Uſt. Annal. v. 16. 101. Willd. n. 2.—Leaves three-toothed at their tips.—Native of moiſt and ſandy ſpots near the ſea in the neighbourhood of Suſa in the kingdom of Tunis, and on the borders of the deſert. All we know of this is from Desfontaines, quoted above; who deſcribes it as having "ſpinous *branches*, fleſhy *leaves*, and a *nut* with only one cell inſtead of three."

NITRATS, in *Chemiſtry*, that genus of ſalts formed by the nitric acid with the different ſaline baſes. The great facility with which the nitric acid is decompoſed by the different inflammable bodies, is the cauſe of the marked character of detonation poſſeſſed by theſe compounds. The heat and light furniſhed during the detonation of the nitrats with inflammable bodies, as in the caſe of gunpowder, has been uſed as a ſucceſsful argument againſt the Lavoiſerian doctrine of combuſtion. If the oxygen be the ſource of the light and heat, and that only when it paſſes from the elaſtic to the ſolid or liquid form, it will be evident, that cold ought to be produced from the detonation of the nitrats. It is now, however, pretty generally admitted, that bodies do not give out caloric in the ratio of their condenſation, but in proportion to the change of ſpecific heat during the chemical change. It is therefore highly probable, that no great quantity of heat is given out during the combination of nitrogen with oxygen to form nitric acid. It muſt alſo be admitted, that the inflammable bodies themſelves give out a quantity of caloric during the detonation with nitre. A ſimilar concluſion muſt be drawn in the action between oxymuriat of potaſh and the inflammable bodies.

The greateſt proportion of the ſoluble nitrats contain 2 atoms of acid to 1 of baſe, ſo that inſtead of conſidering the acid as 19, the weight of 1 atom, hydrogen being 1, it will be generally found 38. Thoſe ſalts, which have been called ſub-nitrats, are generally nitrats, in which the acid is 19. We ſhall now give an account of ſome of the nitrats that have been omitted in their proper places, and refer to others under their reſpective baſes. Of theſe the moſt important is the *nitrat* of POTASH; which ſee.

NITRAT *of Alumine*. This ſalt is prepared by diſſolving alumine in nitric acid, and evaporating the ſolution till the ſalt cryſtalliſes. In this ſalt there is always an exceſs of acid, and it is therefore ſometimes reckoned a ſuper-nitrat. It cryſtalliſes with great difficulty in thin ſoft plates, which have but little brilliancy. It has an acid and alſo an aſtringent taſte. Its ſpecific gravity, according to Haſſenfratz, is 1.645. It is very ſoluble in water, and when the fluid is evaporated, it is converted into a glutinous maſs of the conſiſtence of honey. It often aſſumes on cooling the form of a jelly. When expoſed to the air, it very ſoon attracts moiſture and deliqueſces. When heated, the acid is diſengaged with great facility, and the earth remains behind.

NITRAT *of Ammonia*. This ſalt was formerly diſtinguiſhed by the names of *nitrum ſemivolatile*, and *nitrum flammans*. Berthollet examined it in the courſe of his experiments on the component parts of nitric acid, and ſir Humphrey Davy, in his reſearches, has added conſiderably to our knowledge of its compoſition and decompoſition. It may be prepared by diſſolving carbonat of ammonia in diluted nitric acid, and evaporating the ſolution till the ſalt cryſtalliſes. The appearance of this ſalt varies much according to the temperature at which its ſolution is evaporated. In a heat of from 70° to 100°, and by ſlow cooling, it is obtained in ſix-ſided priſms, terminated by long ſix-ſided pyramids. When the ſolution is evaporated at the temperature, of boiling water, or 212°, the cryſtals are channelled and have a fibrous texture, or they are formed of long elaſtic threads. When dried in a heat of about 300°, it aſſumes the form of a white and very compact maſs. Theſe differences are unqueſtionably owing to different proportions of water of cryſtallization, which the ſalt contains. Nitrat of ammonia has a very acrid, bitter, and diſagreeable taſte. Its ſpecific gravity is, according to Haſſenfratz, in the Annales de Chimie, 1.579. At the temperature of 60° it is ſoluble in two parts of water, and it diſſolves in half its weight of boiling water. When expoſed to the air, nitrat of ammonia ſoon attracts moiſture and deliqueſces. When it is heated in the ſtate of cryſtals, it becomes fluid at a temperature below 300°, and at from 360° to 400° it boils without decompoſition; but when heated to 450°, or higher, it is gradually decompoſed without loſing its water of cryſtallization. When this ſalt is decompoſed in a temperature not exceeding 500°, it is wholly converted into nitrous oxyd and water. From the experiments of ſir H. Davy theſe products are in about the proportion of four parts of gas to three of water. When expoſed to a heat of 600°, and higher, it explodes, and is

totally decompoſed, being converted into nitrous gas, nitrous acid, water and azotic gas. Hence its name among the older chemiſts, *nitrum flammans*. Its conſtituent parts, according to ſir H. Davy, are

| | | | |
|---|---|---|---|
| Acid - | 69.5 | 72.5 | 74.5 |
| Baſe - - | 18.4 | 19.3 | 19.8 |
| Water - | 12.1 | 8.2 | 5.7 |
| | 100 | 100 | 100 |

In the firſt of theſe analyſes the ſalt was priſmatic; in the ſecond it was fibrous; and in the third it was compact. The chief uſe of this ſalt is for yielding NITROUS *Oxyd*; which ſee.

NITRAT *of Barytes* is uſually prepared by diſſolving native carbonat of barytes in nitric acid, or by decompoſing ſulphuret of barytes by means of nitric acid, and evaporating the filtered ſolution till the nitrat cryſtalliſes. Its cryſtals are regular octahedrons, and they often adhere to each other in the form of ſtars. Sometimes it is obtained in ſmall brilliant plates. Its ſpecific gravity is 29.2 nearly. It is very eaſily reduced to powder. Its taſte is hot, acrid, and auſtere. It is ſoluble in 12 parts of water at the temperature of 60°, and in about three or four parts of boiling water. As the ſolution cools, the ſalt may be obtained in cryſtals. It is ſcarcely at all altered by expoſure to the air. When thrown on burning coals it decrepitates, undergoes a kind of fuſion, and then becomes dry. When ſtrongly heated in a crucible, the whole acid is gradually driven off, and the barytes remains pure. It detonates leſs violently with combuſtibles than moſt of the nitrats. The conſtituents are given by Fourcroy and Vauquelin, in the Annales de Chimie, as follows:

| | |
|---|---|
| Acid - - - | 38 |
| Baſe - - - | 50 |
| Water - - - | 12 |
| | 100 |

NITRAT *of Glucine*. See GLYCINE.

NITRAT *of Lime*. See LIME.

NITRAT *of Magneſia*. See MAGNESIA.

NITRAT *of Magneſia* and *Ammonia* was firſt deſcribed by Fourcroy in 1790, and is prepared by mixing together the ſolutions of nitrat of ammonia and nitrat of magneſia, or by decompoſing either of theſe ſalts in part by the baſe of the other. When the two ſalts are mixed together, the nitrat of ammonia and magneſia gradually precipitates in cryſtals. Theſe cryſtals are in the form of fine priſms; they have a bitter acrid ammoniacal taſte; are ſoluble in about 11 parts of water at the heat of 60°, and in leſs as the temperature is higher. When expoſed to the air, they gradually attract moiſture, but more ſlowly than either of their component parts. The phenomena, which this compound exhibits when heated, are ſimilar to thoſe which its component parts exhibit in like circumſtances. According to Fourcroy it is compoſed of

78 parts of nitrat of magneſia,
22 ——————— ammonia.

NITRAT *of Silver*, in the *Materia Medica*. See SILVER.

NITRAT *of Soda*. See SODA.

NITRAT *of Strontian*. See STRONTIAN.

NITRAT *of Yttria*. See YTTRIA.

NITRAT *of Zirconia*. See ZIRCONIA.

NITRAT *of Ammonia*, in *Agriculture*, a neutral ſaline ſubſtance formed by the combination of the nitric acid and ammonia, or volatile alkali. This ſubſtance cannot be obtained in ſufficient proportions for the purpoſes of agriculture, but is uſeful in the analyſis of ſoils.

NITRAT *of Iron*, a ſalt formed by the union of nitric acid with iron, but is a ſalt rarely preſented by nature: its properties or effects, as they may apply to agriculture, are not, lord Dundonald ſays, worthy of much obſervation.

NITRAT *of Lime*, is an earthy ſalt which conſiſts of the nitric acid and lime. It is found in the mother-earth of nitre manufactories, on old walls, and mixed with true native nitre in the kingdom of Naples. The pureſt is obtained by the artificial and direct combination of its conſtituent parts. And it is a ſaline ſubſtance, that is alſo found in the rubbiſh of old buildings, and in thoſe materials from which ſaltpetre is extracted: *viz.* animal and vegetable matters, which, with a due proportion of calcareous earth, have undergone the putrefactive proceſs, together with a ſubſequent, ſufficiently long, expoſure to atmoſpheric air. According to Dr. Home, it is likewiſe contained in what is commonly called hard-water, which, by his experiments, was found to promote the growth of plants in a much higher degree than ſoft-water. It is very ſoluble and deliqueſcent; it is decompoſed by fixed alkalies, and forms therewith nitrat of potaſh or ſaltpetre, and nitrat of ſoda, or cubic nitre.

NITRAT *of Magneſia*, is an earthy ſalt, compoſed of the nitric acid and pure magneſia. It is found native in the mother-earth of nitre manufactories, and on walls. It has been obtained artificially by direct and indirect combination.

Lord Dundonald remarks that no agricultural experiments have yet been made with this compound; it is a very deliqueſcent and ſoluble ſalt; and there is reaſon to expect, that it will produce effects in promoting vegetation, ſimilar to thoſe which may reſult from the application of the nitrat of lime.

It is decompoſed by alkalies and lime, and forms therewith nitrat of potaſh, nitrat of ſoda, and nitrat of lime.

NITRAT *of Potaſh*, a neutral ſalt, formed by the combination of nitric acid and potaſh, or the fixed vegetable alkali. It is found in the fiſſures of the lime-ſtone hills, near Molfetta, in the kingdom of Naples, in various waters, and even in rain: likewiſe in the freſh juices of many plants, ſuch as the heliotrope, pellitory, tobacco, and others. It is produced ſpontaneouſly wherever its alkaline baſis is expoſed to a free current of air, and to the exhalations of putreſcent vegetable and animal matter; as on damp walls, rubbiſh, the ordure of ſtables, dunghills, &c. In Spain, the Eaſt Indies, and near Lima, it is generated upon commons and uncultivated ground; and it is even aſſerted that in the ſouthern regions of Spain, ſaltpetre is found in the duſt of the high roads. Lord Dundonald, in his treatiſe on the Connection of Agriculture with Chemiſtry, ſtates "that it is conſtituted by the putrefaction and complete decompoſition of animal and vegetable ſubſtances, when mixed with calcareous matter and wood aſhes." It is found to promote vegetation, but is too expenſive to be uſed as a manure for land.

NITRAT *of Soda*, a very ſoluble ſubſtance, formed from the combination of the nitric acid and the minerial alkali, or ſoda, which, on account of the figure of its cryſtals, has obtained the name of *cubic*, or more properly, of rhomboidal nitre. Bergmann diſtinguiſhes it by the name of nitrated ſoda, and modern chemiſts by that of nitrat of ſoda. It has not hitherto been found in a native ſtate, but is always produced, either directly or indirectly, by the artificial combination of its conſtituent parts. "Lord Dundonald

nald ſuppoſes it capable of promoting vegetation in an equal degree with the nitrat of potaſh."

NITRE, in *Chemiſtry*, the *Materia Medica*, &c. See *Nitrat of Potaſh*, under POTASH.

NITRE, in *Agriculture*, a term formerly applied to a ſalt extracted in Perſia and the Eaſt Indies, from certain earths that lie on the ſides of hills; and artificially produced, in ſome parts of Europe, from animal and vegetable matters rotted together (with the addition of lime and aſhes), and expoſed for a length of time to the air, without the acceſs of which nitre is never generated.

It was formerly ſuppoſed to have much influence in the buſineſs of vegetation. See NITRAT *of Potaſh*.

NITRE, *Alkaliſed*, is the fixed alkali remaining after the nitrous acid has been deſtroyed by its detonation with any inflammable matter. This alkali is generally called *fixed nitre*.

NITRE, *Ammoniacal*, is a neutral ſalt reſulting from the combination of the nitrous acid, to the point of ſaturation, with volatile alkali. The acid, in the moſt concentrated ſtate in which it is commonly met with, ſaturates about five-ſixths its weight of vegetable fixed alkali.

NITRE, *Antimoniated*. See ANTIMONY.

NITRE, *Calcareous*, is a neutral ſalt, compounded of the nitrous acid combined to ſaturation with a calcareous earth; and generally called *nitre with an earthy baſis*. This ſalt is very deliqueſcent, but incapable of a true cryſtallization. It has a poignant, acrid, and bitter taſte. See NITRUM *Calcareum*.

NITRE, *Clyſſus of*. See CLYSSUS.

NITRE, *Cryſtals of*. See CRYSTAL.

NITRE, *Cubic*, or *Quadrangular*, is a neutral ſalt, formed by the nitrous acid when ſaturated with mineral alkali. This cryſtalliſes not into a priſmatic but a cubical figure, and ſometimes into parallelepipedons, with rhomboidal faces. It is inferior to ordinary nitre, and never uſed.

NITRE. *Decoction of*, is prepared by boiling half an ounce of nitre, and two ounces of fine ſugar, with a ſcruple of cochineal as a colouring material, in $2\frac{1}{2}$ pints of water, till half a pint is waſted, and after ſtanding to ſettle, the clear purpliſh-red liquor is poured off for uſe.

NITRE, *Diaphoretic, of Antimony*. See ANTIMONY.

NITRE, *Fixed by Arſenic*, is the alkali of nitre, the acid of which has been expelled in an open fire by means of arſenic, of which ſome portion is retained by the alkali. This may be employed as a flux, as it greatly aſſiſts vitrification.

NITRE, *Fixed by Coals*. See FIXED *Nitre*.

NITRE, *Fixed by Metals*, is the alkali of nitre ſeparated from its acid, and mixed with the earth of the calcined metals.

NITRE, *Fixed by Tartar*, is the alkali of nitre and that of tartar mixed together by means of detonation. This is called the *white flux*.

NITRE, *Glauber's Spirit of*. See SPIRIT, and NITRIC *Acid*.

NITRES, *Metallic*, a general denomination that comprehends all neutral ſalts compoſed of the nitrous acid united with a metallic ſubſtance; the ſeveral kinds of which may be thus diſtinguiſhed, *viz. nitre of ſilver*, called *lunar cryſtals*, *nitre of lead*, *nitre of mercury*, &c. The acid acts in general powerfully upon all metallic ſubſtances, but with remarkable differences, depending on the peculiar natures of the metals. It diſſolves zinc, iron, copper, biſmuth, lead, mercury, and ſilver, the moſt readily of all the acids; tin it diſſolves imperfectly; regulus of antimony it only corrodes; gold and platina cannot be diſſolved by nitrous acid alone, without the concurrence of marine acid.

NITRE, *Nitred*. See NITRUM *Nitratum*.

NITRE, *Purified*. See NITRUM *Purificatum*.

NITRE, *Spirit of*. See SPIRIT.

NITRE, *Troches of*, are made by grinding one part of the purified ſalt with three parts of fine ſugar, and making up the mixture with mucilage of gum tragacanth.

NITRE, *Vegetating*. See NITRUM *Vegetans*.

NITRE, *Vitriolated*. See NITRUM *Vitriolatum*.

NITRIC ACID, in *Chemiſtry*, ſo called by the French chemiſts in 1787, is a compound of great value in the hands of the analytical chemiſt. Although this acid may be formed ſynthetically, in very ſmall quantity, by paſſing electric ſparks, in quick ſucceſſion, through a mixture of oxygen and nitrogen gaſes, it is, for all uſeful purpoſes, obtained from nitre (nitrat of potaſh). It appears firſt to have been procured from this ſubſtance by Raymond Lully in the 13th century, by diſtilling it from a mixture of nitre and clay. This method is ſtill practiſed in ſome manufactories, but it is more generally procured by decompoſing the nitre by means of ſulphuric acid, a proceſs firſt diſcovered by Glauber.

Into a glaſs retort put two parts of nitre and one of ſulphuric acid, of the ſpecific gravity of 1.85. A capacious quelled receiver is now to be luted to the retort: the heat of a lamp or a ſand-bath muſt then be gently applied. The nitric acid ſoon begins to be evolved, which condenſes in the neck of the retort, and runs into the receiver, of a pale yellow colour. As the heat is increaſed, yellow fumes ariſe, and the vapour becomes more difficultly condenſed. In this ſtage of the proceſs ſome of the acid is decompoſed into nitrous gas and oxygen gas. Theſe elaſtic fluids render the quelled receiver, or a tube of ſafety, highly neceſſary. The laſt portion of acid is not brought off till the heat has been raiſed almoſt to redneſs.

The liquid obtained by this proceſs was called by the old chemiſts ſpirit of nitre, and aquafortis. It is of a deep yellow or orange colour, and conſiſts, if the materials employed be pure, of nitric acid mixed with nitrous gas, to which it owes its yellow colour; as when this gas is expelled by heat the acid becomes colourleſs as water.

In the large way, and for the purpoſes of the arts, this acid is made in extremely thick caſt iron or earthen retorts, to which an earthen head is adapted, and connected with a range of proper condenſers. The ſtrength of the acid is varied by putting more or leſs water in the receivers. The nitric acid, thus made, generally contains ſulphuric acid, and muriatic acid from the impurity of the nitrat employed. If the former, a ſolution of nitrat of barytes will occaſion a white precipitate: if the latter, nitrat of ſilver will render it milky. The ſulphuric acid may be ſeparated by a ſecond diſtillation from very pure nitre, equal in weight to an eighth of that originally employed; or by precipitating with nitrat of barytes, decanting the clear liquid, and diſtilling it. The muriatic acid may be ſeparated by proceeding in the ſame way with nitrat of ſilver, or with litharge, decanting the clear liquor, and re-diſtilling it, leaving an eighth or tenth part in the retort. The acid for the laſt proceſs ſhould be condenſed as much as poſſible, and the re-diſtillation conducted very ſlowly; and if it be ſtopped when half is come over, beautiful cryſtals of muriat of lead will be obtained on cooling the remainder, if litharge be uſed. Other methods are mentioned for the obtaining aquafortis or nitric acid. The following, which differs but little from that of Glauber, is given by ſir Humphrey Davy in his Elements of Chemical Philoſophy. "It is," he ſays, "procured, for the purpoſe of chemiſtry, by the diſtillation of nitre and oil of vitriol:

about two parts of nitre ſhould be uſed to one part of oil of vitriol, and the retort heated in a ſand-bath connected with a receiver kept cool by moiſtened cloths. This acid, thus obtained, is uſually coloured, but becomes pale by expoſure to air. If the nitre be dry, its ſpecific gravity is from 1.52 to 1.55. This ſubſtance acts with great violence on all metals anciently known, excepting gold and platina, and it cauſes volatile oils to inflame. When it is paſſed through a porcelain tube heated to redneſs, oxygen is given off, and nitrous acid gas; and the ſame effect is produced upon the reſidual acid, as if it had been mixed with water; ſo that it is proved to be compoſed of nitrous acid gas, oxygen of water: and *four* in volume of nitrous gas, and two of oxygen gas condenſed in water, I find abſorb one in volume of oxygen to become nitric acid." He further adds, that from his own experiments, compared with thoſe of Kirwan, Wenzel, and Berthollet, he thinks that the ſtrongeſt acids contain from 14 to 15 *per cent.* of water, and, according to the principles of the French nomenclature, they ought to be called nitro-nitric acids. Aquafortis, or hydro-nitric acid, when its ſpecific gravity is below 1.4, ſtrengthens by being boiled: when ſtronger than 1.45, it becomes weaker by boiling.

The nitre of commerce frequently contains ſome muriatic ſalts, which being decompoſed by the ſulphuric, in common with the nitre, the muriatic acid comes over mixed with the nitric. If an exceſs of ſulphuric acid be employed, and the heat be very great, the latter, more or leſs, is frequently diſtilled over, ſo that nitric acid is often contaminated with ſulphuric and muriatic acids. The preſence of the muriatic acid may be beſt avoided by carefully cryſtallizing the nitre to be employed. If at laſt it ſhould ſtill contain a little muriatic acid, it may be ſeparated by nitrat of ſilver. The ſulphuric acid may be ſeparated by re-diſtilling from a litharge, or barytes ſufficient to ſaturate all the ſulphuric acid. After the nitrous gas has been expelled by heat, the acid may be deemed pure. In this ſtate it is perfectly colourleſs, and of a ſtrong acid taſte, which, when diluted with water, is not unpleaſant. It ſhould be kept in a bottle coated on the outſide with black varniſh, or in a dark place. When it is expoſed to the light, oxygen gas is diſengaged, and the nitrous gas which is liberated tinges it of a yellow colour.

When expoſed to the air it appears to exhale white fumes. This is occaſioned by the great attraction of the acid for the moiſture of the atmoſphere.

To all animal ſubſtances it gives a beautiful yellow tinge.

The ſtrongeſt acid yet produced is not of greater ſpecific gravity than 1.62. Mr. Dalton informs us, that when its ſpecific gravity is 1.42, it boils at 248° of Fahrenheit. If it be ſtronger, the acid is diſtilled off; and if weaker, the water, till it comes to the above maximum. It corrodes animal and vegetable ſubſtances very ſpeedily, and the latter in the greateſt degree. The yellow colour it gives to them, excepting ſubſtances containing albumen, is not produced but when the acid is very ſtrong, and aſſiſted by heat. If it be added to the eſſential oils, they ſpeedily inflame, leaving behind a ſpongy coal. When it is poured upon powdered charcoal, very dry, it takes fire. The ſame effects take place with ſulphur and phoſphorus, at a certain temperature.

It is decompoſed by all the metals, excepting gold, platina, and titanium: hence it is an important agent in chemiſtry for oxydating moſt of theſe ſubſtances. Many of the metals, ſuch as zinc, iron, tin, &c. take the whole of the oxygen from it, while nitrogen alone is diſengaged. Others of the metals, ſuch as ſilver, mercury, copper, &c. deprive it of only one atom of oxygen, the nitrous gas being ſet free, producing red fumes with the preſence of oxygen. When it is poured on zinc, tin, or biſmuth, in a ſtate of fuſion, inflammation takes place. The ſame effect takes place in the cold when the metals are in fine powder.

Nitric acid, as has been deſcribed, is not to be regarded as the real acid, but a compound of real acid and water. The determination of real acid, in a given quantity of the liquid, has much engaged the attention of chemiſts. We are indebted to Kirwan, Davy, Berthollet, and Dalton, for reſearches on this ſubject. The experiments of the firſt and laſt of theſe chemiſts appear to come neareſt the truth.

Mr. Kirwan deprived ſome carbonat of ſoda of its water of cryſtallization: 367 grains of a ſolution of this ſalt contained 50.05 grains. This was ſaturated with 147 grains of nitric acid, of the ſpecific gravity of 1.2754, equal, as he had aſcertained, to 67.179 grains, of the ſpecific gravity 1.5543, which he made his ſtandard. The carbonic acid evolved by adding nitric acid was 14 grains. To this ſolution he added 939 grains of water, which reduced it to the ſpecific gravity 1.0401, at the temperature of 58°.5, the whole ſolution weighing 1439 grains. He next prepared a ſolution of nitrat of ſoda, of the ſpecific gravity of 1.0401, and found that the ſalt, in 1439 grains of this ſolution, was $\frac{1}{16.901}$ of the whole; therefore $\frac{1439}{16.901} = 85.142$ grains of nitrat of ſoda. Now, the $50.05 - 14 = 36.05$ gr. is the weight of the alkali. The acid, therefore, will be $85.142 - 36.05 = 49.092$ grains; but the acid of 1.5543 weighed 67.179 grains; conſequently $67.179 - 49.092 = 18.087$ will be the water contained in 67.179 of acid, of 1.5543 ſpecific gravity, which is equal to 26.9 *per cent.* Hence 100 parts of nitric acid of 1.5543, conſiſts of 73.1 of real acid, and 26.9 of water.

Dalton has made a number of ſimilar experiments, which ſtrongly confirm the concluſions of Kirwan, the greateſt difference between them being no more than 1.4 *per cent.* in the quantity of real acid. The following is a table given by Dalton. The column of real acid is taken from Kirwan, with trifling corrections: in which he has alſo given a column for the quantity of real acid by meaſure, and another ſhewing the number of atoms of acid and water.

| Atoms. | | Acid *per cent.* by Meaſure. | Acid *per cent.* by Weight. | Specific Gravity. | Boiling Point. |
|---|---|---|---|---|---|
| Acid. | Water. | | | | |
| 1 + | 0 | 17.5 | 100 | 1.75 | 30° |
| 2 + | 1 | 13.4 | 82.7 | 1.62 | 100 |
| 1 + | 1 | 11.2 | 72.5 | 1.54 | 175 |
| | | 10.2 | 68.5 | 1.50 | 210 |
| | | 84.7 | 58.4 | 1.45 | 240 |
| 1 + | 2 | 77.2 | 54.4 | 1.42 | 248 |
| | | 71.7 | 51.2 | 1.40 | 247 |
| 1 + | 3 | 59.8 | 44.3 | 1.35 | 242 |
| 1 + | 4 | 48.6 | 37.4 | 1.30 | 236 |
| 1 + | 5 | 40.7 | 32.3 | 1.26 | 232 |
| 1 + | 6 | 34.8 | 28.5 | 1.22 | 229 |
| 1 + | 7 | 30.5 | 25.4 | 1.20 | 226 |
| 1 + | 8 | 27.1 | 23 | 1.18 | 223 |
| 1 + | 9 | 24.6 | 21 | 1.17 | 221 |
| 1 + | 10 | 22.4 | 19.3 | 1.16 | 220 |
| 1 + | 11 | 20.5 | 17.8 | 1.15 | 219 |
| 1 + | 12 | 18.9 | 16.6 | 1.14 | 219 |

The

The firſt column of this table ſhews the number of atoms of acid and water, in which it appears, that when the compound is 1 atom of acid to 1 of water, the liquid acid contains 72.5 of real acid, and 27.5 of water by weight, and the ſame by meaſure will be 112 acid: this laſt is governed by the ſpecific gravity, which is 1.54. The boiling point of this ſtrength being at 175°, it will be ſeen that the maximum of the boiling point is at 248°; when the liquid acid conſiſts of 1 atom of real acid to 2 of water, the ſpecific gravity being 1.42, and the real acid 54.4 *per cent.* The acid, free from water, if its exiſtence in the liquid form be poſſible, Mr. Dalton ſuppoſes would be as volatile as æther. It appears that the acid of 1.42 is the beſt ſtrength to remain permanent, ſince, according to the experiments of this ingenious chemiſt, the acid and water are ſo nearly balanced in their affinities as to evaporate together. The acid or the water will therefore be apt to evaporate, as the real acid or water may be in exceſs above this point, which may be denominated the point of mutual ſaturation.

The acid of this ſtrength has very curious properties, on which Dalton makes ſome ingenious obſervations. Prouſt has ſtated, that an acid of the ſtrength of 1.48 gives no more effervеſcence with tin than it does with ſand. When metals, which produce ammonia, are acted upon by nitric acid; theſe, I ſuppoſe, are ſuch as decompoſe both the water and acid, taking all the oxygen from both. The metal, under this circumſtance, combines with 3 atoms of oxygen, while the nitrogen and the hydrogen form ammonia. If the acid conſiſted of 1 of real acid to 2 of water, an atom of water would be ſet free, which would dilute the remaining acid, and thus facilitate the proceſs. If, however, the acid and water were as 2 to 3, then an atom of nitric acid, and an atom of water, would be afforded to the atom of ammonia, forming an atom of nitrat of ammonia. The remaining acid and water would juſt be reduced to 1 of acid to 2 of water. At this point, and below it, effervеſcence would take place; but in the inſtance with 2 of acid to 3 of water, all the products will be diſpoſed of in forming nitrat of ammonia, and reducing the acid to the ſtrength of 1 of acid to 2 of water, during which change no effervеſcence will take place. This view of the ſubject is very ingenious, and fully explains the phenomena attendant on the oxydation of thoſe metals which cauſe the formation of ammonia.

The acid of 1 of acid to 3 of water, has no ſtriking properties. That which conſiſts of 1 to 4, Mr. Dalton is of opinion, is that which freezes at — 2° of Fahrenheit. Mr. Dalton, and previous to him, ſir Humphrey Davy, have attempted to procure nitric acid in the gaſeous form, by combining nitric oxyd (nitrous gas) with oxygen, but their reſults have not been attended with ſucceſs. This appears to ariſe from the uncertainty in the combination of nitric oxyd gas with oxygen gas, eſpecially when water is not preſent. It appears, from the experiments of Mr. Dalton, that nitric oxyd will combine with oxygen in any proportions between 1.3 and 3.6 of the oxyd to 1 of oxygen. This apparent anomaly to the doctrine of definite proportion is very ingeniouſly explained by the above-mentioned chemiſt. When the nitric oxyd is to oxygen as 3.6 to 1, the oxygen combines with one-half of the nitric oxyd, forming nitric acid, which combines afterwards with the other half to form nitrous acid, or the fuming and coloured nitric acid. When, on the other hand, 1 of oxygen combines with 1.3 of nitrous oxyd, in which the minimum of the latter exiſts, a compound is formed, which, according to the opinion of Mr. Dalton, conſiſts of 1 atom of nitrogen with 3 of oxygen, and which he has denominated the oxynitric acid. The firſt of theſe combinations is favoured by uſing a veſſel which gives a ſhort column of great diameter, and in which the change is quick. The ſecond combination, in which the oxygen is in exceſs, is facilitated by the change being ſlow, which is effected by uſing a long tube of ſmall diameter. A tube of an intermediate ſize being employed when the gaſes are 1 of oxygen to 1.8 of nitric oxyd by meaſure, the nitric acid will be formed by the union of the two gaſes. It is the opinion of this diſtinguiſhed chemiſt, that if the gaſes, even in exact proportions to form nitric acid, be mixed in a dry veſſel, that all the compounds, namely, nitrous acid, nitric acid, and oxynitric acid, may exiſt, which, when water is introduced, may ſo act upon each other, as to form nitric acid. Theſe facts, with the reaſoning reſulting from the ſame, ſeem to baffle all attempts to obtain nitric acid in a free ſtate. Mr. Dalton, after much care and attention, has given the means to determine the component parts of the nitric acid. If, as he ſeems fully to have eſtabliſhed, the atom of nitrogen be 5, and the acid be conſtituted by 1 atom of nitrogen to 2 of oxygen, the proportions will be 14 of oxygen to 5 of nitrogen, and the weight of the atom of acid will be 19. For the colouring of fuming nitric acid, ſee NITROUS *Acid;* ſee alſo NITRIC *Oxyd*, and NITROUS *Oxyd*. The combinations of nitric acid with the different ſaline baſes, are called *nitrats*.

NITRIC, and NITROUS *Acid*, in the *Materia Medica*. The *nitric* acid of the London Pharmacopeia is prepared by mixing *nitrat* of potaſh dried and ſulphuric acid, of each two pounds, in a glaſs retort; and diſtilling the nitric acid from a ſand-bath, until red vapours are produced; then add an ounce of dried nitrat of potaſh, and re-diſtil the acid in a ſimilar manner. The ſpecific gravity of this acid is to that of diſtilled water as 1.500 to 1.000. If a piece of lime-ſtone be immerſed in a fluid-ounce of it diluted with water, ſeven drams ought to be diſſolved. According to the directions of the Edinburgh Pharmacopeia, any quantity of nitrous acid is put into a retort, and having fitted a receiver, a very gentle heat is applied until the reddeſt part ſhall have paſſed over, and the acid which remains in the retort have become nitric acid. The *nitrous* acid of the Edinburgh Pharmacopeia is prepared by pouring ſixteen ounces of ſulphuric acid upon two pounds of bruiſed nitrat of potaſh in a glaſs retort, and diſtilling from a ſand-bath, with a gradually augmented heat, until the iron pot becomes obſcurely red-hot. The ſpecific gravity of this acid is to that of diſtilled water as 1.550 to 1.000. The Dublin Pharmacopeia orders ſix pounds of nitrat of kali to be mixed with four pounds by weight of ſulphuric acid, and then diſtilled until the reſidue becomes dry. The ſpecific gravity of this acid is to that of diſtilled water as 1.500 to 1.000.

In performing theſe operations, it is adviſable to uſe Woulfe's apparatus, or a range of two or three globular receivers, the laſt of which ſhould contain a ſmall portion of water. In order to prevent the nitrous oxyd from combining with the condenſed acid in the receiver, deepening its colour, and giving it that form which conſtitutes nitrous acid, the London College orders a large portion of ſulphuric acid to be employed, which ſerves to contribute a ſufficient portion of water for preſerving the conſtitution of the nitric acid; for, although a large proportion of this acid be obtained by following the directions of the London formula, yet it is actually weaker than that which is obtained either by the Edinburgh or the Dublin proceſſes. The Edinburgh College orders the acid to be kept in this form; and as a medical agent it anſwers the ſame purpoſes as the colourleſs acid; for, when both are diluted with water, they have the

the ſame appearance, and are brought to the ſame ſtate, the addition of the water expelling completely the nitrous oxyd, which is looſely united with the nitric acid to form the nitrous. The quantity of acid obtained is about half the weight of the nitrat employed: and the reſidue is a white, ſpongy, ſaline cake of ſulphat of potaſh, with an exceſs of ſulphuric acid, which may be diſſolved out of the retort by hot water. By the London proceſs, the nitric acid is at firſt obtained tolerably free from nitrous oxyd; but in general the re-diſtillation will be found neceſſary. In the expulſion of the nitric oxyd, to change the nitrous into nitric acid, according to the directions of the Edinburgh College, a portion of the acid is carried over with the gas, as nitrous acid vapour: this ſhould not be waſted, but be condenſed by a ſmall portion of water being put into the receiver, and thus form a diluted acid. Mr. Murray (Mat. Med.) juſtly obſerves, that the heat of a water-bath is beſt adapted for this operation, being ſufficient for the purpoſe, and not too high to produce the decompoſition of the acid. A completely colourleſs acid, however, is not obtained, unleſs the acid be re-diſtilled from a ſmall portion of black oxyd of manganeſe; but this is not neceſſary for medical purpoſes. The contaminations of nitric acid by muriatic or ſulphuric acid do not affect its medicinal virtues.

*Nitrous* acid, as the term is underſtood in the Edinburgh Pharmacopeia, is a yellow or orange-coloured fluid, emitting, when expoſed to the air, deep orange-coloured extremely ſuffocating fumes. With regard to its chemical affinities and other qualities, it agrees in every reſpect with nitric acid. It conſiſts of nitric oxyd looſely combined with nitric acid and water.

*Nitric* acid is a colourleſs, or very pale yellow, limpid fluid, emitting, when expoſed to the air, white ſuffocating vapours, and poſſeſſing ſtrong acid properties. It is highly corroſive, and tinges the ſkin yellow, which remains till the epidermis is peeled off. It unites with water in every proportion, and while mixing heat is evolved. See the articles NITRIC and NITROUS *Acid*, ſupra.

Strong fluid nitric acid is uſed only for pharmaceutical purpoſes; except when extricated in the form of vapour, it is employed for deſtroying contagion. It is leſs powerful than the oxymuriatic acid, but is more generally uſeful, as it can be extricated in the chambers of the ſick without proving deleterious to animal life. For this purpoſe, f℥ij of ſulphuric acid may be poured over ℥iv of coarſely powdered nitre in a china cup, and placed in a pipkin of hot ſand. This quantity is ſufficient for fumigating a room that is ten feet ſquare; and where a larger portion is required, it is more adviſable to multiply the number of pipkins than to put a larger quantity of the materials into one veſſel. The officinal preparations of nitric acid are the following, *viz.* Acidum nitricum dilutum, L.E.D.; Oxydum antimonii, L.; Argenti nitras, L. D.; Liquor ferri alkalini, L.; Ung. hydrargyri nitratis, L. E. D.; Hydrargyri nitricum oxydum, L.; Spiritus ætheris nitrici, L. E. D.; Unguentum acidi nitroſi, E. D.

The diluted nitric acid, L., is prepared by mixing a fluid-ounce of nitric acid with nine fluid-ounces of diſtilled water. For that of E. take equal weights of nitrous acid and mix them, avoiding the noxious vapours. For that of D. take of nitrous acid and diſtilled water of each one pound. The ſpecific gravity of this mixture is to that of diſtilled water as 1280 to 1000. When the diluted acid is prepared according to the directions of the London College, f℥i contains about grs. x of nitric acid, of 1.500 ſpecific gravity, while the ſame meaſure of the ſame acid, prepared after the Edinburgh and Dublin, and the former London formulæ, contains grs. xxxv of the ſame acid; a difference, which, as it may lead to errors in practice, is to be regretted.

Nitric acid is tonic and antiſeptic. When largely diluted with water, it forms an agreeable and uſeful beverage in fevers, particularly of the typhoid type. In larger doſes, leſs diluted, it has been adminiſtered with effect in chronic hepatitis, even when dropſy has ſupervened; and it has alſo been ſerviceable in reſtraining violent ſickneſs, in dyſpepſia, aſthma, and the greater number of cachexiæ. From obſervations of Mr. Scott, publiſhed at Bombay in 1796, this acid excited attention as a remedy for ſyphilis; but after the moſt ample trials, by almoſt every practitioner of eminence in the country, its antiſyphilitic powers have not been found to correſpond to the accounts of thoſe tranſmitted from India. Although it gives a temporary check to the progreſs of the diſeaſe, it does not permanently remove the ſymptoms; and, as Mr. Pearſon juſtly obſerves, it would by no means be warrantable to ſubſtitute the nitrous (or nitric) acid in the place of mercury, for the cure of venereal complaints. It has been found, however, of conſiderable ſervice when given at the ſame time with mercury, in old obſtinate ulcerations of the legs, although no venereal taint could be ſuſpected; and it is employed with benefit as a local ſtimulant in the form of lotion, in the proportion of f℥ij of the acid to oj of water, to fœtid ulcers, attended with a thin ichorous diſcharge, and in caries of the bones. In India it is ſometimes uſed in the form of a bath, and in this ſtate produces the ſame effects as when it is taken internally. The doſe of the diluted acid is from m x to m xxx in f℥iij of water, given three or four times a day. Its officinal preparations are, Aceti hydrargyri, E. D.; Submurias hydrargyri præcipitatus, E. D.; Submurias hydrargyri ammoniatus, D.; Oxydum hydrargyri cinereum, E. D.; Oxydum hydrargyri rubrum, E. D. See MERCURY. Thomſon's Lond. Diſpenſatory, 1811.

NITRIC *Oxyd*, in *Chemiſtry*. This ſubſtance, like the nitric acid, is a compound of nitrogen with oxygen: the former being formed of 1 atom of nitrogen to 2 of oxygen, the latter 1 to 1.

Several of the metals, as ſilver, mercury, and copper, when added to the nitric acid, deprive it of 1 atom of oxygen only. The remainder, which is 1 to 1, eſcapes in the form of gas. This gas has been formerly called nitrous gas; but, according to the preſent ſtate of chemical nomenclature, it is called nitric oxyd.

To procure nitric oxyd, introduce ſmall bits of copper into a gas bottle, or a ſmall retort, upon which pour nitric acid of the ſpecific gravity 1.2. Let the proceſs go on a little, the mouth of the retort being under water, or mercury, before the gas is collected. This ſerves to diſplace the air of the retort. The gas, which is now obtained, will be colourleſs as common air. In this proceſs, an atom of copper decompoſes two atoms of nitric acid, taking an atom from each to form the ſecond oxyd of copper. This oxyd then combines with two other atoms of acid, to form nitrat of copper. The two atoms of nitric oxyd, reſulting from the decompoſed acid, would be abſorbed by the remaining acid, if a ſufficient quantity were preſent; by which it would acquire, firſt, a yellow colour; a deep orange, as it increaſes; next, a green; and ultimately, a blueiſh tint. For the better obſervance of theſe ſhades of colour, ſilver ſhould be employed inſtead of copper; ſince the ſolutions of copper in any acid are of green colour. When, however, the exceſs of acid is not great in producing nitric oxyd, a great proportion of this gas is evolved. For common purpoſes,

poſes, it may be collected over water, which abſorbs only about $\frac{1}{20}$th of its bulk: on ſome occaſions, however, it is neceſſary to collect it over mercury.

Nitric oxyd may be ſeparated from other gaſes, by means of ſolutions of iron with the black oxyd. The liquid, by agitation, ſoon abſorbs all the nitric oxyd, without affecting any other gas that might exiſt with it. This furniſhes an eaſy method of aſcertaining the purity of nitric oxyd. The abſorbed gas may be ſeparated unchanged by heat.

When the nitric oxyd is mixed with oxygen, or is brought in contact with the atmoſphere, red fumes immediately appear, which are of greater denſity than common air. This is called nitrous acid gas.

The ſpecific gravity of nitric oxyd is to common air, according to Kirwan, as 1 to 1.19; but Davy, who is nearer the truth, makes it 1.102. If hydrogen be equal to 1, and 100 cubic inches weigh 2.5 grains, then the nitric oxyd will be 13, and 100 cubic inches of it will weigh 32.5 grains.

When a lighted taper, or ſulphur in a ſtate of inflammation, are immerſed in this gas, the flame becomes extinguiſhed; but phoſphorus and charcoal, when once kindled, burn in it, and conſequently deprive it of its oxygen.

Several of the metals, ſuch as arſenic and zinc, when heated in this gas, deprive it of its oxygen; the reſidual gas being nitrogen.

Other bodies take away only part of its oxygen: of theſe are the alkaline ſulphurets, the muriatic ſolution of tin, and ſeveral of the ſulphats. For theſe facts we are indebted to ſir Humphrey Davy. The reſulting gas is the nitrous oxyd, which is compoſed, according to Dalton, of one atom of oxygen to two of nitrogen. In this proceſs, an atom of nitric oxyd gas gives up an atom of oxygen, which combines with the decompoſing body; while the deſerted atom of nitrogen combines with an atom of nitrous gas, forming nitrous oxyd. This moſt clearly ſhews why the atom of nitrous oxyd ſhould be heavier than an atom of nitric oxyd. The latter atom is conſtituted by 1 to $1 = 5 + 7 = 12$; the former of 1 of oxygen to 2 of nitrogen, or $7 + 2 \times 5 = 17$. Sir Humphrey Davy, notwithſtanding this corroborating fact, conſiders nitrous oxyd as 1 of oxygen to 1 of nitrogen; by doing which, the nitric acid is made to conſiſt of 1 of nitrogen to 5 of oxygen; a thing very improbable between two bodies having ſo little affinity for each other.

When nitric oxyd is acted upon by electricity, an atom of oxygen is liberated from one atom of the gas, and given to another, till the whole is divided into nitric acid and nitrogen. In other words, one-half of the gas gives its oxygen to the other half. By this change, if the original volume be 1, the reſulting volume will be $\frac{1}{2} \times \frac{13}{12.125} = \frac{13}{24\frac{1}{4}}$, a little more than half.

When nitric oxyd is mixed with hydrogen, it does not explode by the electric ſpark. It is, however, ſaid to detonate, when paſſed through a red-hot porcelain tube; the reſult being water and nitrogen. The relative volume of theſe gaſes, to produce this reſult, will be 13 of hydrogen and 12 of nitrogen.

We are indebted to Dr. Henry for the fact of nitric oxyd being decompoſed by ammonia. For this purpoſe, the two gaſes are to be put into the ſtrong tube, called Volta's eudiometer, and the electric ſpark paſſed through them. When the nitric oxyd is in exceſs, the reſult is nitrogen, water, and a little nitric acid; when the ammonia predominates, then nitrogen, water, and hydrogen are produced.

From the great facility with which the nitric oxyd combines with oxygen, it has been employed to aſcertain the quantity of oxygen mixed with other gaſes. There is, however, ſome uncertainty in this method, in conſequence of ſeveral compounds being formed by oxygen and nitric oxyd. Dalton recommends an exceſs of the latter to be uſed, in order to prevent the ambiguity above mentioned, and afterwards to take up the exceſs with a ſolution of the green ſulphat of iron.

When nitric oxyd is mixed with oxymuriatic acid gas, a ſudden decreaſe of volume takes place, from the muriatic acid and nitric acid being formed, both of which become liquid. This effect, however, does not take place, if the gaſes be perfectly dry, and the veſſels free from moiſture.

Since an atom of nitric oxyd conſiſts of 1 of nitrogen to 1 of oxygen, the weight of its atom will be $5 + 7 = 12$; the nitric acid, being 1 of nitrogen to 2 of oxygen, will be $5 + 2 \times 7 = 17$: hence the proportions of oxygen and nitric oxyd to form nitric acid will be 7 to 12. In mixing this with other gaſes, where mutual action takes place, the proportion by weight will be as the weights of their atoms. Their proportions by volume will be obtained, by multiplying the ratio of their weights by the united ratio of their ſpecific gravities: the latter ratio will be eaſily expreſſed, by making the ſpecific gravity of hydrogen gas unity. If, for inſtance, nitric oxyd be mixed with hydrogen, to be paſſed through a red-hot porcelain tube, the proportion by weight will be 12 of the oxyd to 1 of hydrogen, the relative weights of their atoms, and $\frac{12}{1} \times \frac{1}{13} = \frac{12}{13}$, or 12 of nitric oxyd by meaſure to 13 of hydrogen. Ammonia and nitric oxyd will be $\frac{6}{12} \times \frac{13}{7.5} = \frac{13}{15}$, or 13 by volume of ammonia to 15 of nitric acid.

NITRO-AERIAL Spirit, a term invented by Mayow, and ſince uſed by many others, to expreſs a very active principle in the air, cauſing great changes in the bodies abſorbing it, and expoſed to it. This acid ſpirit is, according to Mayow, compoſed of terrene matter, which is flexible and humid, and of etherial particles, which are rigid and dry, active and igneous, and proceeding from the air. Theſe igneous particles are common to nitre and to air, and are therefore called *nitro-aerial;* and the ſpirit of nitre derives, according to this ſyſtem, from theſe particles its active and corroſive quality, which makes it a ſort of potential fire; and on this the form of nitre chiefly, if not wholly, depends.

NITROGEN, in *Chemiſtry*, a ſimple oxydable body, by ſome chemiſts called azot, from its property of deſtroying life. This name appears improper, ſince ſeveral other gaſes have the ſame effect upon animals.

Before the diſcovery of Cavendiſh, our knowledge of this gas was little more than negative. It was then believed to be the baſe of the nitric acid, but the certainty was not eſtabliſhed till the gas was combined with oxygen, by paſſing a number of electric ſparks through the two gaſes. This is the only poſitive knowledge we yet poſſeſs of this ſubſtance. Its ſpecific gravity is $12^{\frac{1}{2}}$, hydrogen being 1. The weight of its atom is 5, hydrogen being 1. See Azot.

NITRO-MURIATIC Acid. This acid is formed by mixing the nitric and muriatic acids together, or by diſſolv-

ing muriat of ammonia in nitric acid. In the latter proceſs part of the nitric acid decompoſes the ſalt, while the other part acts upon the diſengaged muriatic acid, to form the nitro-muriatic acid. This acid was known to the ancients, who called it *aqua regia*, from its property of diſſolving gold. It is now pretty generally admitted to be oxymuriatic acid, formed by the oxygen of the nitric acid with the muriatic acid. Hence we may infer, that the proportions of theſe acids ſhould be as the weight of the atoms of real acid, which is 22 of muriatic acid to 19 of the nitric: the latter gives an atom of oxygen to the former, forming oxymuriatic acid, which will be 29, while 12 of nitric oxyd will be partly evolved, but is more generally retained by the liquid, to which it gives an orange colour.

This is by far the moſt convenient menſtruum for gold and platina, and is uſed in the arts for that purpoſe. See OXYMURIATIC *Acid*.

NITROUS ACID. This name has been commonly given to the nitric acid when rendered fuming by the preſence of nitric oxyd. Since, however, nitric acid may contain almoſt any proportion of nitric oxyd, we cannot with propriety admit this mixture as nitrous acid. Dalton is of opinion that nitric acid and nitric oxyd may unite in ſuch proportions as to form a compound, to which he has given the name of nitrous acid. In order to obtain pure nitrous acid, this chemiſt recommends water to be firſt impregnated with oxygen gas, and then with nitric oxyd. By this means 2 atoms of nitric oxyd unite with 1 of oxygen, forming nitrous acid. Since, as we have obſerved under NITRIC *Oxyd*, that nitric acid is 1 of nitric oxyd to 1 of oxygen, nitrous acid muſt, therefore, conſiſt of 1 atom of nitric acid, united to 1 of nitric oxyd, and its atom will be, therefore, $12 + 19 = 31$.

Mr. Dalton ſuppoſes that the common fuming acid is generally a compound of nitrous acid and nitric acid. He obtained an acid by ſaturating nitric acid of 1.3 with nitric oxyd gas, which boiled at 160°, while the ſame acid, without the gas, boiled at 236°. Hence he concludes that the nitrous acid is formed in the firſt inſtance, and gives the increaſed volatility to the nitric acid.

The exiſtence of an acid, containing leſs oxygen than the nitric acid, has been inferred from the fact of expoſing nitrat of potaſh to a certain degree of heat, by which a portion of oxygen gas is driven off. The ſalt, however, is ſtill neutral, a proof that the remaining acid was ſtill capable of ſaturating the alkali. Hence it has been ſuppoſed, that nitric acid has parted with ſo much of its oxygen as to leave nitrous acid, and that the ſalt is converted from a nitrat into a nitrite. In this experiment an atom of oxygen is diſengaged from an atom of nitric acid, leaving an atom of nitrous oxyd, which combining with another atom of nitric acid, forms an atom of nitrous acid, ſo that the reſult is half as many atoms of the latter, as there were of the nitric acid. The ſalt originally conſiſted of 1 atom of potaſh combined with 2 atoms of nitric acid, while the reſulting ſalt conſiſts of 1 atom of nitrous acid, combined with 1 of alkali.

NITROUS *Gas*. See EUDIOMETRY and GAS.

NITROUS *Oxyd*. In referring to NITRIC *Oxyd*, it will be found that it is compoſed of 1 atom of nitrogen and 1 of oxygen. This is a compound of the ſame elements, but with leſs oxygen. In the ſequel it will appear that nitrous oxyd is formed of 2 atoms of nitrogen with 1 of oxygen, being, therefore, a heavier atom than nitric oxyd as 17 to 12. The following is the proceſs for procuring this gas in a ſtate of purity. Into a glaſs retort put as much cryſtallized nitrat of ammonia as will half fill it when fuſed: place the retort over a lamp, capable of giving a degree of heat equal to 400°, and let the neck of the retort be connected with a pneumatic trough. After the ſalt has fuſed, and the water of cryſtallization driven off, the heat requires to be raiſed to between 3 and 400° of Fahrenheit. Numerous bubbles will ſoon appear on the ſurface of the fluid, much more brilliant than thoſe previouſly obſerved from the boiling of the liquid. It is under this appearance that the ſalt is decompoſed, and the nitrous oxyd evolved. This decompoſition will go on till the retort is quite empty, the whole of the nitrat of ammonia being converted into water and the gas in queſtion. It will be proper to obſerve, that the retort muſt be removed the inſtant the laſt portion of ſalt is decompoſed, to prevent the water of the veſſel coming into it by the preſſure of the atmoſphere. If the gas be received over water, a quantity of gas, equal to the volume of the water, will be abſorbed. Hence, for any nice experiments, it ſhould be received over mercury. Nitrous oxyd has all the mechanical properties of common air, with reſpect to tranſparency, colour, and elaſticity. Its ſpecific gravity is 20, hydrogen being 1, and the weight of 100 cubic inches is equal to 50 grains. Its conſtitution will be eaſily ſeen from its formation, in the proceſs above deſcribed. Nitrat of ammonia is conſtituted by an atom of nitric acid, an atom of ammonia, and 1 of water. When the ſalt is decompoſed, the 2 atoms of nitrogen, 1 from the acid, and the other from the ammonia, jointly combine with 1 atom of oxygen from the acid, forming nitrous oxyd, while the other atom of the oxygen from the acid combines with the hydrogen of the ammonia, forming water. This agrees with the fact, ſince nitrat of ammonia produces nothing but water and nitrous oxyd. Nitrat of ammonia, according to ſir Humphrey Davy's numbers, conſiſts of 1 proportion of acid and 5 proportions of oxygen for the acid, and 1 of nitrogen to 6 of hydrogen for the ammonia. The 2 proportions of nitrogen retain, each, a proportion of oxygen, forming 2 of nitrous oxyd, while the other 3 of oxygen combine with 6 proportions of hydrogen, forming 3 of water. This equally explains the fact, but does not poſſeſs the ſimplicity of Dalton's numbers for the weight of atoms. It is not leſs irreconcilable, that 1 of nitrogen ſhould combine with 6 of hydrogen, than 1 of nitrogen combining with 5 of oxygen to form nitric acid.

Although the nitrous oxyd contains leſs oxygen than nitric oxyd, yet the former ſupports combuſtion with moſt bodies; while the latter, as has been obſerved under that article, is ſcarcely ſuſceptible of this property. If ſulphur be firſt kindled, and then introduced into nitrous oxyd, it burns with a brilliant roſe-coloured flame, producing ſulphuric acid and nitrogen gas.

Phoſphorus, ſimilarly treated, burns with great violence.

Carbon expoſed in this gas, and fired by a lens in the ſun's heat, burns with great brilliancy, producing carbonic acid and nitrogen gas. According to Prieſtley it is capable of detonation with hydrogen, by the electric ſpark producing water and nitrogen. When the hydrogen is not ſufficient, nitric acid is ſaid to be formed. This latter fact appears very improbable.

It is alſo decompoſed by ſulphuretted, phoſphuretted, and carburetted hydrogen gaſes, by applying the mixtures to a ſtrong heat.

Iron wire burns in this gas equally well with oxygen, but with leſs duration, producing the black oxyd of iron. It is decompoſed by zinc, the nitrogen being left, while the zinc is

oxydated. It is ſaid to combine with potaſh and ſoda, forming peculiar compounds.

Dr. Prieſtley, who diſcovered this gas in 1776, declares it unreſpirable, and the Dutch chemiſts, who afterwards examined it, coincide with him in this opinion. We are indebted to ſir Humphrey Davy for many additional facts relative to it, among which he found that, to a certain extent, it is reſpirable, under which it produces effects on the ſyſtem not much unlike intoxication: theſe effects are, however, very different on different ſubjects, and according to the time it is breathed. Some become highly exhilarated, exhibiting unuſual motions and geſtures, with incoherent language, and at the ſame time unconſcious of all around them. On returning conſciouſneſs, they deſcribe ſome extravagant ſcene, which they relate as a dream, but in which the impreſſions have been more vivid. Others are very differently affected, appearing almoſt in a ſtate of inſenſibility. The countenance appears as in a ſtate of paralyſis, and of a livid and purple colour. They will ſit motionleſs for ſome time, and when they recover have no lively dream to repeat. Almoſt all who breathe it effectually, become unconſcious in a few minutes, and breathe the gas involuntarily for ſome time afterwards. During the rage for gaſeous medicine, it was held up as promiſing great advantage in certain diſeaſes. This idea has been ſome time abandoned, with little hope of its revival.

NITRUM is uſed by the poet Martial to expreſs that ſort of foulneſs in cryſtal, which Pliny, and others of the ancient Roman authors, diſtinguiſhed by the name of *ſal*.

Nitrum *Calcareum*, in *Natural Hiſtory*, a name given by Dr. Liſter to a peculiar ſpecies of neutral ſalt, which he firſt publicly deſcribed in his book on the medicinal waters of England. He very improperly calls it nitre; becauſe it has none of the properties or qualities of nitre, but only a ſort of general reſemblance in its external form. He obſerves that this ſalt, though very little known, was abundantly the moſt copious of all the ſorts afforded by the mineral waters in general; and ſays its cryſtals were long and ſlender, and conſiſted of four ſides, and were terminated by a point compoſed of two triangular planes. He adds, that this ſalt doubtleſs had its origin from a mixture of the acid of ſulphur and a calcareous earth of an alkaline nature.

This ſalt is found in almoſt all the mineral waters of Germany, and is very juſtly obſerved by Hoffmann to be of the nature of Glauber's ſalt: that it is not nitre is evident from this, that it is not inflammable, nor will yield aquafortis by diſtillation. It ſeems, indeed, true Glauber's ſalt, compoſed of the acid of vitriol, or ſulphur, for this is in both the ſame, and of that alkaline earth which is the baſis of ſea-ſalt: this is its origin, in the veſſels of the chemiſt, as well as in the bowels of the earth, and probably the figure of the cryſtals of that obſerved by Dr. Liſter, was the ſame in the point, as well as in the body, both being quadrilateral columns terminated by pyramids compoſed of a number of triangular planes. Hoffmann, Opera, tom. v. p. 139.

The medicinal waters in the neighbourhood of Paris contain it alſo in a very conſiderable quantity, though leſs than this. It is the opinion of Hoffmann, that when any water before impregnated with a vitriolic acid, in its current under ground, paſſes over this calcareous earth, it as readily joins a part of it with it, as the vitriolic acid does with the ſea-ſalt, for its baſis, in making the common Glauber's ſalt, and thence produces a bitter purging ſalt, of the ſame nature with that; and, indeed, if the acid of ſulphur be mixed with any alkaline ſubſtance, a bitter neutral ſalt is produced, ſomewhat analogous to this, and to the Glauber's ſalt.

Nitrum *Nitratum*, in *Chemiſtry*, the name of a preparation of nitre, made by adding a ſufficient quantity of ſpirit of nitre to a lixivium of pure nitre, and afterwards evaporating it to a pellicle, and ſetting it by to ſhoot. The cryſtals formed by this liquor are perfectly nitrous in their figure, but they will be of an acid taſte.

This preparation of nitre is a good medicine in burning fevers.

Nitrum *Purificatum*, *purified nitre*, is thus prepared: take nitre, or common ſaltpetre, one pound; pure water three quarts and a pint, ſet them on the fire together, and diſſolve the ſalt perfectly by boiling: then ſtrain the hot lixivium through a double flannel, and ſet it over the fire again in an earthen veſſel. Evaporate it gently, till on taking out a little of the liquor in a ſpoon as it cools, there are ſeen threads as it were ſhooting in it; in this ſtate the ſalt is ready to concrete. Set it in a cool place, putting clean ſticks acroſs the veſſel, and the ſalt will form itſelf into extremely pure and beautiful cryſtals on the ſide of the veſſel, but principally on the ſticks. Theſe dried in a colander are fit for uſe. See *Nitrat of* Potash.

This is the beſt of all the preparations of nitre, for medicinal uſe, in its native form. It diſſolves immediately on entering the body, where it wonderfully cools, and thins the blood, giving it a fine florid colour. In all inflammatory diſeaſes attended with condenſations of the blood, this ſalt proves excellently cooling and attenuating. It is given from four or five grains, to ten, twelve, or fifteen at a doſe. Some give more at a time, but it is more adviſable to have the doſes ſmaller, and oftener repeated. It is alſo good in the ſmall-pox, and ſuppreſſions of urine. It is alſo ſaid to be given by many in hæmorrhages with ſucceſs. If there be any caſe in which caution is required, it is in a conſumption where the lungs are ulcerated. Of this purified nitre, a ſafe and powerful alterant is readily and eaſily prepared in the following manner: take an ounce of the nitre, and two ſcruples of cochineal, in fine powder; boil theſe in five or ſix ounces of water; filter the liquor, and afterwards evaporate it to a dryneſs, ſtirring it continually as it thickens, and a fine purple powder will be then produced, fit to be given in the form of bolus, pills, powder, &c.

Nitrum *Vegetans*, a name given by the chemiſts to a preparation of nitre, which very readily ſhoots out into beautiful cryſtallizations. If, in making Glauber's ſpirit of nitre, there are uſed four parts of nitre, and one of oil of vitriol, and the ſpirit be entirely driven off, the white ſalt remaining dry in the retort, on being expoſed to the open air, will ſoon be covered with a thick and long down, as if it grew; but if this ſalt be diſſolved in water, and then ſtrained, and evaporated to a dryneſs, in a cylindrical glaſs, and kept expoſed to the open air, its upper ſurface will often appear covered with beautiful branching little plants, all which will diſſolve away upon the application of heat, and leave the ſurface even; but upon expoſing the veſſel again to the open air, in a quiet place, they will grow again as before, thus ſeveral times exhibiting the reſuſcitation of plants, as it were from their own aſhes.

Some chemiſts have formed ſeveral fables upon ſome ſuch baſis as this; and very probably the whole ſecret of their operations was no more than a concealed fraud of this kind, this having nothing to do with vegetation.

Nitrum *Vitriolatum*, a preparation of nitre made as follows: diſſolve the maſs left in the retort after diſtillation of a ſpirit of nitre, in about eight times its weight of water; filtrate

filtrate the ſolution, and when perfectly clear, evaporate the liquor to ſuch a ſtandard, that the ſalt will no longer be ſuſtained in it; then ſet it in a cool place, and collect the ſalt as it ſhoots, laying it in an earthen colander to dry. This is of much the ſame virtues with tartar vitriolated, and is frequently ſold under its name.

NITTA, in *Geography*, a town of Japan, in the iſland of Niphon; 50 miles N.N.W. of Jedo.

NITTANY, a mountain of Pennſylvania, between the Juniatte and the W. branch of Suſquehannah river.

NITTENAU, a town of Bavaria, on the Regen; 15 miles N.N.E. of Ratiſbon.

NITTLES, in *Sea Language*. See KNITTLES.

NIVALIS, in *Ornithology*. See EMBERIZA *Nivalis*.

NIVARIA, in *Ancient Geography*, a town of Spain, on the route from Emerita to Cæſarea Auguſta, according to the Itinerary of Antonine, between Septimonca and Cauca; 22 miles from the former, and at the ſame diſtance from the latter.

NIVELLE, DE LA CHAUSSÈE PETER CLAUDE, in *Biography*, a dramatic writer, was born at Paris in 1692, of an ancient and reſpectable family. He was educated chiefly at the Jeſuits' college, and ſtudied rhetoric and philoſophy at Pleſſis. His uncle was high in office, and could have introduced the young man into ſituations that would have led to wealth, reſpectability, and honour, but he had no deſire of the great things of this world, and choſe rather to indulge his taſte for literature. His firſt publication was "Epitre de Clio à M. de Berey," in which he attacked his friend La Motte's ſyſtem of proſe-poetry. This poem was highly applauded; and being urged by his friends to turn his thoughts to dramatic compoſitions, he produced a comedy, entitled "La Fauſſe Antipathie." This piece was ſufficiently ſucceſsful to encourage him to proceed, and his next comedy, "Le Prejugè à la Mode," was received with an applauſe that ſurpaſſed his moſt ſanguine expectations. This was followed by "L'Ecole des Amis," and by the tragedy of "Maximinian." His reputation gained him an admiſſion into the French Academy, but at the ſame time it excited againſt him the envy and jealouſy of his contemporarics. He therefore choſe to bring out his next comedy of "Melanide," as the work of an unknown author. By this artifice he eluded oppoſition, and obtained a ſucceſs equal to the merits of his performance, which is reckoned his maſter-piece. His biographer ſays, that the "Ecole des Méres" is by ſome preferred to it, and that his "Governante" is the favourite with others. Of all theſe works, the peculiar characteriſtics are, according to D'Alembert, that they form a ſchool of morals: that they breathe an ardent ſpirit of virtue, and inſpire the love of it. Piron, jealous of the ſucceſs of the "Melanide," ridiculed the moral ſtrains of its author, and jeeringly aſked a friend who was going to the performance, if "he was intending to hear father La Chauſſèe preach." This jeſt was not forgotten; and Nivelle, though a man of amiable diſpoſitions, oppoſed the election of Piron when he was a candidate for a ſeat in the Academy. He tried his powers in other departments of the drama, and compoſed a kind of romantic paſtoral, entitled "Amour pour Amour," and ſeveral other farces and pieces of low humour. His celebrity is, however, chiefly founded upon his grave comedies, for in the ſingle tragedy which he attempted, he failed. He died in 1754, at the age of 62. His theatrical works were publiſhed at Paris in five volumes, 12mo. 1763.

NIVELLE, GABRIEL NICHOLAS, was born at Paris about the year 1687. Feeling an early inclination to retirement and ſtudy, he entered the ſeminary of St. Magloire, belonging to the congregation of the Oratory, where he continued till that community was diſperſed in 1723. After this he was nominated prior commendatory of St. Gerèon, in the diocèſe of Nantes. In the year 1730, he was impriſoned for four months in the Baſtile, on account of his oppoſition to the bull Unigenitus. He died in 1761, at the age of 74. He is principally known by a work entitled "An Account of the Proceedings in the Faculty of Theology at Paris, on the Subject of the Conſtitution Unigenitus," in ſeven volumes 12mo, and ſome other pieces connected with the ſame ſubject.

NIVELLES, in *Geography*, a town of France, and principal place of a diſtrict, in the department of the Dyle, formerly capital of Wallon Brabant, to which belonged the privilege of coining money; 15 miles S. of Bruſſels. It is divided into two parts, one containing 3230 inhabitants, and its canton 9324, on a territory of 145 kiliometres, in 10 communes, and the other, comprehending 3307 inhabitants, and its canton 11,005, on a territory of 100 kiliometres, in 11 communes.

NIVERNOIS, LOUIS-JULES MANCINI, *Duke of*, in *Biography*, was born at Paris in 1716. He was brought up to the military ſervice, and after he had ſerved in the army ſome time, he was nominated ambaſſador to Rome, and then to Berlin, where he made himſelf very acceptable to the great Frederic. In 1763 he was entruſted with the important negociation of the definitive treaty of peace at London. In every concern of this kind, in which he was engaged, he maintained the character of a prudent and enlightened miniſter, who united amenity of manners with the dignity of his ſtation. After his return to Paris he devoted himſelf entirely to letters, and by ſome publications he obtained an admiſſion into the French Academy, and that of inſcriptions. This worthy and excellent man lived to be a ſufferer from the revolution, and was committed to priſon during the tyranny of Robeſpierre, but fortunately eſcaped the guillotine, and when that blood-thirſty wretch paid the forfeit of his crimes, Nivernois was releaſed. He died in 1798, at the age of eighty-two. His works were publiſhed collectively in eight volumes not long before his death.

NIVERNOIS, in *Geography*, a province of France before the revolution, the capital of which was Nevers. This province, which lies between 46° 45′ and 47° 35′ N. lat., and between 2° 55′ and 4° E. long., is of an oval form, tolerably fertile, and yielding grain, wine, fruits, and paſture. It contains pit-coal, iron mines, and mineral ſprings. Three of its rivers are navigable, *viz.* the Loire, the Allier, and the Yonne. It is now the department of the *Nyevre*, which ſee.

NIVERNOIS *Bay*, a large bay at the eaſtern extremity of lake Ontario.

NIVERS, in *Biography*, muſic-maſter and organiſt of St. Sulpice at Paris, publiſhed, in 1667, a treatiſe on compoſition, and many other works on chanting, plain-chant, le chant Gregorien, &c. And when the ſyllable *ſi* was firſt propoſed for the 7th of the key of C natural, he wrote a book on the gammut of *ſi*, and an elementary tract, called "Muſique des Enfans," together with twelve books for the organ. Laborde.

NIVILLE, in *Geography*, a town of France, in the department of the Oiſe, and chief place of a canton, in the diſtrict of Beauvais. The place contains 131, and the canton 9854 inhabitants, on a territory of 202½ kiliometres, in 22 communes.

NIUKCHEVSKOI, a town of Ruſſia, in the province of Uſting, on the Sula; 24 miles S. of Uſt Silolſk.

NIURUNDA, a town of Sweden, in the province of Medelpadia;

Medelpadia; 10 miles S. of Sundſwall.—Alſo, a river of Sweden, which riſes in the province of Harjeadalen, bearing the name of "Liunga," till it arrives at Hufro, in the province of Medelpadia: here it changes its name, and after croſſing the province, runs into the gulf of Bothnia, five miles S. of Sundſwall.

NIWA, a town of Sweden, in Weſt Bothnia, ſituated on the Tornea; 16 miles N. of Tornea.

NIXONTON, a poſt-town of America, in North Carolina, and capital of Paſquotank county, containing a court-houſe, gaol, and a few dwelling-houſes; 28 miles N.E. of Edenton.

NIZA, a town of Portugal, in the province of Alentejo; 15 miles N.N.W. of Portalegre.

NIZAMBADDA, a town of Hindooſtan, in the circar of Cicacole; 10 miles N.E. of Cicacole.

NIZAMPATAM, a town of Hindooſtan, in the circar of Guntoor, at one of the mouths of the river Kiſtnah, on the coaſt of the bay of Bengal; 34 miles S.W. of Maſulipatam. N. lat. 15° 55'. E. long. 80° 48'.

NIZAMPET, a town of Hindooſtan, in the circar of Aurungabad; 15 miles W. of Aurungabad.

NIZAO, a river of Hiſpaniola, which runs into the ſea, three miles E. of cape Nizao.

NIZEGORODSKOE, a province of Ruſſia, bounded on the N. by Koſtromſkoe, on the W. by Vladimir and Tambov, on the S. by Penzenſkoe, and on the E. by Kazan and Simbirſk; about 160 miles long, and 100 broad. The capital is Niznei Novogorod. N. lat. 54° 10' to 57°. E. long. 42° to 46°.

NIZNOTOSMANSKOI, a town of Ruſſia, in the government of Archangel, on the Dwina; 48 miles E. of Schenkurſk.

NIZZA *de la Paglia*, a town of France, in the department of the Tanaro, on the river Belbo; 7 miles N.W. of Acqui. N. lat. 44° 48'. E. long. 8° 28'.

NIZZOLI, Mario, in *Biography*, an elegant ſcholar of the ſixteenth century, was born at Breſcello, in the duchy of Modena, in the year 1498. Of his education nothing is known, but when he was a young man he was invited to reſide with the count Gianfranceſco Gambara of Breſcia, a man illuſtrious for his patronage of letters. To this nobleman Nizzoli acknowledges the higheſt obligations for ſupporting him by his liberality, and favouring him in his literary ſtudies. His work, entitled "Theſaurus Ciceronianus," was undertaken at the inſtance of his patron, and printed at his houſe in 1535. Nizzoli was appointed private tutor to the marquis di Soragna, and was afterwards profeſſor of eloquence in the univerſity of Parma. Here he wrote his work "De veris Principiis et vera ratione Philoſophandi," firſt publiſhed in 1553. In 1562, he was appointed, by prince Veſpaſiano Gonzaga, director and profeſſor of the new univerſity at Sabionetta. At its opening he delivered a Latin oration, which was printed in the following year. In an inſcription to his memory at Breſcello, dated 1576, he is ſaid to have died at the age of ſeventy-eight. Nizzoli was one of the moſt elegant Latin writers of his time. His Theſaurus has been ſeveral times reprinted, with additions, under the title of "Apparatus Latinæ Locutionis." A new edition of the "De veris Principiis Philoſophandi," &c. was printed by Leibnitz, with an illuſtrative preface.

NO, or No-ammon, in *Ancient Geography*, a town of Egypt, mentioned by the ancient prophets Ezekiel and Nahum, and placed by Jerome near Alexandria.

NOACALLY, in *Geography*, a river of Bengal, which runs into the bay of Bengal, N. lat. 22° 45'. E. long. 92° 16'.

NOACHI Columba, in *Aſtronomy*. See Columba.

NOAD, in *Geography*, a town of Hindooſtan, in Madura; 18 miles W.N.W. of Coilpetta.

NOADA, a town of Bengal; 50 miles N.W. of Ramgur.

NOAGUR, a town of Bengal; 23 miles S.E. of Doeſa.

NOAH, in *Biography*, a patriarch and prophet, was the ſon of Lamech, a deſcendant of Seth, the third ſon of Adam, was born in the year 2948 B.C. In his days a general corruption of manners prevailed among the human race, but he had the fortitude to preſerve himſelf uncontaminated by the evil examples which ſurrounded him, and ſecured to himſelf the divine approbation by his piety and other exemplary virtues. He undertook the office of a public preacher of righteouſneſs, and endeavoured, by his exhortations and admonitions, to reform the morals of his contemporaries, and to reſtore true religion among them. His efforts were of no avail, and as the people ſunk deeper under the dominion of vice, they were ſentenced to deſtruction by an univerſal deluge, from the effects of which Noah and his family were ſaved, by being directed to build an ark or veſſel, which ſhould float on the waters, and thus preſerve all thoſe who were admitted into it. This tremendous ruin, recorded in the Old Teſtament, and evidently referred to in various fabulous authors, took place in the year 2349 B.C., when Noah was ſix hundred years old. (See Ark and Deluge.) After this, Noah lived till the year 1998 B.C. in the 950th year of his age. See the book of Geneſis, chap. v.—ix. for various other particulars relating to Noah and his family: ſee alſo Anc. Univer. Hiſt. and Blair's Chronology.

Noah's *Ark*. See Ark.

Noah's *Ark Shell*, in *Natural Hiſtory*, the name of a kind of ſea-ſhell, which authors were always puzzled about referring to any genus, till a late French author has referred it to a new genus he had made under the title *cordiformis*, taking in the bucardia, and triangular heart-ſhells. The cabinets of the curious afford us three ſpecies of this ſhell; the common kind, a yellow and white kind with broad irregular lines, and a variegated kind. We have another ſhell of this genus, which no one ever doubted to belong to it, which yet is of an oblong figure, and ſo much reſembles the Noah's ark, as to plainly ſhew they ought both to be reckoned ſpecies of the ſame genus. This is the oblong bucardium, or ox-heart ſhell, commonly called the *baſtard* Noah's ark.

NOAILLES, Louis Anthony de, in *Biography*, was born in 1651, and being devoted in early live to the duties of the church, he obtained conſiderable preferment. In 1676 he was nominated biſhop of Cahors, from whence he was removed to Chalons, and laſtly to the ſee of Paris in 1695. He laid down capital rules for the conduct of his clergy; but his peace was diſturbed by the Jeſuits in conſequence of the approbation which he gave to Queſnel's Reflections on the New Teſtament. In 1700 he was raiſed to the dignity of cardinal, and on this occaſion Louis XIV. ſaid to him, "I have more pleaſure in procuring for you the cardinal's hat, than you have in receiving it." Notwithſtanding this, the king was afterwards prejudiced againſt him by father Tellier, the Jeſuit. Pope Clement XI. was alſo ſet againſt him, and iſſued his famous bull of *Unigenitus*, on occaſion of Queſnel's book, which Noailles had ſanctioned. The cardinal was exiled, but after the death of Louis, Tellier was baniſhed in his turn, and the cardinal recalled. He died in 1729.

Noailles, Adrian-Maurice, *Duc de*, a celebrated French general, nephew of the preceding, who flouriſhed in the eighteenth century, early devoted himſelf to military purſuits. He ſerved with his father in Catalonia, and afterwards under Vendome, both in Spain and in Flanders. In 1703 he commanded in Rouſillon, and gained ſeveral important advantages over the enemy. In 1710 he made himſelf maſter of Gironne, one of the moſt important places in Catalonia, for which Philip V. created him a grandee of Spain, and Louis XIV. made him field-marſhal. In the ſucceeding reign he was appointed preſident of the council of finances, but when Dubois obtained the aſcendancy at court, Noailles was exiled. On the death of that miniſter he was recalled and reſtored to his place. In 1733 he commanded at the ſiege of Philipſburg, and obliged the Germans to abandon Worms. He afterwards ſerved with high reputation in Italy. He died in 1766.

Noailles, in *Geography*, a town of France, in the department of the Oiſe, and chief place of a canton, in the diſtrict of Beauvais; 7 miles S.E. of Beauvais. The place contains 632, and the canton 8298 inhabitants, on a territory of 185 kiliometres, in 22 communes.

NOAKPOUR, a town of Hindooſtan, in Bahar; 25 miles W.S.W. of Arrah.

NOALE, a town of Italy, in the Treviſan; 9 miles S.S.W. of Trevigio.

NOANAGUR, a town of Bengal, in the province of Tipera; 20 miles N. of Comillah. N. lat. 23° 45′. E. long. 91° 20′.

Noanagur, or *Cutchnagur*, a town of Hindooſtan, and capital of a diſtrict, in the country of Guzerat, near the gulf of Cutch; 178 miles W.S.W. of Amedabad. N. lat. 22° 22′. E. long. 62° 30′.

NOANAMAS, a town of South America, in the province of Choco, chiefly inhabited by Indians; 170 miles N. of Popayan. N. lat. 5° 15′. W. long. 76° 46′.—Alſo, a river of South America, which runs into the Pacific ocean, N. lat. 4° 45′.

NOANGONG, a town of Bengal; 30 miles S. of Rajemal.

NOARA, La, a town of Sicily, in the vallcy of Demona; 10 miles S.E. of Patti.

NOB, Nobe, *Noba*, or *Nomba*, in *Ancient Geography*, a ſacerdotal city of Paleſtine, at the fartheſt extremity weſtward of the tribe of Benjamin, and the place where the ark ſome time reſted, after the taking of Shiloh by the Philiſtines, ſo totally ruined by king Saul, on account of the ſmall aſſiſtance which the high prieſt Abimelech had given the fugitive David, that according to St. Jerome, it lay in ruins in his time, which were then viſible at a ſmall diſtance from Dioſpolis.

NOBA, in *Geography*, a ſmall iſland in the Eaſt Indian ſea, near the W. coaſt of Aroo. S. lat. 5° 5′. E. long. 135° 13′.

NOBBER, a ſmall poſt-town of Ireland, in the county of Meath, noted as the birth-place of O'Carolan, the Iriſh bard. It is 33½ miles N.N.W. from Dublin.

NOBILIARY, a collection, or hiſtorical account, of the noble families of a province, or nation.

Chorier has publiſhed a nobiliary of Dauphiné; and Caumartin, another of Provence. The Germans are particularly careful of their nobiliaries, to keep up the purity of their families.

NOBILISSIMUS, in *Antiquity*, a title, or quality, given to the princes of the imperial family.

F. Doucine advances, that the title nobiliſſimus was firſt given under the emperor Juſtin; others find the title *nobilis Cæſar*, or *N. C.* that is *Nobiliſſimus Cæſar*, on medals long before that time, even as early as Trajan. Spanheim and Joubert, indeed, ſet this title on medals no higher than the time of Philip the Younger; though it appears earlier in ſome inſcriptions; ſo that even Mr. Tillemont is miſtaken, where he ſays, the quality of nobiliſſimus is not to be found in hiſtory before the time of Conſtantine the Great, who firſt gave it to his two brothers; after which it was attributed to ſuch of the emperor's children as were not Cæſars. See Cæsar.

Triſtan adds, that the Cæſars bore the title of *nobiliſſimi* in all ages; but that the *nobiliſſimate* firſt became a diſtinct independent dignity in the time of Conſtantine the Great.

NOBILITY, a quality that dignifies, or renders a thing noble; particularly, that raiſes a perſon poſſeſſed thereof above the rank of a peaſant or commoner.

In England, indeed, the term nobility is reſtrained to degrees of dignity above knighthood. Every where elſe nobility and gentility, or gentry, are the ſame. See Gentleman.

Some refer the origin of nobility in Europe to the Goths: who, after they had ſeized a part of Europe, rewarded their captains with titles of honour, and called them *nobles*, *nobiles*, to diſtinguiſh them from the common people.

Nobility, in England, is only conferred by the king, and that by writ or by patent, in virtue whereof it becomes hereditary. In other countries there are other ways of acquiring it.

The nobility of England is called the *peerage of England*. Its degrees are only five; *viz.* that of a duke, a marquis, earl or count, viſcount, and baron. See under Duke, Marquis, &c.

The diſtinction of rank and honours is neceſſary in every well governed ſtate, in order to reward ſuch as are eminent for their ſervices to the public, in a manner moſt agreeable to themſelves, and without burthen to the community; and at the ſame time to excite in others a ſpirit of laudable emulation. In our mixed and compounded conſtitution, a body of nobility is peculiarly neceſſary, as a barrier to withſtand the encroachments both of the crown and of the people. It creates and preſerves, ſays judge Blackſtone, that gradual ſcale of dignity which proceeds from the peaſant to the prince; riſing like a pyramid, from a broad foundation, and diminiſhing to a point as it riſes. It is this aſcending and contracting proportion that adds ſtability to any government; for when the departure is ſudden from one extreme to another, we may pronounce that ſtate to be precarious. The nobility, therefore, conſtitutes the pillars, which are reared from among the people, more immediately to ſupport the throne; and if that falls, they muſt alſo be buried under its ruins. And as titles of nobility are thus expedient in the ſtate, it is alſo expedient that their owners ſhould form an independent and ſeparate branch of the legiſlature. See Parliament.

The privileges of the Engliſh nobility are very conſiderable: they are all eſteemed as the king's hereditary counſellors, and are privileged from all arreſts, unleſs for treaſon, felony, breach of peace, condemnation in parliament, and contempt of the king. No ſupplicavit can be granted againſt them; no capias, or exigent, ſued againſt them for action of debt, or treſpaſs; and no eſſoign lies againſt them: in criminal caſes they are only to be tried by a jury of peers, who are not put to their oath; but their verdict upon their honour ſuffices. They alſo anſwer to bills in chancery upon their honour, and not upon their oath; but when they are examined

mined as witneſſes, either in civil or criminal caſes, they muſt be ſworn. In their abſence from parliament, they are allowed a proxy to vote for them; and in all places of truſt they are allowed to conſtitute deputies, by reaſon of the neceſſity the law ſuppoſes them under of atttending the king's perſon. The honour of peers is ſo highly tendered by the law, that it is much more penal to ſpread falſe reports of them and certain other great officers of the realm, than of other men: ſcandal againſt them being called by the peculiar name of "ſcandalum magnatum," and ſubjected to peculiar puniſhments by divers ancient ſtatutes. (3 Edw. I. c. 34. 2 Ric. II. ſt. 1. c. 5. 12 Ric. II. c. 11.) A peer cannot loſe his nobility but by death or attainder. It has been ſaid, indeed (Moor. 678.), that if a baron waſtes his eſtate, ſo that he is not able to ſupport the degree, the *king* may degrade him; but it is expreſsly held by later authorities (12 Rep. 107. 12 Mod. 56.) that a peer cannot be degraded but by act of parliament. See PEERS and PARLIAMENT.

Guillim obſerves, that if an appeal of murder, or felony, be ſued by a commoner againſt a peer, he ſhall be tried by commoners, not peers. See APPEAL.

No peer may go out of the kingdom without the king's leave: if any have leave, he is to return upon the king's writ, or to forfeit goods and chattels.

Anton. Matthæus obſerves, that nobility, among the Romans, was a quite different thing from what it is among us. The nobles, among the Romans, were either thoſe raiſed to the magiſtrature, or deſcended from magiſtrates: there was no ſuch thing as nobility by patent.

Bartoli ſays, that doctors, after they have held a profeſſor's chair in an univerſity for twenty years, become noble, and are entitled to all the rights of counts.

But this claim is not admitted at court, &c. though Bartoli's ſentiments be backed with thoſe of ſeveral other authors, particularly Chaſſanæus, in his Conſuetudin. Burgundiæ; Boyer ſur la Coûtume de Berry; Faber C. de Dig. Def. 9. &c. which laſt, however, reſtrains Bartoli's rule to doctors in law, and prince's phyſicians.

By an edict of the French king, in 1669, it is declared, that trade ſhall not derogate from nobility, provided the perſon do not ſell by retail.

In Bretagne, by ancient cuſtom, a nobleman loſes nothing by trading even in retail: but he re-aſſumes all his rights as ſoon as he ceaſes to traffic, his nobility having ſlept all the time. In Germany, a woman, not noble by birth, doth not become, *v. gr.* a counteſs, or baroneſs, by marrying a count, or baron: a lady of the higher degree, indeed, becomes a princeſs by marrying a prince; but this does not hold of a lady of the lower nobility.

On the coaſt of Malabar, children are only capable of being noble by the mother's ſide: it being allowed them to take as many huſbands as they pleaſe, and to quit them whenever they think good.

NOBLE, NOBILIS, a perſon who has a privilege which raiſes him above a commoner, or peaſant, either by birth, by office, or by patent from his prince.

The word comes from the Latin *nobilis;* formed from the ancient *noſcibilis, diſtinguiſhable, remarkable.*

In England, the word noble is of a narrower import than in other countries; being confined to perſons above the degree of knights; whereas, abroad, it comprehends not only knights, but what we ſimply call *gentlemen.*

The nobles of England are alſo called *pares regni,* as being *nobilitatis pares,* though *gradu impares.*

The Venetian nobleſſe is famous: it is in this that the ſovereignty of the ſtate reſides. It is divided into three claſſes. The firſt only comprehends twenty-four families.

The ſecond includes the deſcendants of all thoſe who were entered into the golden book, in 1289, and deſtined to govern the ſtate, which then began to be ariſtocratic.

The third conſiſts of ſuch as have bought the dignity of noble Venetians.

This laſt claſs is only admitted to the inferior employs; the two former, to all indifferently.

The title of noble Venetians is ſometimes alſo given to foreign kings, princes, &c.

NOBLE alſo denotes a money of account, containing ſix ſhillings and eight-pence.

The noble was anciently a real coin, under the denomination of *Roſe-noble.*

Authors obſerve, that there has not been any piece of gold and ſilver of this name coined with us ſince 9 Hen. V. They were firſt coined by Edw. III. in 1334.

The noble contained 80*d.* the ſame with the preſent money of account. Its half was called *obolus,* containing 40*d.* its fourth part the *quadrans,* or farthing in thoſe days, 20*d.*

NOBLE, EUSTACHE LE, in *Biography,* a copious and very miſcellaneous writer, was born in 1643, of a diſtinguiſhed family at Troyes. He was educated for the profeſſion of the law, and roſe by his talents to the poſt of procureur-general in the parliament of Metz. He obtained a high reputation, but was charged with having forged certain acts of court to his own emolument. Being committed to the Chatelet, he was condemned to an amende-honorable, and baniſhed for nine years; from this ſentence he appealed, and was transferred to the Conciergerie. After this, for ſome miſconduct with reſpect to Gabrielle Perreau, known by the name of La Belle Epicierc, he was again ſentenced to be baniſhed for ſeveral years. He, however, obtained permiſſion to remain in France, on the condition of ceaſing to execute any judiciary office. His misfortunes produced no amendment in his life and morals, but he continued as diſſipated as ever till his death in 1711, at the age of ſixty-eight. He was reduced to ſuch a ſtate of indigence, that he was buried at the charge of the pariſh, though his works are ſaid to have produced above 100,000 crowns to the publiſhers. Theſe have been collected in nineteen volumes 12mo. They have been divided into three claſſes. 1. The ſerious, conſiſting of hiſtorical and political pieces, and ſome indeed, notwithſtanding the looſeneſs of his character, on the ſubject of religion; of theſe, his "Entretiens Politique ſur les Affaires du Tems," a periodical publication, was highly popular on account of its pleaſantry and low wit. 2. The romantic, compriſing a number of works, half hiſtory and half romance. 3. The poetical, conſiſting of tranſlations, fables, tales, comedies, epiſtles.

NOBLEBOROUGH, in *Geography,* a townſhip of America, in Lincoln county, Maine, incorporated in 1788, and containing 804 inhabitants; 10 miles S.E. of Newcaſtle. —Alſo, a town in the Herkemer county, New York, on the head-waters of Canada creek.

NOBODY KNOWS WHAT, a name given by Capt. Cook to the northern arm of Duſky bay.

NOBREGA, MANOEL DA, in *Biography,* the head of the firſt Jeſuits that ever ſet foot in South America, a country in which that body of people have exerted themſelves more than in any other part of the world. He was a native of Portugal, ſtudied firſt at Coimbra, and afterwards at Salamanca, then returning to Coimbra, he graduated in canon law. His father and uncle held high official



ſtations

ſtations at court, which ſeemed to promiſe him almoſt any degree of preferment, but failing to obtain ſome univerſity rank on which his heart was ſet, and which ought to have been awarded him, he rejected the world, as he thought the world had rejected him, and entered, in this fit of diſguſt, the newly eſtabliſhed order of Jeſuits in 1544.

When it was determined that Jeſuit miſſionaries ſhould be ſent to Braſil, Nobrega was nominated head of the miſſion, and he, with five others, ſet ſail with Thomé de Souſa, the firſt governor-general of Braſil, in February 1549. They immediately began that ſyſtem of kindneſs and conciliation towards the natives of South America, from which the Jeſuits never deviated, and on which they eſtabliſhed their empire in Paraguay. Nobrega was as able a ſtateſman as he was a miſſionary, and to him it was owing, that the French did not ſucceed in eſtabliſhing themſelves in Rio Janeiro, and dividing Braſil with the Portugueſe, or, perhaps, ejecting them from it. He was nominated vice-provincial of Brazil in 1550, and provincial in 1553, when that country was made a ſeparate province. He died in 1570, at the age of fifty-three, but worn out with the fatigues of a miſſionary life. Gen. Biog.

NOBSQUASSIT, or Nobscusset, in *Geography*, the N.E. part of Yarmouth, in Barnſtaple county, Maſſachuſetts, in which are 25 ſalt-works, that annually produce 500 buſhels of marine ſalt.

NOBUTPOUR, a town of Hindooſtan, in Benares; 21 miles E. of Benares.

NOCARIO, a town of the iſland of Corſica; 12 miles N.E. of Corte.

NOCE', a town of France, in the department of the Orne, and chief place of a canton, in the diſtrict of Mortagne; five miles E. of Beleſme. The place contains 1161, and the canton 10,667 inhabitants, on a territory of 182½ kiliometres, in 18 communes.

NOCEA, a town of European Turkey, in the Morea; 20 miles E. of Miſitra.

NOCERA, a town of Italy, in the duchy of Spoleto, the ſee of a biſhop; 16 miles N.E. of Spoleto. N. lat. 43° 7'. E. long. 12° 48'.

Nocera *delli Pagani*, a town of Naples, in Calabria Citra, the ſee of a biſhop, ſuffragan of Salerno; containing 12 pariſh churches, and ſix convents. This town, anciently called "Nuceria Alphatorna," and being a Roman colony, had the privilege of coining money. It appears a cluſter of villages, and is ſaid to contain 30,000 inhabitants; 20 miles S.E. of Naples. N. lat. 40° 44'. E. long. 14° 27'.

NOCERIANA Terra, *Earth of Nocera*, in the *Materia Medica*, a white earth, being a ſpecies of bole, uſed in medicine in Germany, Italy, and ſome other parts of the world, but not known in the Engliſh ſhops. It is found at Nocera, in Umbria, whence its name. It is now dug principally about Macerata, a city in the marquiſate of Ancona, in the pope's territories, and is in great eſteem in malignant fevers, and againſt the bites of venomous animals.

It is a denſe earth, of a greyiſh-white, very hard, and of an inſipid taſte, and does not effervеſce with acid menſtruums.

NOCKAMIXON, in *Geography*, a townſhip of America, in Buck's county, Pennſylvania, containing 846 inhabitants.

NOCKLE, in *Rural Economy*, a provincial term often applied to a mallet or beetle. It is ſometimes written *knockle*.

NOCOR, in *Geography*, a river of Morocco, which runs into the Mediterranean, N. lat. 35° 15'.

NOCTAMBULATIO, in *Medicine*. See Somnambulism.

NOCTANTER, in *Law*, is the name of a writ iſſuing out of the Chancery, and returnable in the King's Bench; given by the ſtatute of Weſt. 2. 13 Ed. I. cap. 46. by virtue of which ſtatute, where any one having right to approve waſte ground, &c. makes and erects a ditch or a hedge, and it is thrown down in the night-time, and it cannot be known by a verdict of aſſize or jury, by whom; if the neighbouring vills will not indict ſuch as are guilty, they ſhall be diſtrained to make again the hedge or ditch at their own coſts, and to anſwer damages. The word *noctanter* is ſo neceſſary in an indictment of burglary, that it hath been adjudged inſufficient without it.

NOCTIBO, in *Ornithology*, the name given by the Portugueſe to a ſmall Braſilian bird, a ſpecies of the *goat-ſucker*, or *churn-owl*, more known among naturaliſts by its Braſilian name *ibijau*.

NOCTILIO, in *Zoology*. See Vespertilio *Leporinus*.

NOCTILUCA, among *Naturaliſts*, a ſpecies of phoſphorus, ſo called becauſe it ſhines in the night, without any light being thrown on it: ſuch is the phoſphorus made of urine; by which it ſtands diſtinguiſhed from ſome other ſpecies of phoſphorus, which, before they ſhine, muſt be expoſed to the ſun-beams; ſuch is the Bononian-ſtone, &c.

Mr. Boyle, in a particular treatiſe on the ſubject, gives an account of three noctilucæ. The firſt, invented by Krafft, he calls the *conſiſtent*, or *gummous* noctiluca, as being of a texture not unlike that of a cherry-gum. This, on account of its uninterrupted action, was, by the Germans, called the *conſtant* noctiluca; among us it is now known under the denomination of the *ſolid phoſphorus*. The ſecond is liquid, invented by the ſaid Krafft; this is only a diſſolution of the former in a convenient liquor. The third kind was prepared by Mr. Boyle himſelf; and was of a different nature from both the others; for it would not ſhine of itſelf like either of them, but required the contact of the air (though not any external rays or heat) to make it produce light, which would be very durable, in a well ſtopped veſſel. Add, that it was not the body that ſhone, but an exhalation, or effluvium, mixed with the air; on which accounts the inventor gives it the denomination of the *aerial* noctiluca.

The ſame Mr. Boyle, afterwards, prepared another ſort; which from the little pellucid fragments or cryſtals therein, he denominated the *icy* noctiluca. See Phosphorus.

NOCTUA, in *Ornithology*, a ſpecies of owl. See Strix *Noctua*. For other ſpecies of *Noctua*, ſee Strix.

Noctua *Aurita*, a name by which ſome have called the ſmaller ſpecies of the horn-owl, more uſually diſtinguiſhed by the name *otus*.

Noctua *Canora*, a name given by Nieremberg to a bird of the Spaniſh Weſt Indies, called by the natives *chicuatli*, and ſometimes kept by the Spaniards in cages. See Chicuatli.

Noctua *Minor*, a name given by Mr. Ray to the *keutzlin*, or, as others call it, the *ſchaffilt*, a very beautiful bird of the owl kind, and not exceeding the ſize of the common thruſh. See Strix *Paſſerina*.

NOCTUINI Oculi, a name given by ſome to grey eyes, from their reſembling thoſe of the *noctua*, or *owl*.

NOCTUOLENT, among *Botaniſts*, a name given to ſuch plants as ſmell ſtrongeſt in the night-time. See Dog-*Roſe*.

NOCTURNAL, ſomething that relates to night, *nox*;

in contradiſtinction to diurnal. In this ſenſe we ſay, nocturnal aſſemblies; nocturnal walks; nocturnal pollutions, &c.

NOCTURNAL *Pains* are a frequent concomitant of venereal diſorders, which can only be palliated with narcotics; nothing but a mercurial courſe, or a long-continued uſe of diet-drinks, can entirely remove them.

NOCTURNAL *Arch*, in *Aſtronomy*, the arch of a circle deſcribed by the ſun, or a ſtar, in the night.

*Semi*-NOCTURNAL *Arch of the Sun* is that portion of a circle he paſſes over between the lower part of our meridian, and the point of the horizon in which he ariſes; or between the point of the horizon in which he ſets, and the lower part of our meridian.

NOCTURNAL, or *Noctarlabium*, is more particularly uſed for an inſtrument, chiefly uſed at ſea, to take the altitude or depreſſion of ſome of the ſtars about the pole, in order to find the latitude, and the hour of the night.

There are nocturnals of various contrivances, ſome of them projections of the ſphere; ſuch as the hemiſpheres, or planiſpheres, on the plane of the equinoctial: thoſe ordinarily uſed by the ſeamen are two; the one adapted to the polar ſtar, and the firſt of the guards of the Little Bear; the other to the pole-ſtar, and the pointers of the Great Bear.

NOCTURNAL, *Conſtruction of the*. The inſtrument conſiſts of two circular plates (*Plate* I. *Navigation*, *fig.* 10.) applied on each other. The greater, which has a handle to hold the inſtrument, is about 2½ inches diameter, and is divided into twelve parts, agreeing to the twelve months; and each month ſubdivided into every fifth day; and ſo, as that the middle of the handle correſponds to that day of the year, wherein the ſtar here regarded has the ſame right aſcenſion with the ſun.

If the inſtrument be fitted for two ſtars, the handle is made moveable. The upper left circle is divided into twenty-four equal parts, for the twenty-four hours of the day, and each hour ſubdivided into quarters, as in the figure. Theſe twenty-four hours are noted by twenty-four teeth; to be told in the night. Thoſe at the hours twelve are diſtinguiſhed by their length. In the centre of the two circular plates, is adjuſted a long index, A, moveable upon the upper plate. And the three pieces, *viz.* the two circles and index, are joined by a rivet which is pierced through the centre, with a hole two inches in diameter for the ſtar to be obſerved through.

NOCTURNAL, *Uſe of the*. Turn the upper plate till the longeſt tooth, marked 12, be againſt the day of the month on the under plate; then, bringing the inſtrument near the eye, ſuſpend it by the handle, with the plane nearly parallel to the equinoctial; and viewing the pole-ſtar through the hole of the centre, turn the index about, till, by the edge coming from the centre, you ſee the bright ſtar or guard of the Little Bear (if the inſtrument be fitted to that ſtar); then that tooth of the upper circle, under the edge of the index, is at the hour of the night, on the edge of the hour-circle; which may be known without a light, by accounting the teeth from the longeſt, which is for the hour 12.

NOCTURNAL *Crimes*, *Prevention of*. See HOMICIDE.

NOCTURNAL *Pollution*. See POLLUTION.

NOCUM, in *Geography*, a town of Hindooſtan, in the circar of Sirhind; 20 miles N.E. of Tannaſar.

NOCUMENTI ASSISA. See ASSISA.

NODAN, in *Geography*, a town of Pruſſia, in the province of Samland, on the coaſt of the Baltic; 14 miles N. of Pillau.

NODAR, or NOUDAR, a town of Portugal, in Alentejo; 21 miles S.E. of Mourao.

NODATED HYPERBOLA, a kind of hyperbola, which, in turning round, decuſſates or croſſes itſelf.

NODDLE'S ISLAND, in *Geography*, a ſmall, pleaſant, and fertile iſland in Boſton harbour, Maſſachuſetts, about two miles E.N.E. of the town; occupied as a farm, and yielding large quantities of hay.

NODDY, in *Ornithology*. See STERNA *Fuliginoſa*.

NODE denotes, in *Surgery*, a ſwelling of the perioſteum, tendons, or bones, from a venereal cauſe. The progreſs of the diſeaſe in this form is extremely ſlow, and attended with little pain. In ſome caſes, however, the pain is conſiderable, particularly in the night time. Nodes continue a long time before matter is formed, and when ſuppuration does take place, it is of a very imperfect kind.

Sudden ſwellings of the perioſteum, without nocturnal pains, are not venereal.

The bones which are peculiarly liable to nodes, are ſuch as are ſuperficial; for inſtance, the front ſurface of the tibia, the bones of the cranium, the triangular part of the ulna below the olecranon, &c.

The treatment of nodes is conſidered in the article LUES *Venerea*.

NODERMALM, in *Geography*, an iſland of Sweden, on which ſtands a part of the city of Stockholm. On it are a palace and opera-houſe, an ancient arſenal now converted into a theatre, three churches, an obſervatory, &c.

NODES, in *Aſtronomy*, the two points wherein the orbit of a planet interſects the ecliptic.

Such are the two points C and D (*Plate* XVII. *Aſtron. fig.* 7.) of which the node C, where the planet aſcends northwards above the plane of the ecliptic, is called the *aſcending* node, the *northward* node, and the *head of the dragon;* and is thus marked, ☊.

The other node D, where the planet deſcends to the ſouth, is called the *deſcending* node, the *ſouthward* node, or the *dragon's tail;* thus marked, ☋. See DRAGON'S *head* and *tail*.

The right line D C, wherein the two circles interſect, is called *the line of the nodes*.

It appears from obſervation, that the line of the nodes of all the planets conſtantly changes its place, and ſhifts its ſituation *in antecedentia*; i. e. from eaſt to weſt, contrary to the order of the ſigns.

Thus, by a retrograde motion, the line of the moon's nodes, moving at the rate of about 19⅓° in a year, finiſhes its circuit in eighteen years two hundred and twenty-five days; in which time, after having receded from any point of the ecliptic, it returns to the ſame. See MOON.

Sir Iſaac Newton has not only ſhewn, that this motion ariſes from the action of the ſun, but has calculated, with great ſkill, all the elements and varieties in this motion, from its cauſe.

In order to underſtand the action of the ſun in this caſe, we muſt conceive the plane of the moon's motion to paſs always through the centre of the earth and the centre of the moon, and to be a plane in which the right line joining their centres, and the right line that is the direction of the moon's motion, or the tangent of her orbit, are always found. It is certain, that if the earth and moon were always acted on equally by the ſun, they would deſcend equally towards the ſun; the plane determined always by theſe two lines, would deſcend with them, keeping always parallel to itſelf, ſo that the moon would appear to us to revolve in the ſame plane conſtantly, with reſpect to the earth. But the inequalities in the action of the ſun (ſee MOON) will bring the moon out of this plane to that ſide of the plane on which the ſun is, in the half of her orbit that is neareſt the ſun, and towards the

other

other ſide, in the half of her orbit that is fartheſt from the ſun. Whence we ſhall have this general rule for judging of the effect of the ſun on the nodes: that while the moon is in the half of her orbit that is neareſt the ſun, the node towards which ſhe is moving is made to move towards the conjunction with the ſun; and while the moon is in the half of her orbit which is fartheſt from the ſun, the node towards which ſhe is moving is made to move towards the oppoſition; but when the nodes are in conjunction with the ſun, its action has no effect upon them. In the firſt caſe, the moon is brought into a direction which is on the ſame ſide as the ſun is, of that direction which ſhe would follow of herſelf; and the interſection of a plane paſſing through this direction and through the centre of the earth, will cut the ecliptic, on that ſide towards which the moon moves, in a point nearer the conjunction than if there was no action of the ſun to diſturb her motion. In the other caſe, the action of the ſun has a contrary direction, and for the ſame reaſon makes the enſuing node move towards the oppoſition. When the line of the nodes produced paſſes through the ſun, then the ſun, being in the plane of the moon's motion, has no effect to bring her to either ſide; and therefore, in that caſe, the nodes have no motion at all. By applying this reaſoning, it appears, that in every revolution of the moon, the retrograde motion of the nodes exceeds the direct motion, excepting only when the line of the nodes paſſes through the ſun, when there is no motion of the nodes at all. Sir Iſaac Newton finds from the theory of gravity, that the nodes ought to move backward about 19° 18′ 1″ in the ſpace of a year, and the aſtronomical tables make this motion 19° 21′ 21″, whoſe difference is not $\frac{1}{300}$ of the whole motion of the nodes in a year. By a more correct computation of this motion from its cauſe, the theory and obſervation agree within a few ſeconds. (See Moon.) The inclination of the moon's orbit to the ecliptic is alſo ſubject to many variations. When the nodes are in the quarters, while the moon moves from one quarter to the conjunction, the action of the ſun diminiſhes the inclination of the plane of her orbit; the inclination of this plane is leaſt of all when the moon is in the conjunction; it increaſes again as ſhe moves from the conjunction to the next quarter, and is there reſtored nearly to its firſt quantity. When the line of the nodes paſſes through the ſun, the inclination of the moon's orbit is not affected by the action of the ſun; becauſe, in that caſe, the plane of her orbit produced, paſſes through the ſun, and, therefore, the action of the ſun can have no effect to bring the moon out of this plane to either ſide. In this laſt caſe the inclination of the moon's orbit is greateſt; it increaſes as the nodes move towards the quarters; and it is leaſt of all when the nodes are in the quarters, and the moon either in the conjunction or oppoſition. Newton has calculated theſe irregularities from their cauſes, and finds his concluſions agree very well with the obſervations of aſtronomers. When the moon is in the node, ſhe is alſo in the ecliptic, *viz.* twice in each period; when ſhe is at her greateſt diſtance from the nodes, *viz.* in the points E, F, ſhe is ſaid to be in her greateſt north or ſouth latitude, according as ſhe is then on the north or ſouth ſide of the ecliptic.

The moon muſt be in or near one of the nodes when there is an eclipſe, either of the ſun or moon.

The place of the moon's nodes may be determined, either in the ſame way as that of the nodes of the other planetary orbits, or by the following method. In a central eclipſe of the moon, the moon's place at the middle of the eclipſe is directly oppoſite to the ſun, and the moon muſt alſo then be in the node; calculate therefore the true place of the ſun, or, which is more exact, find its place by obſervation, and the oppoſite point will be the true place of the moon, and conſequently the place of its node. (See Moon.) Before the nodes of the planetary orbits can be found, it will be neceſſary to ſhew how to reduce the places of the planets ſeen from the earth to the places ſeen from the ſun, and how to compute the heliocentric latitudes. Let E (*Plate* XVIII. *Aſtronomy, fig.* 1.) be the place of the earth, P the planet, S the ſun, ♈ the firſt point of Aries; draw P $v$ perpendicular to the ecliptic, and produce E S to $a$. Compute, at the time of obſervation, the longitude of the ſun ſeen at $a$, and you have the longitude of the earth at E, or the angle ♈ S E; compute alſo the longitude of the planet, or the angle ♈ S $v$; and the difference of theſe two angles is the angle E S $v$ of "commutation." Obſerve the place of the planet in the ecliptic; and the place of the ſun being known, we have the angle $v$ E S of elongation in reſpect to longitude; hence we know the angle S $v$ E, which meaſures the difference of the places of the planets ſeen from the earth and the ſun; therefore the place of the planet ſeen from the earth being known, the place ſeen from the ſun will be known. Alſo, tang. P E $v$ : rad. :: $v$ P : E $v$ by trig. and rad. : tan. P S $v$ :: $v$ S : $v$ P : ∴ tang. P E $v$ : tan. P S $v$ :: $v$ S : E $v$ :: ſin. S E $v$ : ſin. E S $v$; that is, the ſine of elongation in longitude : ſine of the difference of the longitudes of the earth and planet :: tang. of the geocentric latitude : tan. of the heliocentric latitude. When the latitude is ſmall, S $v$ : E $v$ is very nearly as P S : P E, which, in oppoſition, is very nearly as P S : P S − S E. The "curtate" diſtance S $v$ of the planet from the ſun may be found by this proportion, rad. : coſ. P S $v$ :: P S : S $v$. See Heliocentric Latitude.

Now to determine the place of the node, find the planet's heliocentric latitudes juſt before and after it has paſſed the node, and let $a$ and $b$ be the places in the orbit, $m$ and $n$ the places reduced to the ecliptic; then the triangles $a$ $m$ N, $b$ $n$ N (*fig.* 2.), which we may conſider as rectilinear, being ſimilar, we have $a\,m : b\,n :: \mathrm{N}\,m : \mathrm{N}\,n$; therefore, $a\,m + b\,n : a\,m :: \mathrm{N}\,m + \mathrm{N}\,n\ (m\,n) : \mathrm{N}\,m$, or $a\,m + b\,n : m\,n :: a\,m : \mathrm{N}\,m$; that is, the ſum of the two latitudes: the difference of the longitudes :: either latitude : the diſtance of the node from the longitude correſponding to that latitude. Or, if we take the two latitudes from the earth, it will be very nearly as accurate when the obſervations are made in oppoſition. If the diſtance of the obſervations ſhould exceed a degree, this rule will not be ſufficiently accurate. In this caſe our computations muſt be made for ſpherical triangles in the following manner. Put $m\,n = a$, $a\,m = \beta$, $b\,n = b$, $\mathrm{N}\,m = x$; then by trigon. $\frac{\text{ſin. } \overline{a - x}}{\text{tan. } b} = \text{cotan. N} = \frac{\text{ſin. } x}{\text{tan. } \beta}$, radius being unity: but ſin. $\overline{a - x}$ = ſin. $a \times$ coſ. $x$ − ſin $x \times$ coſ. $a$; hence $\frac{\text{ſin. } a \times \text{coſ. } x - \text{ſin. } x \times \text{coſ. } a}{\text{tang. } b} = \frac{\text{ſix. } x}{\text{tang. } \beta}$; therefore, $\frac{\text{ſin. } a \times \text{tang. } \beta}{\text{tang. } b + \text{coſ. } a \times \text{tang. } \beta} = \frac{\text{ſin. } x}{\text{coſ. } x}$ = tang. $x$.

The longitudes of the nodes of the planets for the beginning of 1750 are, Mercury, 1ˢ 15° 20′ 43″; Venus, 2ˢ 14° 26′ 18″; Mars, 1ˢ 17° 38′ 38″; Jupiter, 3ˢ 7° 55′ 32″; Saturn, 3ˢ 21° 32′ 22″; Georgian, 2ˢ 12° 47′.

To determine the inclination of the orbit, we have $a\,m$ the latitude of the planet, and $m$ V its diſtance upon the ecliptic from the node; hence, ſin. $m$ N : tang. $a\,m$ :: rad. : tang. of the angle N. But the obſervations which are near the node muſt

muſt not be uſed to determine the inclination, as a very ſmall error in the latitude will make a conſiderable error in the angle. The inclination may alſo be found thus: find the angle P S $v$ (*fig.* 1.), then the place of the planet and that of its node being given, we know $v$ N; hence, ſin. $v$ N : tang. P $v$ :: rad. : tang. P N $v$, the inclination of the orbit. See Vince's Elem. of Aſtronomy.

NODHA, in *Geography*, a town of Perſia, in the province of Mecran; 63 miles S.W. of Kidge.

NODHEA, a town of Perſia, in the province of Kerman; 75 miles N.N.E. of Sirgian.

NODINGEN, an iſland of Sweden, near the W. coaſt, in the N. ſea. N. lat. 57° 16′. E. long. 11° 50′.—Alſo, a town of Sweden, in Weſt Gothland; 12 miles N. of Gothenburg.

NODULE, Nodulus, in *Pharmacy*, a bag of medicinal ingredients put into beer, or wine, to give its tincture thereto. Nodules are ſometimes alſo parcels of odoriferous ſimples, tied up in a piece of ſilk, for the patient to be frequently ſmelling to.

NODUS, Knot. See Knot.

Nodus, in *Poetry*, &c. See Intrigue and Plot.

Nodus, or *Node*, in *Dialling*, denotes a point or hole in the gnomon of a dial, by the ſhadow or light whereof, either the hour of the day in dials without furniture, or the parallels of the ſun's declination, and his place in the ecliptic, &c. in dials with furniture, are ſhewn.

Nodus is alſo uſed for a hole in the cieling of a room, or in the window, for the making of a dial on the floor, wall, or the like.

NOË, in *Geography*, a town of France, in the department of the Upper Garonne, on the river Garonne; 17 miles S. of Toulouſe.

NOEL, two iſlands in the Indian ſea, near the coaſt of Siam. N. lat. 10° 33′ to 10° 47′. E. long. 96° 30′ to 96° 48′.

Noels, a kind of air, ſimilar to our Chriſtmas carols, ſung by the common people at the Nativity. The airs of Noels, ſays M. Rouſſeau, ought to have a ruſtic and paſtoral character, agreeable to the ſimplicity of the words, and that of the ſhepherds ſuppoſed to have ſung them in going to render homage to the infant Jeſus in the manger.

NOERZA, in *Zoology*. See Mustela *Lutreola*.

NOESA Bason, in *Geography*, an iſland in the Eaſt Indian ſea, near the S. coaſt of Java, about 25 miles in circumference. S. lat. 6° 36′. E. long. 113°.

Noesa *Cambaz*, or *Pulo Cannibaz*, an iſland in the Eaſt Indian ſea, near the S. coaſt of Java, about 45 miles in circumference. S. lat. 7° 42′. E. long. 109° 22′.

Noesa *Comba*, a ſmall iſland in the Eaſt Indian ſea. S. lat. 5° 20′. E. long. 117°.

Noesa *Laver*, a ſmall iſland in the Eaſt Indian ſea, near the S. coaſt of Ceram. S. lat. 3° 34′. E. long. 129° 10′.

Noesa *Neſſing*, a ſmall iſland in the Eaſt Indian ſea, near the N. coaſt of Timor. S. lat. 8° 9′. E. long. 126° 30′.

Noesa *Seres*, two ſmall iſlands in the Eaſt Indian ſea. S. lat. 5° 15′. E. long. 116° 58′.

NOETIANS, in *Eccleſiaſtical Hiſtory*, diſciples of Noetus, an Epheſian, the maſter of Sabellius.

They only allowed of one perſon in the godhead; *viz.* the Father; and accordingly taught, that it was God the Father that ſuffered on the croſs. An error, ſays Epiphanius, who wrote a hundred years after Noetus, never heard of before; though it is certain there had been other patripaſſians in the church before him.

Being reprehended by his ſuperiors, Noetus made them this anſwer: "What harm have I done? I adore only one God; I own none but him. He was born, ſuffered, and is dead."

NŒUDS. The fixed points in every vibrating ſtring which divide it into aliquot parts, and which produce a different ſound from the whole ſtring, are called nœuds, or knots; for example, of two ſtrings, one of which is triple the length of the other, if the ſhorteſt is cauſed to ſound, the longeſt will likewiſe ſound, not as the whole ſtring, but in uniſon with the ſhorteſt; becauſe the longeſt ſtring then, inſtead of ſounding in its totality, divides itſelf, and only produces the ſound of one of its third parts. The immoveable points, which are the diviſions, act as ſo many bridges, and theſe are what M. Sauveur calls *nodes*, naming them at the ſame time the ſwellings or undulations of the ſeveral aliquot parts where the vibrating ſtring deviates moſt from a right line.

If, inſtead of making another and a ſhorter ſtring ſound, we divide the longeſt by ſome ſmall impediment which will check its vibration without totally ſtopping it, the ſame caſe will ſtill happen in making one of the aliquots ſound; for then both will ſound in uniſon with the ſhorteſt, and we ſhall ſee the ſame *nœuds* and the ſame *bellies* as before.

If the ſhorteſt part is not an exact aliquot of the longeſt, but a common aliquot, then there will be no reſonance, or only that of the ſmalleſt part, unleſs it is ſtruck with ſuch violence as to force the obſtacle, and make the whole ſtring ſound.

M. Sauveur contrived to exhibit theſe nœuds and bellies to the Academy, in a way very clear, by putting bits of coloured paper on the ſtring, for then at the ſound of the aliquot they always ſaw the papers at the bellies fall, and thoſe of the nœuds remain undiſturbed. See a repreſentation of theſe effects *Plate Muſic*. Père Merſenne was the firſt who diſcovered, and demonſtrated theſe natural diviſions of a ſounding ſtring by experiments. Harm. Univ.

NOEWE, in *Geography*, a town of America, in the ſtate of Tenneſſee; 21 miles S. of Knoxville.

NOFESCH, in *Natural Hiſtory*, a word of Hebrew origin, uſed as the name of a precious ſtone. There has been much diſpute among the commentators on the Old Teſtament, what ſtone it was. It ſeems derived from the root *ſuch*, which ſignifies the ruby or carbuncle, and as a derivative of that word, it muſt be ſuppoſed to expreſs a red ſtone, not one of any other colour. As the ruby is ſignified by *ſuch*, this cannot mean the ſame ſtone, and therefore probably meant the garnet, they having no other name, that we know of, for that ſtone, and it being very like the ruby.

NOGALES, in *Geography*, a town of Spain, in Eſtramadura; 20 miles S.S.E. of Badajoz.

NOGARA, a town of Italy, in the department of the Benaco; 13 miles W. of Legrano.—Alſo, a town of the county of Tyrol; nine miles N.E. of Trent.

NOGARCOT, a town of Aſia, in the country of Nepaul, in which is a celebrated pagoda; 50 miles N.E. of Cath'mandu. N. lat. 28° 11′. E. long. 86° 8′.

NOGARO, a town of France, in the department of the Gers, and chief place of a canton, in the diſtrict of Condom; 21 miles S.W. of Condom. The place contains 1559, and the canton 11,700 inhabitants, on a territory of 3274 kiliometres, in 42 communes. N. lat. 43° 45′. E. long. 0° 2′.

NOGAROLA, Lewis, in *Biography*, an Italian man of letters, was deſcended from an illuſtrious family, born at Verona towards the commencement of the 16th century. He applied with great ſucceſs to the ſtudy of the Greek language, and acquired a high reputation by the various Latin

verſions of books written in that tongue. In 1545 he was appointed one of three commiſſioners to whom was committed the care of ſupplying Verona with proviſions in a time of ſcarcity. Soon after this he was ſent to the council of Trent, where he gained much applauſe, by a diſcourſe pronounced before that aſſembly. In 1554 he was made a knight of the republic of Verona, and in the following year he was appointed preſident of the juriſdiction over the work-people in the ſilk-manufactories. He died at Verona in the year 1559. His works were numerous, of which we notice the following. A Latin tranſlation of a work attributed to St. John Damaſcenus, on the ſubject "De iis qui ſidem dormierunt." In the year 1549 he publiſhed at Venice "Apoſtolicæ Inſtitutiones in parvum Libellum collectæ:" to this he annexed his diſcourſe delivered before the council of Trent. In 1552 he printed, in quarto, a Latin treatiſe relating to the periodical increaſe of the Nile, from a very rare work, printed at Milan under the title of "Timotheus, ſive de Nilo, &c." He tranſlated alſo "De Univerſa Natura" of Ocellus Lucanus, which was printed at Venice in 1559; and reprinted at Heidelberg in 1598, and at Cambridge in 1671. Nogarola alſo publiſhed a Latin "Letter to Adam Fumano, canon of Verona, on the perſons of illuſtrious Italian families who have written in Greek," which is given in the Venice edition of Ocellus' work; in the "Opuſcula Mythologica," publiſhed at Cambridge in 1671, and in the "Supplementa et Obſervationes ad Voſſium de Hiſtoricis Græcis et Latinis," by John Albert Fabricius, publiſhed at Hamburgh in 1709. Moreri.

NOGARUOLA, in *Geography*, a town of Italy, in the Veroneſe; 19 miles S.S.E. of Verona.

NOGAT, an iſland at the mouth of the Viſtula, bounded N. by the old Viſtula, E. by the Friſch Haff, S.E. by the Nogat river, and W. by the Viſtula; about 30 miles in length from N. to S., and from five to fifteen broad; well watered and fertile.

NOGATA, a town of Japan, in the iſland of Ximo; 15 miles N. of Taiſero.

NOGAYANS, called alſo *Mankats*, one of the main branches of the Tartars; which, according to the Arabic and Grecian writers, owes its origin to a Mongole chieftain, named Nogay, who, towards the cloſe of the 13th century, was ſent with a ſtrong body of troops by a khan of Kaptſchak to conquer the countries lying beyond the Euxine, and who actually ſubjected the regions from the Don to the Danube, but afterwards ſhook off the ſovereignty of the khans of Kaptſchak, and became the founder of an empire, which was ſoon deſtroyed under his ſucceſſors. After the annihilation of this ſtate, the name of its founder continued in the nation which he had governed; and it is very probable that the Nogayans ſpread themſelves from the Volga to the Ural, and thence again as far as the Irtyſh, and were not driven out of theſe regions by the Kalmuks till the era of the Ruſſian ſovereignty. They now inhabit the Steppes on the N. ſide of the Caucaſian mountains and the Euxine quite to the other ſide of the Danube, and conſiſt of ſeveral larger and ſmaller ſtems, which at times are known to change their place of abode, and even their names. The Nogayans ſubject to Ruſſia, are partly in what was formerly called the Eaſtern Nogay or the Krimean Steppe, partly in the Kuban, and partly diſperſed about the Volga, and in other regions of the empire. The "Eaſtern Nogay" forms the northern larger half of the province of Taurida, denominated by the Ruſſians the "Krimean Steppe." It is about twice as large as the peninſula of the Krim, and was formerly much larger; but in 1739, by the peace of Belgrade, more than half of it came under the Ruſſian ſceptre, which part belongs at preſent to the government of Ekaterinoſlaf. The remainder, which had likewiſe formed a part of the ſtates of the Krimean khans, fell to Ruſſia, on her taking poſſeſſion of the Krim (Crim) in 1783; and this now conſtitutes the circles Melitopol and Dneproviſk in the province of Taurida. The eaſtern Nogay has ſhared the fortune of the Krim, and has been inhabited by the ſame people. The Nogayan Tartars now form a conſiderable part of its population.

The ſecond and at preſent the only main ſeat of the Nogayans is the Kuban (Cuban). The Kubanian Nogays, called alſo the little or black Nogays, are diſtributed into various hordes or ſtems, of which the Kaſay-aut and the Naurus-aut are the moſt remarkable, compoſing together about 10,000 families. It is ſaid that the population of all the eaſtern and Kubanian Nogays amounted, a few years ago, to upwards of 500,000 families; but this is probably an exaggerated account. Beſides theſe, who are lately come under the Ruſſian ſovereignty (Kuban being taken poſſeſſion of by the Ruſſians in 1783), there are, in various parts of the empire, other remains and colonies of this nation of Nogays. Tooke's Ruſſia, vol. i.

NOGELN, a town of Pruſſia, in the province of Samland; 52 miles N. of Königſberg.

NOGENT *Haut Marne*, a town of France, in the department of the Upper Marne, and chief place of a canton, in the diſtrict of Chaumont; nine miles S.E. of Chaumont. The place contains 1949, and the canton 8638 inhabitants, on a territory of 240 kiliometres, in 20 communes.

Nogent-*le-Rotrou*, a town of France, and principal place of a diſtrict, in the department of the Eure and Loire, on the Eure; 12 miles N. of Chartres. The place contains 6780, and the canton 11,552 inhabitants, on a territory of 152½ kiliometres, in 12 communes. N. lat. 48° 20'. E. long. 0° 55'.

Nogent-*Roulebois*, a town of France, in the department of the Eure and Loire, and chief place of a canton, in the diſtrict of Dreux. The place contains 2290, and the canton 10,733 inhabitants, on a territory of 215 kiliometres, in 22 communes.

Nogent-*ſur-Seine*, a town of France, in the department of the Aube, and principal place of a diſtrict; nine miles E S.E. of Provins. The place contains 3208, and the canton 10,152 inhabitants, on a territory of 170 kiliometres, in 17 communes. N. lat. 48 30'. E. long. 3° 35'.

NOGG, in *Rural Economy*, a provincial word often uſed to ſignify ſtrong beer.

NOGHE, in *Geography*, a town of Nubia, on the right bank of the Nile; 50 miles N.E. of Sennaar.

NOGONG, a town of Bengal, capital of the circar of Barbackpour; 50 miles N.E. of Moorſhedabad. N. lat. 24° 48'. E. long. 88° 53'.

NOHOTHA, a river of Thibet, which runs into the Sanpoo; 21 miles W.S.W. of Tankia.

NOHUKUN, a river of Mexico, which riſes in the province of Yucatan, and runs into the bay of Honduras by ſeveral mouths. N. lat. 17° 30'. W. long. 90° 16'.

NOHUTTA, a town of Bengal; 18 miles W. of Nattore. N. lat. 24° 28'. E. long. 88° 46'.—Alſo, a town of Bengal; five miles S.W. of Mahmudpour.—Alſo, a town of Hindooſtan, in Bahar; 33 miles E.S.E. of Durbungah. N. lat. 25° 59'. E. long. 86° 40'.

NOIA, a town of Naples, in the province of Otranto; five miles S.E. of Nardo.—Alſo, a town of Naples, in Baſilicata;

licata; 12 miles S.S.W. of Turſi.—Alſo, a town of Naples, in Bari; 25 miles E.S.E. of Bari.

NOIERA, a town of Naples, in Principato Citra; ſeven miles W.N.W. of Salerno.

NOILSBERG, a town of Bohemia, in the circle of Leitmeritz; 18 miles N.W. of Leitmeritz.

NOIR, John le, in *Biography*, who flouriſhed in the 17th century, was the ſon of a counſellor of Avignon, and intended for the church. Having excellent natural abilities, which he improved by a liberal education, he was ordained prieſt, and acquired a high reputation at Paris and other cities, as an eloquent and popular preacher. As a reward of his merit, he was promoted to the canonry and prebend in the cathedral church of Seez. Jealous of his fame, the Jeſuits attempted to injure his credit, and even directed againſt him the fury of a number of fanatics who appeared in Normandy. Le Noir was a zealous defender of the principles of Janſeniſm; the fanatics, juſt referred to, aſſembled where he was preaching a courſe of ſermons, and having erected an image of the Virgin at the croſſing of the ſtreets, chanted litanies before it every evening, into which were introduced the words "Virgo extirpatrix Janſeniſtarum." Under the feet of this image was the figure of a black ſerpent, by which they meant to deſignate the prebendary of Seez. They uſed other means likewiſe to deſtroy the influence of Le Noir. At length the civil power thought it right to interfere, and after committing the ring-leaders to priſon, diſperſed the reſt. After this he had a conteſt with his biſhop, who obtained againſt him a *lettre de cachet*, in the year 1663, by which M. le Noir, under the pretence of having propagated erroneous notions, was, for a time, exiled to Fougeres in Britanny. On his return he attacked the prelate when about to take poſſeſſion of the archbiſhopric of Rouen, upon the tranſlation of Harlay, archbiſhop of that ſee, to the ſee of Paris. The proceſs againſt his dioceſan was referred, by the king's council, to the eccleſiaſtical judges, before whom it lay many years. In 1682 he oppoſed the election of Harlay, archbiſhop of Paris, to the office of preſident in the aſſembly of the clergy, under the plea that he had not yet cleared himſelf from the ſuſpicion of hereſy, and was, of courſe, ineligible by the canons. In the following year M. le Noir was arreſted and committed priſoner to the Baſtile, where a proceſs was carried on againſt him, before ſpecial commiſſaries, who pronounced him guilty of publiſhing defamatory writings, and adjudged him to make the *amende honorable* before the metropolitan church of Paris, and then to be ſent to the galleys for life. The firſt part of the ſentence was executed upon him, but the puniſhment of the galleys was exchanged for impriſonment. He was confined firſt at St. Malo's; afterwards in the citadel of Breſt; and laſtly at Nantes, where he died in 1692. He was author of ſeveral works; of which may be noticed "A Collection of Requeſts, or Caſes, &c." in folio, relative to the treatment of the Janſeniſts, which work is ſaid to diſplay a paſſionate eloquence, with a profound and very uncommon knowledge of law, and will be found uſeful by the eccleſiaſtical hiſtorian: "The indiſputable advantages of the church over the Calviniſts, in the controverſy between M. Arnauld and the miniſter Claude:" "The new political Light, or the new Goſpel of cardinal Palavicini, revealed by himſelf in the hiſtory of the council of Trent," which occaſioned the ſuppreſſion of a French tranſlation of that hiſtory which was about to be publiſhed. Moreri.

Noir, *Cape*, in *Geography*, a cape on the S.W. coaſt of the iſland of Terra del Fuego, at the entrance of the ſtraits of Magellan. S. lat. 54° 30'. W. long. 73° 33'.—Alſo, a cape on the northern ſide of Chaleur bay, about ſeven leagues W.N.W. of Bonaventure.—Alſo, a cape on the S. coaſt of the iſland of Milo. N. lat. 36° 47'. E. long. 24° 22'.

Noir, Fr., *black*, a note of muſic, *note noir*, a crotchet  , or half a minim; *noirs à queue*, a quaver  . In the old Fr. muſic there were ſeveral kinds of black notes, black with a tail, black ſquare, black lozenge. The two laſt have remained in plain chant; but in ſecular muſic nothing but the crotchet and its diviſions remain black. The note with a black head, ſtraight, and a tail, which we call a crotchet, the French call a *noir*, and the quaver with a hook to the tail, which the French, with more propriety, call a *croche*, or hook.

NOIRA, in *Ornithology*. See Psittacus *Garrulus*.

NOIR-AURORA, in *Ornithology*. See Muscicapa *Ruticilla*.

NOIR-ETABLE, in *Geography*, a town of France, in the department of the Loire, and chief place of a canton, in the diſtrict of Montbriſon; 18 miles S.S.W. of Roanne. The place contains 1887, and the canton 6990 inhabitants, on a territory of 202½ kiliometres, in 10 communes.

NOIRMOUNT Point, a cape at the entrance of St. Aubin's bay, on the S. coaſt of the iſland of Jerſey.

NOIRMOUTIER, an iſland of France, in the department of the Vendée, and chief place of a canton, in the diſtrict of Les Sables-d'-Olonne, ſeparated from the continent of France by a ſtrait three leagues long, and from about a quarter to one league wide. The canton contains 5420 inhabitants, on a territory of 67½ kiliometres, in one commune. N. lat. 46° 58'. W. long. 2° 9'.

NOIR-SOUCI, in *Ornithology*. See Loxia *Bonnarienſis*.

NOIX, Isleau, or Nut *Iſland*, in *Geography*, a ſmall iſland near the N. extremity of lake Champlain.

NOKA, a town of Hindooſtan, in Bahar; 14 miles N.N.E. of Saſeram.

NOKISSIMA, or *Burning Iſland*, a ſmall Japaneſe iſland. N. lat. 34° 15'. E. long. 139° 20'.

NOKRE-KOH, a mountain of Grand Bucharia, ſo called from its ſilver mines; 100 miles E. of Balk.

NOKSELA, a town of Bengal; 45 miles N.E. of Nattore.

NOLA, a town of Naples, in the province of Lavora, which, as ſome ſay, owed its origin to the Greeks of Chalcis; but, according to others, it was founded by the Etruſcans, forty years before the building of Rome. The Romans took it during the Samnite war. It afterwards became a Roman colony, and Veſpaſian gave it the name of Auguſtus. Near this town Hannibal was twice defeated by the Roman arms under Marcellus. This town, which was anciently rich and flouriſhing, is ſtill a handſome town, the ſee of a biſhop, ſuffragan of Naples. The ſilk ſpun in the neighbourhood is much eſteemed; 13 miles E. of Naples. N. lat. 40° 53'. E. long. 14° 20'.

NOLACHUCKY, a river of America, in the E. part of the ſtate of Tenneſſee, which runs W.S.W. into French Broad river, about 26 miles from Holſton river.

NOLANA, in *Botany*, a Linnæan genus, named from the bell-ſhaped form of its corolla, and derived from *Nola*, a little bell. Linn. Gen. 79. Schreb. 104. Willd. Sp. Pl. v. 1. 794. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 304. Juſſ. 132. Lamarck Illuſtr. t. 97. Gærtn. t. 132.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Aſperifoliæ* or *Luridæ*, Linn. *Borragineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, turbinate at the baſe, five-ſided, divided into five, heart-ſhaped, acute,

permanent ſegments. *Cor.* of one petal, bell-ſhaped, plaited, ſpreading, ſomewhat five-lobed, twice as large as the calyx. *Stam.* Filaments five, awl-ſhaped, erect, equal, ſhorter than the corolla; anthers arrow-ſhaped. *Piſt.* Germens five, ſuperior, roundiſh; ſtyle between the germens, cylindrical, ſtraight, the length of the ſtamens; ſtigma capitate. *Peric.* Drupas five, depreſſed, ovate. *Seed.* Nut the ſhape of the drupa, with three or four cells. Kernels ſolitary, roundiſh, finely dotted.

Eſſ. Ch. Corolla bell-ſhaped. Style between the germens. Drupas five. Nut three or four-celled.

1. N. *proſtrata.* Trailing Nolana. Linn. Sp. Pl. 202. Linn. fil. Dec. 1. 3. t. 2. Sims in Bot. Mag. t. 731. (Teganium procumbens; Schmid. Ic. 67. t. 18.)—Native of Peru. It was cultivated in 1761, by Mr. Philip Miller, and flowers from July to September. *Root* annual, ſimple, thread-ſhaped, often three feet long, black. *Stems* a foot long, herbaceous, proſtrate, branched, roundiſh, very ſmooth, with white and purpliſh dots. *Leaves* in alternate pairs, ſtalked, ovate, rhomboidal, entire, ſomewhat fleſhy, ſmooth, flat, veined, unequal in ſize. *Flowers* ſolitary, on long, hairy ſtalks, of a pale blue colour, beautifully ſtreaked from the centre with veins of dark purple, and ſhaped much like thoſe of *Convolvulus tricolor.*

There appears to be ſome ambiguity reſpecting the natural order to which *Nolana* ſhould be referred. Linnæus was not ſatisfied with having placed it among his *Aſperifoliæ.* Juſſieu hints that it has the habit both of *Convolvuli* and *Solaneæ*, whilſt Gærtner is of opinion that it ſhould be referred to the latter order.

Nolana, in *Gardening*, comprehends a plant of the herbaceous trailing annual kind, of which the ſpecies cultivated is the trailing nolana, (N. proſtrata.)

*Method of Culture.*—The plants in this ſpecies may be raiſed by ſowing the ſeeds on a hot-bed in March. When they are fit to remove, they ſhould be planted out ſingly into ſmall pots filled with light earth, plunging them into a freſh hot-bed to bring them forward. When their flowers open in the ſummer, as July, they ſhould have a large ſhare of air admitted when the weather is warm, to prevent their falling away without produeing ſeeds. Under this management the plants often continue flowering till the early froſts deſtroy them, and ripe ſeeds are produced in the beginning of the autumnal ſeaſon.

They afford variety among other tender annuals.

NOLAY, in *Geography*, a town of France, in the department of the Cote-d'-Or, and chief place of a canton, in the diſtrict of Beaume; 10 miles S.W. of it. The place contains 2039, and the canton 10,871 inhabitants, on a territory of 175 kiliometres, in 19 communes.

NOLDIUS, Christian, in *Biography*, a learned Daniſh divine, was born at Hoybia, in Scania, in the year 1626. He obtained the early part of his education at Lunden; whence he was removed, in 1644, to the univerſity of Copenhagen. Here he diſtinguiſhed himſelf by the great progreſs which he made in his ſtudies, and was enrolled among the citizens of the metropolis. In 1650 he was nominated rector of the college at Landſcroen; and in the following year took his degree of M.A. In 1654 he ſet out on his travels into foreign countries, viſited all the celebrated univerſities of Germany, and obtained introductions to many of the moſt eminent divines and other literary characters in that country, and afterwards to thoſe of Holland, England, and France. After this he returned to his native country for a ſhort time, and then ſet out for Holland a ſecond time, and purſued his ſtudies nearly three years in the univerſities of Franeker and Leyden. In 1660 he undertook the office of tutor and governor of the ſons of the lord of Gerſtorff, grand maſter of the palace to the king of Denmark, and in a few years was ordained miniſter and elected profeſſor of divinity in the univerſity of Copenhagen. To this poſt the king was pleaſed to add the honourable one of rector of that ſeminary. Noldius died in 1683, at the age of fifty-ſeven. He is known as an author, by "Concordantiæ particularum Hebræo Chaldaicum," &c. of which the beſt edition is that of Jena in 1734, 4to: "Sacrarum Hiſtoriarum et Antiquitatum Synopſis:" "Hiſtoria Idumæa, ſeu, de Vita et Geſtis Herodum Diatrive:" "Logica," and an edition of Joſephus's Hiſtory. Moreri.

NOLI, in *Geography*, a ſea-port town of the Ligurian republic, the harbour of which is defended by a fort, inhabited chiefly by fiſhermen, the ſee of a biſhop; 25 miles S.W. of Genoa. N. lat. 44° 11′. E. long. 8° 28′.

NOLI ME TANGERE, in *Botany*, &c. See Impatiens.

Noli me tangere, in *Surgery*. This curious name is applied to a ſpecies of herpes, which is frequently ſeen making its attack on the ſkin of the noſe. The diſeaſe conſiſts of ſmall ſuperficial ulcerations, which uſually commence on the alæ of the part, and are more or leſs concealed beneath furfuraceous ſcabs. The complaint is connected with ſpecific morbid action in the part affected, and the matter ſecreted ſeems to have the power of infecting the adjoining ſkin to which it is applied. Hence the noli me tangere often proves exceedingly obſtinate, ſpreading on one ſide, healing on another, and then breaking out again in places, where, at one time, the complaint ſeemed to have entirely ceaſed.

The writer of this article has repeatedly ſeen nearly the whole noſe gradually deſtroyed by this frequently intractable malady. He has ſeveral times ſeen the morbid proceſs ſuſpended for ſix months, or even a year, and then renew its ravages with increaſed vehemenee.

Such authors as have attempted to explain the cauſes of this ſpecies of herpes, have only diſplayed their own credulity, without throwing the leaſt light upon the ſubject.

The ulcerations of noli me tangere do not generally extend to the parts far within the noſtrils; but, ſome time ago, there was, under Mr. Harvey, in St. Bartholomew's hoſpital, a curious example, in which the greateſt part of the noſe was deſtroyed, and the uleeration proeeeded even through the front part of the palate into the mouth. The morbid proceſs ſometimes ſtops for a conſiderable time, and then is renewed with increaſed violenee. The following caſe illuſtrates the nature of noli me tangere, and one mode of treatment to which it yielded: Jane Chatillon, forty-five years of age, was attacked, in the courſe of September, 1788, with an inflammation on the left ala of the noſe. Some time afterwards the part ulcerated, which occaſioned a troubleſome and ſometimes a painful itching: different means were unſucceſsfully employed, and the caſe remained nearly in the ſame ſituation till the month of September in the following year. At this period the ulcer ſpread very faſt; the ſeptum naſi, the muſcles, and cartilages of both ſides, were, in a ſhort ſpace of time, deſtroyed. The ulceration extended on the left ſide, on the looſe edge of the upper-lip. This was the ſtate of her caſe on her admiſſion into the hoſpital of St. Louis, in the month of October, 1789.

A poultice, moiſtened with aq. veg. was applied twice a day to the uleer; a ſudorific ptiſan preſcribed, and a pill, compoſed of one grain of calomel, and one grain of ſulph. aurat. antimonii, ordered to be taken every day. From the fifth day, the inflammation leſſened. No other ſenſible alteration

alteration took place till the 21ſt. The ſuppuration, that, till this time, had been black and putrid, now became white and inodorous.

On the 37th, the diſcharge was trifling, and the ulcer, being well deterged, was dreſſed with pledgets, dipped in a ſolution of verdigris and corroſive ſublimate, in the proportion of ſix grains of each to a pint of water. On the 40th day, cicatrization began to take place, and was finiſhed by the 60th.

Some time before it was completely cicatrized, an iſſue was made in the arm, which was healed up, without any inconvenience to the patient, ſix months after the cure. Pariſian Chirurgical Journal, vol. i.

One of the beſt external applications to noli me tangere is the following lotion: ℞. Kali arſenicati gr. iv. Aq. menthæ ſativæ ℥iv. Spiritûs vini tenuioris ℥j. Miſce et cola. We have ſeen ſeveral caſes in St. Bartholomew's hoſpital, very lately, which were either cured or ſeemed diſpoſed to get well with this application. The ſolution of arſenic, which Mr. Home has always uſed, is made by boiling white arſenic in water for ſeveral hours, in a ſand-heat. When given internally, the doſe is from three to ten drops; when for external application, a dram is to be diluted with ℥ij of water; and this ſolution is gradually made ſtronger, as the parts become accuſtomed to it, till it is of double ſtrength. However, this mode of uſing arſenic is by no means a well regulated one; and Plunket's cauſtic, (ſee Arsenic,) for outward employment, is not nearly ſo neat an application as the above-mentioned lotion. At St. Bartholomew's hoſpital, arſenic is adminiſtered internally in the following formula: ℞. Kali arſenicati gr. ij. Aquæ menthæ ſativæ ℥iv. Spiritûs vin. ten. ℥j. Miſce et cola. Doſis ℥ij ter quotidie. In this way, the quantity of arſenic is nicely determined. We ſhall only juſt add, with regard to this medicine, that, both as an external application and an inward remedy, in caſes of noli me tangere, it perhaps deſerves the higheſt rank. One ſcruple of the argentum nitratum, diſſolved in half an ounce of diſtilled water, makes a very good application, which, although generally inferior, in point of efficacy, to arſenical ones, in the preſent diſeaſe occaſionally does good, when nothing elſe ſeems to produce any benefit. The caſe above makes us acquainted with another lotion, which deſerves further trial. All fluid remedies muſt be applied to the part, by dipping little bits of lint in them, placing theſe on the ulcerations, and covering the whole with a pledget.

The ointments, which ſeem moſt likely to prove uſeful applications to noli me tangere, are the unguentum hydrargyri nitrati, the unguentum picis, and unguentum ſulphuris. As far as our experience extends, they are generally leſs efficacious than lotions in the preſent caſes; but, in particular inſtances, they prove ſuperiorly uſeful, and, it deſerves particular notice, that ſurgeons can often make no progreſs againſt this inveterate diſeaſe, unleſs they apply a different ſort of dreſſing every day; ſometimes a lotion; at other times an ointment. The little ulcers may occaſionally be touched with the argentum nitratum. The ſmall furfuraceous ſcabs, which are continually forming on the part affected, ſhould be ſoftened with a little of the unguentum ſpermatis ceti, and removed with as much tenderneſs as poſſible.

We have already remarked, that arſenic is a good internal medicine, and the beſt mode of exhibiting it is already explained. Another medicine, which is often uſeful in theſe caſes, is what is known by the name of Plummer's pill, or the compound calomel pill. ℞. Calomelanos, ſulphuris antimonii præcipitati, ſingulorum gr. xii. Guaiaci gummi reſinæ gr. xxiv. Saponis quod ſatis ſit. Miſce fiant pilulæ duodecim. Doſis una bis quotidie. In other inſtances, we may try the decoctum ulmi, or ſarſaparilla, with one of the following pills thrice a day. ℞. Calomelanos gr. vj. Extracti conii 3j. Miſce fiant pilulæ duodecim. The hydrargyrus ſulphuratus has alſo been recommended as an alterative remedy in caſes of noli me tangere. Cooper's Firſt Lines of the Practice of Surgery, edit. 3. and Dictionary of Surgery, edit. 2. Default's Pariſian Chirurgical Journal, vol. i. &c.

NOLIN Creek, in *Geography*, a branch of Green river, in Kentucky.

NOLINA, in *Botany*, ſo named by Michaux, in compliment to "P. C. Nolin, a Frenchman, an ardent cultivator of American plants more eſpecially, to the great benefit of botany as well as agriculture." Mich. Boreal-Amer. v. 1. 207.—Claſs and order, *Hexandria Trigynia*. Nat. Ord. *Coronariæ*, Linn. *Junci*, Juſſ.?

Gen. Ch. *Cal.* none. *Corolla* of one petal, in ſix deep, ſpreading, nearly equal, oval ſegments. *Stam.* Filaments ſix, awl-ſhaped, ſhorter than the corolla; anthers oblong, ſomewhat heart-ſhaped, ſlightly notched at the top. *Piſt.* Germen ſuperior, triangular; ſtyle very ſhort; ſtigmas three, obtuſe, recurved. *Peric.* Capſule roundiſh, with three angles, membranous, of three cells, the partitions from the inflexed margins of the valves. *Seeds* ſolitary, obovate, ſmaller than the cell and attached to its baſe, ſeldom more than one perfected in each capſule.

1. N. *georgiana*.—Native of Georgia in North America. *Bulb* tunicated, perennial. *Leaves* ſeveral, radical, ſpreading in every direction, from five to nine inches long, a line broad, graſſy, thick and rigid, rough at the edges. *Stalk* clothed below with a few ſcattered awl-ſhaped leaves, two feet high or more, diſtantly and looſely branched above; its branches racemoſe; flower-ſtalks aggregate. *Flowers* minute, whitiſh.

Such is nearly the account of Michaux, who conſiders this genus as allied to *Helonias* on one hand, and to *Phalangium* of Juſſieu (*Anthericum* of Linnæus) on the other. He places it in the order *Trigynia*, but deſcribes the ſtyle as ſimple, though the ſtigmas are three. We have preſumed to term *corolla*, after Linnæus, what he calls *calyx petaloideus*.

NOLINSK, in *Geography*, a town of Ruſſia, in the government of Viatka; 40 miles S. of Viatka. N. lat. 57° 44′. E. long. 50° 14′.

NOLLE, a town of France, in the department of the Po; 8 miles N. of Turin.

Nolle *Proſequi*, is uſed in *Law*, where a plaintiff in any action will proceed no farther, and may be before or after a verdict, though it is uſually before; and it is then ſtronger againſt the plaintiff than a nonſuit, which is only a default in appearance; but this is a voluntary acknowledgment that he hath no cauſe of action.

NOLLET, John Anthony, in *Biography*, who flouriſhed in France in the laſt century, was born at Pimprè, in the dioceſe of Noyon, in the year 1700. He was educated at the college of Clermont in the Beauvoiſin, and afterwards went to Beauvais, where he laid ſuch a foundation in claſſical learning that his parents were encouraged to ſend him to Paris, to go through a courſe of philoſophy at the univerſity. Their wiſh was, that he ſhould embrace the eccleſiaſtical profeſſion, and he readily acceded to it. From a very early age he had ſhewn a taſte for the purſuits of natural ſcience, in which he afterwards ſo highly diſtinguiſhed himſelf: for the preſent, however, he checked his ruling paſſion, as being likely to interfere with the ſtudies more appropriate to his deſtined

deſtined character, and gave himſelf up entirely to the ſtudy of ſcholaſtic theology. In 1728 he was admitted to deacon's orders, and ſoon became a licenſed preacher. He had not followed this profeſſion very long before he felt an inclination for the ſciences, which was, in a ſhort time, irreſiſtible, and he now devoted his fine talents almoſt wholly to the ſtudy of natural philoſophy. He became known and attached to M. du Fay and Reaumur, and with their aſſiſtance he made a rapid progreſs in thoſe branches of knowledge for which theſe philoſophers were diſtinguiſhed. By the former he was received as an aſſociate in his electrical reſearches, and the latter reſigned to him his laboratory. In 1734 he accompanied his friends du Fay, du Hamel, and de Juſſieu on a viſit to England, where he was admitted a foreign member of the Royal Society. Two years afterwards he made a tour into Holland, where he formed an intimate connection with s'Graveſande and Muſſchenbroek. Upon his return to Paris he reſumed a courſe of experimental philoſophy, which he commenced in 1735, and which he continued during the long ſpace of 25 years. The courſes delivered by Nollet gave riſe to the adoption of ſimilar plans in other branches of ſcience, ſuch as chemiſtry, anatomy, natural hiſtory, &c. In 1738 a public profeſſorſhip of experimental philoſophy was eſtabliſhed at Paris under the patronage of cardinal Fleury, and the abbè Nollet was the firſt perſon who received that appointment. During the following year, the Royal Academy of Sciences appointed him adjunct mechanician to that body, and in 1742 he was admitted an aſſociate. In 1739, the king of Sardinia being deſirous of eſtabliſhing a profeſſorſhip of phyſics at Turin, invited the abbè Nollet to perform a courſe of experimental philoſophy before the royal family, with which he complied. From Turin he made a tour in Italy, where he made many obſervations, and collected ſome excellent facts reſpecting the natural hiſtory of the country. In the year 1744 he was called to Verſailles to give lectures to the dauphin in natural philoſophy, at which the king and royal family were frequently preſent. In the year 1749, the abbè Nollet took a ſecond journey into Italy, whence many wonderful accounts had been circulated throughout Europe, of the communication of the medicinal virtues by electricity, which ſeemed, at that time, to be ſupported by numerous well atteſted facts. To examine into theſe electrical miracles, as they were then thought, and to be aſſured of their truth or fallacy, was a grand motive with our author in paſſing the Alps at this time, and in viſiting the philoſophers who had publiſhed accounts of thoſe experiments. But though he engaged them to repeat their experiments in his preſence, and upon himſelf, he was ſoon convinced that the pretended facts were deceptions or great exaggerations, and that no method had been diſcovered, by means of which the power of medicine could by electricity be made to inſinuate itſelf into the human body. The abbè did not confine his enquiries to theſe facts only, but extended them alſo to all the branches of natural philoſophy, the arts and agriculture. After his return to France, the king, in 1753, eſtabliſhed a profeſſorſhip of experimental philoſophy at the college of Navarre, and nominated the abbè Nollet to fill that poſt. In the year 1757 the king beſtowed upon him the *brevet* of maſter of natural philoſophy and natural hiſtory to the younger branches of the royal family of France, and in the ſame year appointed him profeſſor of natural philoſophy to the ſchools of artillery and engineers. Soon after this laſt inſtance of preferment he was received a penſionary of the Royal Academy of Sciences. This celebrated naturaliſt and experimental philoſopher died in 1770, deeply regretted by that part of the public, of all countries, who were capable of appreciating his worth, as well as by the numerous friends whoſe attachment he had ſecured by the amiableneſs of his manners and the goodneſs of his heart. Independently of a vaſt number of papers publiſhed by the abbè in the different volumes of the "Memoires" of the Academy of Sciences, from the year 1740 to 1767, he was author of "Récherches ſur les Cauſes particulières des Phenomenès electriques," 1749, 12mo; "Lettres ſur l'Electricitè," 3 tom. 12mo, 1749, 1760, 1767; "Leçons de Phyſique," 6 tom. 12mo, 1764; "Eſſai ſur l'Electricitè des Corps;" "L'Andes experiences," 3 tom. See Prieſtley's Hiſt. of Electricity, 4to. p. 100 and other parts; alſo Cavallo's Complete Treatiſe on Electricity, in three vols. Likewiſe the articles ELECTRICITY, and others relating to the ſame ſubject in vol. xii. of the New Cyclopædia. Alſo CIRCUIT, LEYDEN *Phial*, &c.

NOLLIN, DENNIS, a French biblical critic, who flouriſhed in the early part of the laſt century, was educated to the bar, and acquired reputation in the character of an advocate of the parliament of Paris. Being, however, attached to theological ſtudies, he directed his whole attention to the holy ſcriptures, and quitted his legal profeſſion. He was a moſt diligent collector of whatever might tend to elucidate the writings of the prophets, apoſtles, &c. and his library is ſaid to have contained a greater number of editions of the bible, of tranſlations, and of commentaries on the ſcriptures, than had ever before belonged to any individual. This library, at his death, which happened in 1710, he directed to be ſold for the benefit of the poor of his pariſh. He publiſhed "A Letter from N. Indes, divine of Salamanca, propoſing a Method for correcting the Greek Septuagint Verſion, with an illuſtration of ſome difficult paſſages," which excited a controverſy between the author and father de Tournemine. He was author alſo of "A Letter to M. l'Abbè B. relative to the new edition of the Septuagint by John Erneſt Grabe," inſerted in the "Supplement du Journal de Sçavans" for December 1710: "Two Diſſertations, one on the French Bibles to the year 1541, and the other illuſtrative of a literary Phenomenon:" and "A Critical Letter on an anonymous Diſſertation, and the Letters of M. Richard Simon, reſpecting the Antiquities of the Chaldeans and Egyptians," 1710. Moreri.

NOLSOE, in *Geography*, one of the ſmaller Faroer iſlands; ſix miles S. of Oſteroe. N. lat. 65° 10'. W. long. 6° 38'.

NOM DE JESUS, a town of the iſland of Zebu, one of the Philippine iſlands, the ſee of a biſhop, ſuffragan of Manilla.

NOMA, NOME, (from νεμω, *to eat away*,) in *Surgery*, a phagedenic ulcer, or a ſpecies of herpes.

NOMADES, Νομαδες, from νεμω, *I feed*, a name given, in *Antiquity*, to ſeveral nations, or people, whoſe whole occupation was to feed and tend their flocks; and who had no fixed place of abode, but were conſtantly ſhifting according to the conveniences of paſturage.

The moſt celebrated among the Nomades were thoſe of Africa, who inhabited between Africa, properly ſo called, to the eaſt, and Mauritania to the weſt. They are alſo called *Numidæ*, or *Numidians*. Salluſt ſays, they were a colony of Perſians, brought into Africa with Hercules. The Nomades of Aſia inhabited the coaſts of the Caſpian ſea.

The Nomades of Arabia, according to Pliny (l. vi. c. 28.), occupied a territory eaſt of the deſerts of Palmyra, and extended from the ſouthern coaſt as far as the Aſphaltite lake; next to them were the Attali, who were accuſtomed to make incurſions on the country of the Chaldæans, in the vicinity of the Euphrates. The Arabian Nomades, and the Attali, were

were bounded ſouthward by the Scenites, who, according to Euſtathius (in Dionyſ. p. 121.) inhabited the diſtrict between Cœleſyria and the Euphrates. Strabo (l. xvi.) places theſe people in the ſame ſituation with Pliny.

The Nomades of Scythia were the inhabitants of Little Tartary; who ſtill retain the ancient manner of living. The Scythian Nomades, according to Pliny (l. iv. c. 12.), inhabited the country on the left ſide of the Caſpian ſea; and they were ſeparated from the Georgii by the river Panticapes. Strabo ſays, that they lived in waggons inſtead of houſes.

NOMAES, or Nomao, in *Geography*, a town of Portugal, in the province of Beira; ſix miles S.E. of St. Joao de Peſqueira.

NO MAN'S Land, a ſmall iſland near the American coaſt, S.W. of Martha's Vineyard, about three miles long, and two broad; belonging to Duke's county, Maſſachuſetts. N. lat. 41° 15'. W. long. 71° 5'.

No man's *Land*, in *Sea Language*, is a ſpace between the after-part and belfrey, and the fore-part of a ſhip's-boat, when the ſaid boat is ſtowed upon the booms, as in a deep waiſted veſſel. Theſe booms are laid from the forecaſtle nearly to the quarter-deck, where their after-ends are uſually ſuſtained by a frame called the gallows, which conſiſts of two ſtrong poſts, about ſix feet high, with a croſs-piece, reaching from one to the other, athwart ſhips, and ſerving to ſupport the ends of thoſe booms, maſts, and yards, which lie in reſerve to ſupply the place of others carried away, &c. The ſpace called no man's land is uſed to contain any blocks, ropes, &c. which may be neceſſary on the forecaſtle. It probably derives this name from its ſituation, as being neither on the ſtarboard nor larboard ſide of the ſhip, nor on the waiſte or forecaſtle; but being ſituated in the middle, partakes equally of all thoſe places. Falconer.

NOMANCY, compounded of *nomen*, *name*, and μαντεια, *divination*, a name given to the art of divining the fates of perſons by means of the letters that form their names. Nomany, or, as it ſhould rather be called, *nominomancy*, or *onomatomancy*, ſeems to be nothing elſe but the cabbaliſtic gematria.

NOMARCHA, in *Antiquity*, the governor or commander of a nome, or nomos.

Egypt was anciently divided into ſeveral regions, or quarters, called *nomes*, from the Greek νομος, taken in the ſenſe of a diviſion; and the officer who had the adminiſtration of each nome, or nomos, from the king, was called *nomarcha*, from νομος, and αρχη, *command*.

NOMBRE de Dios, in *Geography*, a port town of South America, in the province of Darien, at the bottom of a bay of the ſame name; deſtroyed ſoon after it was founded by the Indians of Darien, afterwards rebuilt, and occupied by its inhabitants until the year 1584, when Philip II. ordered them to be removed to Porto Bello, as a place better adapted to the commerce of the country; 30 miles E. of Porto Bello. N. lat. 9° 36'. W. long. 79° 35'.—Alſo, a large and populous town of Mexico, on the W. coaſt, near the Pacific ocean, in the province of Zacatecas. It became populous in conſequence of the acceſſion of inhabitants, on account of its ſilver mines; 85 miles N.W. of Zacatecas. N. lat. 24° 6'. W. long. 104° 32'.—Alſo, a river of Peru, called "Tambopalla," which runs into the Pacific ocean, S. lat. 17° 10'.

Nombre *de Jeſus*, a town of South America, in the province of Quito; 35 miles N.W. of St. Joſef de Huates.

Nombre *de Maria*, a town of South America, in the province of Quito; eight miles N.E. of St. Joſef de Huates.

Nombre *de Hios*, a town of Mexico, in the province of New Biſcay; 120 miles N. of Parral.

NOMBRIL Point, in *Heraldry*, is the next below the feſs-point; or the very centre of the eſcutcheon.

Suppoſing the eſcutcheon divided into two equal parts below the feſs; the firſt of theſe diviſions is the nombril; and the lower the baſe.

NOME, or Name, in *Algebra*, denotes any quantity with a ſign prefixed, or added to it, whereby it is connected with ſome other quantity; upon which the whole becomes a binomial, trinomial, or the like.

Thus $a + b$ is a binomial, whoſe names, or nomes, are $a$ and $b$, and $a + b + c$ a trinomial, whoſe names are $a$, $b$, and $c$, &c.

Nome, among the ancient Egyptians, a diviſion, or province, into which the whole kingdom is divided. The origin of the nomes, according to Diodorus Siculus, was this: the inhabitants being refractory, and much inclined to inſurrections, in order to prevent theſe, the kings divided the whole country into different provinces, or nomes, and eſtabliſhed the worſhip of ſome particular animal in each of them, prohibiting, at the ſame time, ſuch animal to be eaten within the bounds where it was worſhipped. Hence, as every province was intoxicated with its own particular form, and object of worſhip, it entertained the higheſt contempt for that of its neighbours, and took a pleaſure in profaning the animal, which among them had divine honours paid it. This religious oppoſition had the deſired effect; for all mutual confidence being thereby cut off, there were no more inſurrections againſt the government. Mem. Acad. Inſcrip. vol. xiii. p. 52.

Nome, in the *Ancient Greek Muſic*. Every melody determined by inviolable rules, was called by the Greeks a *nome*, or a law. The nomes acquired their denomination, 1ſt, from certain people, as the Æolian nome, the Lydian nome; 2dly, by the kind of rhythm or meaſure, as the Orthian nome, the Dactylic nome, the Trochaic nome; 3dly, by the name of their inventors, as the Hieracian nome, the Polymneſtan nome; 4thly, from the ſubject, as Pythian nome, Comic nome; 5thly, and laſtly, from their mode; as the Hypotoide or grave nome, Netoide or acute, &c. There were likewiſe nomes of half one mode and half another: there were others that were tripartite, of which Sacadas, or Clonas, was the author; the Dorian, Phrygian, and Lydian. (See Song, and Mode.) The nomes and dithyrambics were equally hymns ſung in honour of the gods. The nomes were for Apollo, as the dithyrambics were for Bacchus. Now the literal meaning of νομος, *nome*, being a *law* or *rule*, it ſhould ſeem as if, after the invention of muſical characters, the nomes were the firſt melodies, or tunes, that were written down, and rendered permanent and unalterable; whereas, before that period, muſic muſt have been played extempore, or by memory: and as Terpander, the inventor of a muſical notation, is likewiſe ſaid to have ſet the νομοι, or *laws* of Lycurgus, to muſic, the conjecture has both a literal and a figurative foundation. Ariſtotle, (Prob. xvii. 28.) aſks why ſuch different things as *laws* and *ſongs* had the ſame appellations? and anſwers the queſtion himſelf, by ſaying, that before the knowledge of letters, *laws* were *ſung*, in order to their being the better retained in memory. If, according to Joſephus, the word νομος is not to be found in all the writings of Homer, it muſt, conſequently, be a more modern term. The word, however, *does* occur in Homer's Hymn to Apollo, v. 20, though not in the Iliad or Odyſſey.

NOMEN. See Prænomen, Name, and Agnomen.

NOMENCLATOR, or Nomenculator, among the Romans,

Romans, was uſually a ſlave, who attended perſons that ſtood candidates for offices, and prompted or ſuggeſted to them the names of all the citizens they met, that they might court them, and call them by their names: which among that people was the higheſt piece of civility.

NOMENCLATOR *of the Romiſh Church*, was an officer, whoſe buſineſs it was to call the perſons whom the pope invited to dinner.

He alſo liſtened to thoſe who were admitted to audience, in the ſame manner as thoſe now retained by the cardinals, called *auditors*.

NOMENCLATORES, among the *Botanical Authors*, are thoſe who have employed their labours about ſettling and adjuſting the right names, ſynonyms, and etymologies of names, in regard to the whole vegetable world.

NOMENCLATURE, NOMENCLATURA, a catalogue of ſeveral of the more uſual words in any language, with their ſignifications; compiled in order to facilitate the uſe and retaining of ſuch words to thoſe who are to learn the tongue.

We have Latin, Greek, French, &c. nomenclatures.

NOMENCLATURE, in *Botany*, which in its origin muſt have been entirely caſual, and which, long after the ſcience had made great progreſs, received no particular cultivation, was firſt reduced to fixed principles by Linnæus. He had this ſubject ſo much at heart, that he not only devoted to it 115 aphoriſms, out of the 365 which compoſe his *Fundamenta Botanica;* and commented upon them, in common with the reſt, in his *Philoſophia;* but he publiſhed a much more ample elucidation of them, in an octavo volume, entitled *Critica Botanica*. This work, being very rare in England, has not here received the attention it deſerves. Its object was, in the firſt place, to promote uniformity and ſimplicity in the nomenclature already eſtabliſhed; and in the next to provide judicious regulations, for the contrivance and application of names for new diſcoveries. The author juſtly celebrates the uſeful labours of Caſpar Bauhin, whoſe *Pinax* is a complete, if not a perfectly correct, ſyſtem of nomenclature and ſynonyms, up to the time in which it was written. He goes on to lament thoſe diſſentions which took place under the Triumvirate, as he happily calls it, of Ray, Tournefort and Rivinus, when each of thoſe great men, the leader of a ſect and author of a ſyſtem, adopted or contrived names at pleaſure, without the ſmalleſt mutual conſent or conſideration. Victory indeed remained with Tournefort, in conſequence of his ſucceſsful labours in eſtabliſhing the genera of plants, and no laurels were ever more juſtly won. His merits in this department, gave ſome popularity even to his ſyſtem, with all its faults and inconveniences. His exertions made a ſtand, for a time, againſt the confuſion, which an inundation of new diſcoveries muſt otherwiſe have produced. Science had time to rally her forces under his banners, till they could be marſhalled with more preciſion, ſo as to be augmented from time to time, without endangering the ſafety of the republic, by producing anarchy inſtead of ſtrength.

Generic names being tolerably well fixed by Tournefort, Linnæus had little to do in that department, except to introduce a few improvements and corrections, which he thought requiſite. The great principle was eſtabliſhed, that each genus ſhould be characteriſed by the parts of fructification, and diſtinguiſhed by an appropriate and fixed name. The old names, whoſe origin or meaning was loſt in the darkneſs of antiquity, were applied with as much preciſion as they could. Nobody diſputed about what ſhould be called *Quercus* or *Roſa*, nor were the faſtidious doubts of critics permitted to embroil *Vaccinium* and *Liguſtrum*, nor to hinder the progreſs of what they could not always advance. The ancient practice of dedicating certain plants to the honour of promoters of the ſcience, was confirmed and imitated. New appellations were neceſſarily contrived for new genera, in which regard was had, as much as poſſible, to their characters, uſes, or reſemblances; and Tournefort ſeldom omitted to explain the names he invented, or thoſe he adopted. Linnæus, in following his ſteps, introduced ſome reformations, chiefly as to the rejection of compound or comparative names, or of new names of barbarous origin. It is to be regretted, that he and his pupils in general, have uſually omitted to explain the meaning of the names they gave, in which there are often very fanciful and obſcure alluſions, not without frequent inaccuracies of conſtruction; ſo that we are ſometimes loſt in conjecture, in attempting to unravel the myſtery. The reader of the preſent work will find many inſtances of this in our botanical articles. He will alſo perceive, that though Linnæus might lay down excellent rules, he not unfrequently broke through them, ſometimes perhaps from negligence, ſometimes for the ſake of peace. This great man was not unfrequently thwarted, in the department of nomenclature more eſpecially, by perſons who thought they acquired a ſort of conſequence by differing from him, and who found it eaſier to do ſo by inventing new names, than by improving upon his characters or deſcriptions, or by adding any thing to his information.

The ſpecific names of plants were not ſo ſpeedily eſtabliſhed as the generic ones. Tournefort muſt yield the palm in this reſpect to Rivinus. The latter firſt attempted that brevity and uniformity in the nomenclature of ſpecies, which Linnæus afterwards adopted. Tournefort, as well as Ray, ſpoke of the ſpecies of plants, either in the phraſes of old botaniſts, or in ſimilar ones of their own contrivance, into which the utmoſt laxity of ideas was admitted. Hearſay appellations, random compariſons, or the native country of the plants, as frequently enter into ſuch phraſes, as their diſcriminative marks; nor are the latter, when they occur, choſen with an invariable regard to what is found or permanent. The length of theſe phraſes renders them in general impoſſible to be remembered, and the want of uniformity in their plan greatly impedes their utility. Aware of all theſe defects, Linnæus contrived, what he at firſt called ſpecific names, but which are in fact ſpecific characters. His intention was, that theſe ſhould ſupplant the above phraſes; with which view he made them as conciſe as poſſible, limiting them to twelve words, at the furtheſt, and moſt frequently compriſing each of them within a much ſmaller compaſs. Theſe definitions however were found impracticable, for the uſe of even the moſt learned and aſſiduous botaniſts, as names; though their perfection is the very *acme*, and, as experience proves, the moſt difficult part of botany, as far as regards the knowledge of plants. Something was ſtill wanting to enable botaniſts to converſe with facility, as well as to regiſter their own acquirements. Haller contrived to number all the ſpecies of his Helvetic Flora in a regular ſeries, and it is wonderful with what preciſion his pupils often recollect the appropriate number of each of his plants. This method however precludes the introduction of any new diſcoveries, and is liable to abundance of objections beſides. It is commodious to number the ſpecies of each particular genus by itſelf, but no perſon would ever think of uſing ſuch numbers as names.

At length Linnæus happily adopted the plan of Rivinus, of calling every plant by a ſingle ſpecific as well as a generic name. Thus he combined the advantages of all preceding modes. His definitions were a vaſt improvement upon

upon thoſe of his predeceſſors, and his ſpecific names, aſſociated therewith, made them current coin. Rivinus deſigned his names for ſpecific diſtinctions, for which their neceſſary brevity renders them totally inadequate. If they convey additional information, reſpecting circumſtances not ſo properly admiſſible into the ſcientific character, we cannot but eſteem them ſo much the better. It ſeems a ſtrange doctrine, which ſome writers have advanced, that names are the better for ſignifying nothing. Linnæus however was ſo much afraid of theſe ſpecific names ſupplanting the ſpecific definitions, or eſſential differences, that he cautiouſly denominated them trivial names, as deſigned merely for common uſe or convenience. Hence he frequently chooſes them from ſome obvious character, which may ſtrike a common obſerver ſooner than more important marks; and he has continual recourſe to the medical or economical appellations, or uſes, of plants for his ſpecific names. By this means the arts and ſciences go hand in hand. In other inſtances he promotes a knowledge of the hiſtory of botany, and aſſociates the ancient writers with the modern, by retaining ſome celebrated ſynonym, or ſome alluſive word, for the name of a long-known ſpecies. Whether we allow Rivinus or Linnæus the merit of inventing theſe ſhort ſpecific names, there can be no doubt that their adoption has contributed, more than any other circumſtance, to the popularity, and practical facility, of the Linnæan ſyſtem. This is univerſally felt and acknowledged. Their application to Zoology has been equally beneficial, and ſome of the contrivances of the great Swediſh naturaliſt in the nomenclature of animals, particularly inſects, are amongſt the happieſt efforts of his genius. His friend and fellow-labourer in this particular department of natural hiſtory, the great Bergmann, ſeized the fortunate idea for his own uſe in chemiſtry, and contrived to expreſs in two words the eſſential characters, or chemical combinations, of the productions with which that ſcience is converſant. How wiſe and advantageous this invention has been, the moſt ſuperficial admirer, as well as the deepeſt philoſopher, is every moment conſcious.

In ſpeaking of botanical nomenclature, we ought not to omit mention of the moſt ſingular attempt of the kind, by Dr. de Wolf of Dantzic, who publiſhed, in 1776, an octavo volume, entitled *Genera Plantarum vocabulis characteriſticis definita*. His plan is, to adapt ſome particular letter to each character, ſo that the generic name of a plant ſhall be an aſſemblage of the letters that expreſs all its technical characters. The firſt ſyllable is to compriſe what regards the fruit; the following one or more the integuments of the flower. A conſonant before a vowel expreſſes ſubſtance, or figure, and ſituation; a vowel number and diviſion. Such names however are barely poſſible to be pronounced, and impoſſible to be remembered. We ſhall give one of his examples. B ſtands for a berry, æ for ſeveral ſeeds in two cells. A five-cleft ſtellated corolla is expreſſed by *l i*; a conical five-cleft calyx by *v i*. Hence is formed the word *Bælivi*, for *Solanum*. A ſtands for one piſtil; *a* for one ſtamen; *i* for five diſtinct ſtamens; ſo that *Aî* prefixed to *Bælivi*, expreſſes the order and claſs of the genus in queſtion. The names of genera nearly allied are, of courſe, the moſt ſimilar, but for that very reaſon the moſt hard to diſtinguiſh or remember. Thus Wŷſom is *Polianthes*, Wŷſor *Crinum*, Wŷſær *Pontedera*, Wŷpo *Hyacinthus*, Wŷhop *Cyanella*, &c. Wîvîi is *Dictamnus*, Wîiwi *Rhodora*, Wîvîra *Ledum*, Wîpîi *Pyrola*, Wîrîwi *Ruta* with a five-cleft flower, Wîlwîi *Swietenia*, Wîwîpi *Zygophyllum* with a five-cleft flower, Wrîwîi *Tribulus*, Wîîwi or Wôôwo, according as the flowers are five or ſix-cleft, *Cluſia*. Wąwąą is *Sempervivum*, Wąmîwi *Iſopyrum*, Wąmąwą *Trollius*, and Wąwîwi *Dillenia*. By theſe examples it will be perceived, that the author follows the artificial ſyſtem of arrangement, and that his names defy even the accentual powers of a Porſon. We cannot however deny him the praiſe of ingenuity and application. Let all who devote thoſe qualities to the purſuit of originality, at the expence of every other conſideration, come and lay their laurels at his feet. S.

Nomenclature, is a term employed to denote the language peculiar to any particular ſcience, or art.

It is to the modern nomenclature of *Chemiſtry*, ſo admirable both for its ingenuity and comprehenſiveneſs, that the rapid progreſs which has been made in this department of philoſophy, during the laſt five and twenty years, is, in a great meaſure, to be aſcribed. Nor need we be ſurpriſed at this, for, "as ideas are preſerved, and communicated by means of words, it neceſſarily follows, that we cannot improve the language of any ſcience, without at the ſame time improving the ſcience itſelf; neither can we, on the other hand, improve a ſcience, without improving the language, or nomenclature, which belongs to it. However certain the facts of any ſcience may be, and however juſt the ideas we may have formed of theſe facts, we can only communicate falſe or imperfect impreſſions of theſe ideas to others, while we want words by which they may be properly expreſſed." Such is the remark of the celebrated Lavoiſier, and in all the circumſtances attendant on the reform in the ſcience and language of chemiſtry, his reaſoning is moſt fully verified. The grand outline of the modern nomenclature was ſketched and delivered to the world by Fourcroy, Morveau, Berthollet, and himſelf. This took place in the year 1787, and the changes which have ſince been made have all been of that trifling nature, as to leave the baſis of the ſyſtem, founded by theſe philoſophers, entire and undiſturbed. Their firſt ſtep was to give to each of the ſubſtances ſuppoſed to be uncompounded, or elementary, ſimple and appropriate names. In moſt inſtances they adopted thoſe that had been long in uſe, it having been made a law by them, "ſcrupulouſly to preſerve the ancient names in all caſes wherein the ſubject, denominated and long known, preſented in its ancient denomination no one of the vices which they were deſirous of avoiding." But the diſcovery of the conſtituent parts of water, and of the atmoſphere, rendered the adoption of certain new titles neceſſary, and in conſtructing theſe, they were guided by ſome prominent peculiarity preſented by each of the elementary bodies. The two ingredients, for example, of which water is compoſed, received the appellations of *oxygen* and *hydrogen*; in conſequence of the former poſſeſſing the excluſive power of imparting *acidity* to certain of its combinations, and from the latter being the "generative principle" of *water*. The roots in thoſe caſes from which the derivation is effected, were the Greek words ὀξυς, *acidum*, and ὑδωρ, *aqua*, the verb γινομαι, *gignor*, being added to each. In all the additions which have been ſubſequently made to the elementary catalogue, the principle thus laid down has, either in letter or ſpirit, been uniformly acknowledged. It was not in every inſtance that the characteriſtic properties of the ſubſtance were ſufficiently ſtriking to enable the diſcoverer to derive the propoſed name from theſe; but in defect of ſuch aid, either the place where the compound affording the new body was found, has ſuggeſted the term, or ſome other circumſtance equally connected with its hiſtory. All names hereafter to be offered, which are perfectly arbitrary, ſhould be rejected; for as the leading diſtinction between the nomenclature of

the old and modern ſchool conſiſts in the latter conveying with the name a knowledge of the conſtitution of the compound deſignated, while the former was totally regardleſs of ſuch aſſiſtance, even the elementary bodies ſhould not receive their titles without ſome attention to the information which may be thus communicated. That much may be accompliſhed by a regard to this circumſtance, is evident from the names attached to the newly diſcovered baſes of the earths and alkalies; for who, at all acquainted with the principles upon which modern chemical language is conſtructed, could fail to recogniſe in the terms *barium* and *ſtrontium*, the baſes of *barytes* and *ſtrontian*, and in thoſe of *potaſſium* and *ſodium*, the baſes of the two fixed alkalies? The ſame may be ſaid of all the elementary bodies, which the brilliant diſcoveries of ſir Humphrey Davy, and his followers have, within theſe few years, introduced to us; and we cannot too highly applaud this diſtinguiſhed chemiſt for the earneſt regard he has ſhewn for ſo important an object, in every inſtance when the nomenclature has been extended by him. There is no circumſtance affecting the uniformity of a ſcientific language ſo apparently trifling as to deſerve to be diſregarded; and it is for this reaſon that the terminations, even of the names of the ſimple bodies, ſhould, as well as their derivation, be regulated by ſome eſtabliſhed rule. For the metals, the termination *um* has been choſen, and as there is nothing in the ſound offenſive to the genius of our language, it may very properly be adopted; eſpecially ſince the Latin names of all the older ones have this ending, from their belonging to a particular variety of nouns, of which that final ſyllable is characteriſtic. To extend this termination, however, to others of the ſimple bodies, ſeems, in ſome degree, objectionable; and inſtead of *murium* and *fluorium*, therefore, which have been choſen to repreſent the baſes of the *muriatic* and *fluoric* acids, we would recommend ſuch words as *muriogen* and *fluogen*, which are derivatives perfectly conſiſtent with the modern ſyſtem, and equally expreſſive of the character of their objects with the terms before mentioned. By perſiſting in this method, the mere ending of the word would immediately apprize us to what claſs of bodies any newly diſcovered ſubſtance might belong, or at all events, whether or not it was metallic; and this is entirely an advantage of ſufficient importance to deſerve attention. In naming the various *compounds* of chemiſtry, the projectors of the new nomenclature have invented a ſyſtem, not liable, like the elementary ſubſtances, to the caprice of a diſcoverer, but definite and invariable in its principles; and while it is capable of admitting any number of compounds that may be added, conveys immediately to the mind a knowledge of the conſtitution of the ſubſtance which it is employed to repreſent, without that effort of memory neceſſary for the interpretation of the language of the older chemiſts. The ſimpleſt form of combination is the union of the inflammable elements with each other. When theſe elements are metals, the combinations are termed *alloys*, except in thoſe caſes where mercury is employed, and the reſulting compound then is denominated an *amalgam*. For the other combinations of this claſs, where *one* of the bodies only is a metal, or has a metallic baſe, a different form of expreſſion is provided, the termination *uret* being given to the ſubſtance with which the metallic baſe is united. The combinations of ſulphur, for inſtance, are denominated *ſulphurets*; of phoſphorus, *phoſphurets*; of carbon, *carburets*; and of hydrogen, *hydrurets*. The union of ſulphur with iron, being a *ſulphuret of iron*, and, in like manner, of the reſt. The rule in this, and all other inſtances, is, that whichever of the ingredients is called the *baſe*, the name of that remains unchanged; and it is to this circumſtance that an apparent anomaly in the caſe of hydrogen, which is occaſionally found in both conditions, is to be aſcribed. Sulphur, phoſphorus, and carbon, never preſent themſelves in any mixture with the other ſimple inflammables, ſo that they do not impart to the reſulting compound the name either of a *ſulphuret*, a *phoſphuret*, or a *carburet*. They never act as *baſes* in this claſs of combinations. But otherwiſe is the caſe with hydrogen, which, in many inſtances, aſſumes the part of baſe, and, with each of the three inflammable elements laſt mentioned, forms aëriform compounds, ſtyled, agreeably to the above law, *ſulphuret of hydrogen*, *phoſphuret of hydrogen*, and *carburet of hydrogen*; but more commonly, though leſs properly, diſtinguiſhed by the titles of *ſulphuretted*, *phoſphuretted*, and *carburetted* hydrogen. Every compound which exiſts in a permanently aëriform ſtate, at all known temperatures, is called a *gas*: the ſubſtances juſt ſpoken of, therefore, are *gaſes*; and the adjectives *gaſeous* and *gaſiform* are alſo employed as expreſſive of the ſame ſtate. The next form of combination, of which it will be neceſſary to ſpeak, is the union of the inflammable elements with oxygen. This latter body, though not combuſtible itſelf, is the only *ſupporter of combuſtion* with which we are acquainted, and occupies a place, as the ſole member of a claſs having that title. An additional element has recently been held out as poſſeſſing theſe properties; but the ſubject has occaſioned much controverſy, and the weight of evidence ſeems at preſent to preponderate againſt the innovation inſiſted upon. For farther information on this point, the reader is referred to the articles MURIATIC and OXY-MURIATIC *Acids*. The name of the compound, into which oxygen enters as an ingredient, varies according to the nature of the properties exhibited by the product. When the product is an acid, it then receives a title determined by the acidified ſubſtance; but in every other caſe, the compound is merely termed an *oxyd*. In the union of oxygen with lead, for example, the reſult not being an acid, the ſubſtance obtained is called an *oxyd of lead*; and as different *doſes*, or quantities, of oxygen may unite with the ſame element, theſe are diſtinguiſhed either by the terms *firſt oxyd*, *ſecond oxyd*, and ſo on; or by prefixing derivatives from the Greek, as *proto*xyd, *deut*oxyd, from πρῶτος, *primus*, and δεύτερος, *ſecundus*; and in the ſame manner with the reſt. The combination of oxygen with elements capable of being acidified produces acids, which alſo receive a diſtinction according to the doſe of oxygen they contain. The firſt doſe of oxygen which unites with ſulphur gives exiſtence to a compound, not poſſeſſing acid properties. This, therefore, is merely an *oxyd of ſulphur*. The ſecond doſe, however, produces an acid; and the addition of a third quantity, another acid ſtill more powerful. According to the modern nomenclature, theſe are ſtyled the *ſulphurous* and *ſulphuric* acids; the terminations *ous* and *ic* being uſed to expreſs the lower and higher ſtates of acidification. In all the preceding caſes, the inflammable element is called the *baſe*; and the words *oxydate*, *oxydation*, *oxygenate*, *oxygenation*, *oxydize*, and *oxydizement*, are employed as different powers of the word *oxyd*, according to the grammatical value which it may be wiſhed to impart to it. The next change in the nomenclature ariſes from the combinations of the acids. Theſe never unite with the inflammable elements ſimply, nor until theſe elements have been previouſly combined with oxygen. Their products are then called *ſalts*, and the inflammable ſubſtance is termed their *baſe*. If the acid in combination with the baſe be in the lower ſtate of acidification, as the ſulphur*ous*, for example, the termination *ite*, or *it*, forms the characteriſtic of the claſs, added to the firſt ſyllable of the acid. Thus, the

the union of ſulphur*ous* acid with potaſh is a ſulph*ite* of potaſh; of nitr*ous* acid with the ſame baſe, a nitr*ite*; and of phoſphor*ous* acid, a phoſph*ite*. When the acid is at the *maximum* of acidification, the termination *at* is choſen, as ſulph*at*, nitr*at*, phoſph*at*. Since ſalts, however, may be compoſed of different proportions of the ſame acid and baſe, to point out this, a farther proviſion is required; and the atomic ſyſtem, concerning which much will be found under the various chemical articles of this work, furniſhes the moſt correct means of ſupplying the deficiency. According to the principles of this doctrine, bodies can unite only in certain definite proportions, determinable by the number of *atoms*, or *particles*, which combine to form the particular compound. In the caſe of ſalts, the uniting atoms are already *compounded*, being made up of the elementary atoms which compoſe the acid and baſe. This, however, makes no difference in the law. The ſimpleſt and moſt regular form of combination is when they unite one to one. All thoſe ſalts, therefore, which are conſtituted in this proportion, will receive the name before aſſigned, without any additional diſtinction. Thus, when an atom of lime unites with an atom of ſulphuric acid, the product is a ſulphat of lime; but if two atoms of baſe be attached to one of acid, it is then propoſed that the word *ſub* ſhould be prefixed; and if two atoms of acid to one of baſe, the word *ſuper*. This will not only immediately convey to the mind the condition of the ſalt, but, with the additional information which the atomic doctrine affords, at the ſame time appriſe us of the exact quantity of acid and baſe of which a given weight of the ſalt is compoſed. The terms *ſub* and *ſuper* have long been in uſe, to denote an exceſs or deficiency of baſe; but have never been employed with that ſyſtem, or regularity, ſo indiſpenſible to the efficiency of a ſcientific language. In many caſes, therefore, the application of them, as here recommended, it may be expected, will be at variance with former practice; and of this, the name uſually attached to the *ſalt of tartar* of the ſhops, ſuggeſts itſelf as an immediate proof. This ſubſtance has long been known under the title of *ſub-carbonat of potaſh*, either from the ſuppoſition that it contained an exceſs of baſe, or to diſtinguiſh it from a cryſtallized combination of the ſame ſort, which, from the circumſtance of its *being cryſtallized*, was conceived to be the more perfect form of the ſalt. Whichever might have been the reaſon, ſince the atom of this compound is evidently conſtituted of one atom of carbonic acid, and one of potaſh, it will, in conformity with the above rule, be denominated a *carbonat of potaſh*; the cryſtallized variety being a *ſuper-carbonat*. Other inſtances might be ſelected, but as a ſlight acquaintance with the principles of the atomic philoſophy will be ſufficient for their detection, it will be unneceſſary to extend the ſubject here. In the formation of ſalts, when an acid has taken up as much of any particular baſe as it can diſſolve, it is ſaid to be *ſaturated*; and the ſolution containing it is called a *ſaturated ſolution*. The word *neutral* is alſo uſed to expreſs the ſame ſtate; and all ſalts, the acid and baſe of which have loſt thoſe properties which diſtinguiſhed them when uncombined, are termed *neutral ſalts*. If the acid ſhould be in exceſs, and impart a ſour taſte to the product, the compound is uſually ſaid to be *acidulous*.

Reſpecting the orthography of chemical language, there is conſiderable difference of opinion. By ſome authors, the words are written according to the preciſe ſpelling introduced by the French inventors. This, however, is offenſive to the idiom of our tongue, and frequently inconſiſtent with the acknowledged rules for regulating ſuch caſes, in words ſimilarly derived. The moſt common inſtances of the practice here complained of are the addition of a final *e* to the leading names of ſalts, as *ſulphate*, *phoſphate*, &c.; and the ſubſtitution of *i* for *y*, in the words *oxygen*, *hydrogen*, *oxyd*, &c. Concerning the firſt of theſe, it may be ſufficient to ſay, that however conſonant it may be with the general conſtruction of the *French* language to add an *e* in caſes like the preceding, the ſpirit of *our own* directly forbids ſuch a form of word. The pronunciation alone is ſufficient to ſhew this; and nothing but the moſt ſervile copying of the original nomenclature could have introduced the practice amongſt us. Reſpecting the latter, the common rule, in derivations, of rendering the Greek υ into Engliſh by *y*, juſtifies the objection here made. Eſtabliſhed methods of this ſort ought never to be deviated from, except for very ample reaſons; and in the inſtance now under remark, caprice alone can have dictated the alteration.

NOMENTUM, *La Mentana*, in *Ancient Geography*, a town of Italy, in Latium. Pliny and Virgil have mentioned this town, which gave name to a Roman way, which paſſed by it from Rome, and joined the Salar way at Eratum. The ruins of this town occupy a conſiderable extent.

NOMENY, in *Geography*, a town of France, in the department of the Meurthe, and chief place of a canton, in the diſtrict of Nancy; 6 miles E. of Pont à Mouſſon. The place contains 1331, and the canton 15,833 inhabitants, on a territory of 285 kiliometres, in 45 communes.

NOMI, a town of Japan, in the iſland of Niphon; 16 miles S.E. of Kanazava.

NOMII, in *Ancient Geography*, a mountain of Arcadia, on which was a temple conſecrated to the god Pan, the Nomian, according to Pauſanias, l. viii. c. 38.

NOMINA VILLARUM an account of the names of all the villages, and the poſſeſſors thereof, in each county, drawn up by ſeveral ſheriffs, at the inſtance of king Edward II., and returned by them into the exchequer; where it is ſtill preſerved.

NOMINAL CHARACTERS. See CHARACTER.

NOMINALS, or NOMINALISTS, a ſect of ſchool-philoſophers, the diſciples and followers of Occam, or Ocham, an Engliſh Cordelier, in the 14th century.

The Nominaliſts were great dealers in words; whence they were vulgarly denominated *word-ſellers*.

They had the denomination Nominaliſts, becauſe, in oppoſition to the Realiſts, they maintained, that words, not things, were the object of dialectics.

This ſect had its firſt riſe towards the end of the 11th century, and pretended to follow Porphyry and Ariſtotle; but it was not till Occam's time that they bore the name. The chief of this ſect, in the 12th century, was a perſon called John, who, on account of his logical ſubtilty, was called the Sophiſt, and his principal diſciples were Robert of Paris, Roſceline of Compeigne, and Arnoul of Laon.

Porphyry, in his introduction to the Ariſtotelian logic, ſays, "Concerning genera and ſpecies, whether they have a real eſſence, or are barely conceptions of the mind, and if they ſubſiſt, whether corporeally or incorporeally, whether ſpiritually or only in the objects of ſenſe, I give no opinion, becauſe the ſubject is abſtruſe, and requires a larger diſcuſſion." This point, which Porphyry left undetermined, was reſumed in the ſchools, and the opinion of Ariſtotle, that univerſals ſubſiſt not prior to individual bodies, nor after them, but within them, and are the forms eternally united to matter, which make bodies to be ſuch as they are, univerſally prevailed, till, in the 11th century, Roſceline adopted the Stoic opinion, that univerſals have no real exiſtence either before or in individuals, but are mere names

or words by which the kinds of individuals are expreſſed; a tenet which was afterwards propagated by Abelard, and produced the ſect of the Nominaliſts. This new opinion gave great offence to the philoſophers and divines of the 11th century, perhaps chiefly becauſe Roſceline, by applying it to the doctrine of the Trinity, brought upon himſelf a ſuſpicion of hereſy. Many young perſons, however, ſtrenuouſly adhered to the ſide of the Nominaliſts; and the ſect, through the ingenuity and ability of Abelard and others, obtained many followers. Some of theſe, to avoid cenſure, changed their ground ſo far as to maintain, that univerſals conſiſt in notions and conceptions of the mind, formed by abſtraction; whence they were called *Conceptualiſts*. (See that article.) The Realiſts, too, were of different opinions, ſome leaning towards the doctrine of Plato, and others towards that of Ariſtotle. In the 12th century, the controverſy ſtill continued.

At the beginning the Nominals had the upper hand: but the Realiſts, though greatly divided among themſelves, were ſupported by men of great abilities; ſuch as Albertus Magnus, T. Aquinas, and Duns Scotus. The Nominal ſect became hereby into diſrepute; till William Occam, in the fourteenth century, again revived it, and filled France and Germany with the flame of diſputation. This ſect, enjoying the countenance and favour of Louis XI., almoſt univerſally flouriſhed in Germany. Having joined the party of the Franciſcan monks, who ſtrenuouſly oppoſed John XXIII. that pope himſelf, and his ſucceſſors after him, left no means untried to extirpate the philoſophy of the Nominaliſts, which was deemed highly prejudicial to the intereſts of the church: and hence it was, that in the year 1339, the univerſity of Paris, by a public edict, ſolemnly condemned and prohibited the philoſophy of Occam, which was that of the Nominaliſts. The conſequence was, that the Nominaliſts flouriſhed more than ever. In the fifteenth century, the controverſy was continued with more vigour and animoſity than ever; and the diſputants were not content with uſing merely the force of eloquence, but had frequently recourſe to more hoſtile and dangerous weapons; and battles were the conſequence of a philoſophical queſtion, which neither ſide underſtood. In moſt places, however, the Realiſts maintained a manifeſt ſuperiority over the Nominaliſts. While the famous Gerſon, and the moſt eminent of his diſciples were living, the Nominaliſts were in high eſteem and credit in the univerſity of Paris. But upon the death of theſe patrons, the face of things was much changed to their diſadvantage. In the year 1474, Lewis XI. by the inſtigation of his confeſſor, the biſhop of Avranches, iſſued out a ſevere edict againſt the doctrines of the Nominaliſts, and ordered all their writings to be ſeized and ſecured, that they might not be read by the people, requiring the academic youth to renounce their doctrines: upon this, the leaders of the ſect fled into Germany and England, whence, at the beginning of the Reformation, they met with a ſtrong reinforcement, in Luther, Melancthon, and others. However, the ſame monarch mitigated this edict the year following, and permitted ſome of the books of that ſect to be delivered from their confinement. In the year 1481, he not only granted a full liberty to the Nominaliſts and their writings, but alſo reſtored that philoſophical ſect to its former authority and luſtre in the univerſity. Moſheim, vol. iii. 8vo. Brucker's Phil. by Enfield, vol. ii.

The Nominaliſts were the founders of the univerſity of Leipſic: there are many yet abroad who pique themſelves on being Nominals.

The Nominals, with the Stoics, admit the formal conceptions or ideas of things, as the ſubject and foundation of univerſality; but to this they add names, which repreſent and ſignify, after the ſame univocal manner, and without any diſtinction, a great variety of ſingle things alike in genus and ſpecies.

Whence it is that they are called Nominals; as pretending, that to become learned, it is not enough to have juſt ideas of things, but it is likewiſe required to know the proper names of the genera and ſpecies of things, and to be able to expreſs them clearly and preciſely, without confuſion or ambiguity. See REALISTS.

NOMINATION, the act of naming and appointing a perſon for ſome function, employ, or benefice.

The word is chiefly uſed for the right of preſenting to a benefice, &c.

In common law, however, there is a difference between *nomination* and *preſentation*; the former being properly a power which a man has, by virtue of a manor, or otherwiſe, to appoint or name a clerk to a patron of a benefice, to be by him preſented to the ordinary. See PRESENTATION.

NOMINATIVE, in *Grammar*, the firſt caſe of nouns which are declineable.

The ſimple poſition, or laying down of a noun, or name, is called the *nominative caſe*: yet it is not ſo properly a caſe, as the matter or ground whence the other caſes are to be formed, by the ſeveral changes and inflections given to this firſt termination. See CASE.

Its chief uſe is to be placed in diſcourſe before all verbs, as the ſubject of the propoſition, or affirmation; as *Dominus regit me, the Lord governs me; Deus exaudit me, God hears me.*

NOMINATOR, he who names or preſents a perſon to an office, or benefice.

Hence *nominee*, the perſon named or preſented.

Errard obſerves, that there are ſome cuſtoms where the nominator is reſponſible for the ſolvibility of the nominee.

NOMINE PŒNÆ, in *Law*, is a penalty incurred for not paying rent, &c. at the day appointed by the leaſe or agreement, for the payment thereof.

NOMINIS IDENTITATE. See IDENTITATE.

NOMION, in *Muſic*, a kind of love-ſong with the Greeks.

NOMIQUE, NOMICAL *Mode*, or that kind of ſtyle in muſic which was ſacred to Apollo, god of verſe and ſong, in which every effort was tried to render it brilliant, and worthy of the divinity to whom it was conſecrated. See MODE, MELOPŒIA, and STYLE.

NOMISNY BAY, in *Geography*, a bay on the river Potomack, on the coaſt of Virginia. N. lat. 38° 11′. W. long. 76° 50′.

NOMOCANON, compounded of νομος, *law*, and κανων, *canon*, or *rule*, a collection of canons, and of imperial laws relative or conformable thereto. See CANON.

The firſt nomocanon was made by Johannes Scholaſticus, in 554. Photius, patriarch of Conſtantinople in 883, compiled another nomocanon, or collation of the civil laws with the canons: this is the moſt celebrated. Balſamon wrote a commentary on it in 1180.

NOMOCANON alſo denotes a collection of the ancient canons of the apoſtles, councils, and fathers; without any regard to imperial conſtitutions.

Such is the nomocanon publiſhed by M. Cotelier.

NOMOCANON is ſometimes alſo uſed for a *penitential* book of the Greeks.

NOMOPHYLACES, Νομοφυλακες, among the Athenians, magiſtrates who were to ſee the laws executed, being not unlike to our ſheriffs. They had the execution of criminals

minals committed to their care, as alſo the charge of ſuch as were confined priſoners. They had alſo power to ſeize thieves, kidnappers, and highwaymen, upon ſuſpicion; and, if they confeſſed the fact, to put them to death: if not, they were obliged to proſecute them in a judicial way.

NOMOPHYLACES were likewiſe officers belonging to the Olympic games, whoſe buſineſs it was to inſtruct thoſe who were to contend in all the laws of the games. See HELLENODICÆ.

NOMOTHETÆ, Νομοθεται, among the Athenians, were a thouſand in number, and choſen by lot out of ſuch as had been judges in the court Heliæa. Their office was not (as their name ſeems to imply) to enact new laws by their own authority, for that could not be done without the approbation of the ſenate, and the people's ratification; but to inſpect the old, and, if they found any of them uſeleſs, or prejudicial, as the ſtate of affairs then ſtood, or contradictory to others, they cauſed them to be abrogated by an act of the people. Beſides this, they were to take care that no man ſhould plough, or dig deep ditches within the Pelaſgian wall; to apprehend the offenders, and ſend them to the archon.

NO NEARER, in *Sea Language*, is the command given by the pilot or quarter-maſter to the helmſman, to ſteer the ſhip *no nearer* to the direction of the wind than the ſails will operate to advance the ſhip in her courſe.

NON, or NUN, in *Geography*, a city of Africa, in the province of Vled de Non, belonging to the empire of Morocco, two days' journey from the ſea-coaſt, and oppoſite to the cape of the ſame name.

NON, or *Nun*, *Cape*, a cape of the ſame province, diſcovered by the Portugueſe in the beginning of the fifteenth century, and ſo named by them, becauſe thoſe who doubled it firſt never returned. N. lat. 28° 38′. W. long. 11° 5′.

NON, *Vled de*. See VLED *de Non*.

NONA, (Œnona), a mean ſea-port town and biſhop's ſee of Dalmatia, ſituated on a ſmall iſland, ſurrounded by a harbour formerly capable of receiving large ſhips, but now a fœtid pool, at the mouth of a ſmall muddy river. No veſtige remains of the grandeur of the Roman times, nor any traces of its barbarous magnificence, when it was the reſidence of the kings of the Croat Slavi; 28 miles N.W. of Scardona. N. lat. 44° 28′. E. long. 15° 35′.

NON-ABILITY, in *Law*, an exception taken againſt the plaintiff in a cauſe, on ſome juſt ground why he cannot commence a ſuit in law; as præmunire, outlawry, being profeſſed in religion, excommunicate, or a ſtranger-born. This laſt holds only on actions real, and mixed: and not in perſonal, except he be both a ſtranger and an enemy. The civilians ſay, that ſuch a man hath not *perſonam ſtandi in judicio*. See DISABILITY.

NON-ADMITTAS. See NE *Admittas*.

NONÆ *and Decimæ*, were payments anciently made to the church by thoſe who were tenants of church-farms.

The *nonæ* were a rent or duty claimed for things belonging to huſbandry; the *decimæ* were claimed in right of the church.

NONAGE, in *Law*, an incapacity of doing certain things from want of age.

The term of *nonage* is different, with regard to different things. In matters of inheritance, a man is in his nonage till twenty-one years; for marriage only to fourteen, &c. See AGE and MINOR.

NONAGE, *Nonagium*, alſo denotes the ninth part of a man's moveable goods, anciently paid in the nature of a mortuary; being claimed by the clergy upon the death of thoſe of their pariſh.

At firſt this was a third part of the goods, and was called *tertiagium*; till by a bull of Clement VI. it was reduced to a ninth.

NONAGESIMAL, in *Aſtronomy*, the ninetieth degree of the ecliptic, reckoned from its eaſtern term, or point.

The altitude of the nonageſimal is equal to the angle of the eaſt; and, if continued, paſſes through the poles of the ecliptic: whence the altitude of the nonageſimal, at a given time, under a given elevation of the pole, is eaſily found.

If the altitude of the nonageſimal be ſubtracted from 90°, the remainder is the diſtance of the nonageſimal from the vertex.

NONAGON, a figure having nine angles and ſides.

NONAME, in *Geography*, a lake of North America, extending from N. lat. 60° about 50 miles N., and about 35 miles from E. to W., abounding with fine fiſh.

NONANCOURT, a town of France, in the department of the Eure, and chief place of a canton, in the diſtrict of Evreux; 7 miles W. of Dreux. The place contains 1145, and the canton 9019 inhabitants, on a territory of 172½ kiliometres, in 15 communes.

NONANT, a town of France, in the department of the Orne; 18 miles N. of Argentan.

NONANTALA, a town of Italy, in the department of the Panaro; 10 miles N.E. of Modena.

NON-APPEARANCE, in *Law*, a default in not appearing in a court of judicature. See APPEARANCE.

NONASPE, in *Geography*, a town of Spain, in Aragon; 18 miles E. of Alcaniz.

NON-ASSUMPSIT, in *Law*, a plea in perſonal actions, whereby a man denies any promiſe made, &c. or that he made any ſuch promiſe within ſix years, which is an effectual bar to the complaint.

NONATELIA, in *Botany*, a genus of Aublet's, ſo called from the name given it by the natives of Guiana, *Nono ateli*. Aubl. Guian. v. 1. 182. t. 70—74. Juſſ. 205. Lam. Illuſt. t. 155. (Oribaſia; Schreb. 123.)—This genus, which claims attention from the virtues attributed to an infuſion of the leaves of one of its ſpecies, in the aſthma, is referred by Schreber, p. 822, to PSYCHOTRIA. See that article.

NON-CLAIM, in *Law*, the omiſſion or neglect of him who challenges not his right within the time limited by law: as, within a year and a day, where continual claim ought to be made. See CLAIM.

By ſuch neglect he is either barred of his right; as upon non-claim within five years after a right accrued to him; or of his entry by deſcent, for want of a claim within five years after the diſſeiſin. An infant ſhall loſe nothing by non-claim, or neglect of demanding his right. See FINE.

NON COMPOS MENTIS, a phraſe denoting a perſon not to be of ſound memory or underſtanding.

Of this, in common law, there are ſaid to be four kinds. Firſt, an idiot born; ſecondly, he that by accident loſeth his memory and underſtanding; thirdly, a lunatic, that has *lucida intervalla*, ſometimes underſtanding, and ſometimes not; fourthly, he that by his own act, for a time, depriveth himſelf of his right ſenſes, as a drunkard. But this laſt kind ſhall give no privilege to him, or his heirs.

A deſcent takes away the entry of an idiot, though the want of underſtanding were perpetual. Under the general name of "non compos mentis," which ſir Edward Coke ſays (1 Inſt. 24.) is the moſt legal name, are compriſed not only lunatics, but perſons under frenzies; or who loſe their intellects by diſeaſe; thoſe that become deaf, dumb, and blind, not being born ſo; or ſuch, in ſhort, as are judged by the

court of chancery incapable of conducting their own affairs. To theſe, as well as to idiots, the king is guardian; and the law, always imagining that theſe accidental misfortunes may be removed, only conſtitutes the crown a truſtee for theſe unfortunate perſons, to protect their property, and to account to them for all profits received, if they recover, or after their deceaſe, to their repreſentatives. (17 Edw. II. c. 10. See LUNATIC.) On the firſt attack of lunacy, or other occaſional infanity, while there may be hopes of a ſpeedy reſtitution of reaſon, it is uſual to confine the unhappy objects in private cuſtody, under the direction of their neareſt friends and relations; and the legiſlature, to prevent all abuſes incident to ſuch private cuſtody, hath thought proper by ſtatute to interpoſe its authority for regulating private mad-houſes. (See MAD-HOUSE.) But when the diſorder is grown permanent, and the circumſtances of the party will bear ſuch additional expence, it is proper to apply to the royal authority to warrant a laſting confinement. The method of proving a perſon "non compos," is very ſimilar to that of proving him an idiot. The lord chancellor, to whom, by ſpecial authority from the king, the cuſtody of idiots and lunatics is entruſted (3 P. Wms, 108.), upon petition or information, grants a commiſſion in nature of the writ *de* IDIOTA *inquirendo*, to inquire into the party's ſtate of mind; and if he be found "non compos," he is treated in the manner already deſcribed under the article LUNATIC. Perſons that are "non compos," are incapable of making a will, as long as ſuch diſability laſts. In criminal caſes ſuch perſons are not chargeable for their own acts, if committed when under theſe incapacities; not even for treaſon itſelf. 3 Inſt. 6. See LUNATIC.

NON-CONFORMISTS is a general denomination comprehending all thoſe who do not conform to the eſtabliſhed worſhip of the church. Theſe are of two ſorts, *viz.* 1. Such as abſent themſelves from it through total irreligion, and attend the ſervice of no other perſuaſion: who by 1 Eliz. cap. 2. 23 Eliz. cap. 1. and 3 Jac. I. c. 4. forfeit one ſhilling to the poor every Lord's day they ſo abſent themſelves, and 20*l.* to the king if they continue ſuch default for a month together: and if they keep any inmate thus irreligiouſly diſpoſed, in their houſes, they forfeit 10*l. per* month. And 2. Such as abſent themſelves from the worſhip of the eſtabliſhed church, under the plea of conſcience; and theſe are Proteſtant diſſenters, to whom the term is commonly applied, and Papiſts. See TOLERATION.

The word is ſaid to have had its riſe from a declaration of king Charles I., who appointed that all the churches of England and Scotland ſhould have the ſame ceremonies and diſcipline; the acquieſcence wherein, or diſſenting from which, determined *conformity* and *non-conformity*.

But this diſtinction primarily related to the rites of worſhip and eccleſiaſtical laws, enacted by Edward VI. Thoſe who complied with them were *Conformiſts*, and thoſe who objected *Non-conformiſts*. See PURITANS.

NONCOVERY, in *Geography*, one of the Nicobar iſlands, S.E. of Camorta, ſeparated from it by an arm of the ſea, which might be made an uſeful harbour. The iſland is of a triangular form, of no great extent, and covered with wood. The inhabitants are few, and the produce, timber and hogs excepted, of inconſiderable importance. The iſland abounds with lime-ſtone. N. lat. 8° 5′. E. long. 94° 2′.

NONDAL, a town of Sweden, in the province of Finland; 10 miles W N.W. of Abo.

NON DAMNIFICATUS, in *Law*, is a plea to an action of debt upon a bond, with condition to ſave the plaintiff harmleſs. (Abr. 224.) If the condition of a bond be to ſave harmleſs only, *non damnificatus* is generally a good plea; but if it be to diſcharge the plaintiff, &c. then the manner of the diſcharge is to be ſhewn.

NON DECIMANDO. See MODUS *Decimandi*.

NON DISTRINGENDO, a writ not to diſtrain, uſed in divers caſes.

NONDORF, in *Geography*, a town of Auſtria; 6 miles N.W. of Sonneberg.

NONE, a town of France, in the department of the Po, at the conflux of the rivers None and Riotorto; 7 miles S.S.W. of Turin.

NONE, or *Nones*, *Nonæ*, one of the ſeventh canonical hours, in the Romiſh church. See HOUR.

None, or the ninth hour, is the laſt of the leſſer hours, that is ſaid before veſpers; and anſwers to three o'clock in the afternoon.

This ſingle office, and that for the dead, ends at nones; which, father Roſweyd obſerves, was anciently the hour for the breaking up of the ſynaxis, or uſual meetings at church of the primitive Chriſtians.

The hour of none was alſo the uſual time for taking the repaſt on faſt-days; though ſome would keep the faſt till night.

NONES, *Nonæ*, in the *Roman Calendar*, the fifth day of the months January, February, April, June, Auguſt, September, November, and December; and the ſeventh of March, May, July, and October: theſe four laſt months having ſix days before the nones, and the others only four.

The word apparently has its riſe hence, that the day of the nones was nine days before the ides, and might be called *nono-idus*.

March, May, July, and October, had ſix days in their nones; becauſe theſe alone, in the ancient conſtitution of the year by Numa, had thirty-one days a-piece; the reſt have only twenty-nine, and February thirty. But when Cæſar reformed the year, and made other months contain thirty-one days, he did not likewiſe allot them ſix days of nones.

NON-ENTITY, whatever has no real being, or is only conceived negatively, or claims only a negative denomination. See ESSE, ESSENCE, &c.

NONE-SO-PRETTY, in *Botany*. See SAXIFRAGA.

NON-ESSENTIAL MODES. See MODES.

NON EST CULPABILIS, NON *Cul.* q. d. *he is not guilty*, in *Law*, the general plea to an action of treſpaſs, whereby the defendant abſolutely denies the fact charged on him by the plaintiff: whereas, in other ſpecial pleas, the defendant grants the fact to be done, but alleges ſome reaſons in his defence, why he lawfully might do it.

As *non cul.* is the general anſwer in an action of treſpaſs, *i. e.* a criminal action civilly proſecuted; ſo is it in all actions criminally followed, either at the ſuit of the king, or others, wherein the defendant denies the crime objected to him.

NON EST FACTUM, is an anſwer to a declaration, whereby a man denieth that to be his bond or deed, whereupon he is impleaded.

NON EST INVENTUS, is the ſheriff's return to a writ, when the defendant is not to be found in his bailiwick. And there is a return that the plaintiff, *non invenit plegium*, on original writs. Shep. Epit. 1129.

NONESUCH, in *Geography*, a river of America, in the province of Maine, which runs into the ſea, N. lat. 43° 30′. W. long. 70° 20′.—Alſo, one of the ſmaller Bermuda iſlands.

NONESUCH *Harbour*, a harbour on the E. coaſt of Antigua. N. lat. 43 30′. W. long. 61° 23′.

NON IMPLACITANDO ALIQUEM DE LIBERO TENEMENTO SINE BREVI, in *Law*, a writ to prohibit bailiffs, &c. from diſtraining any man touching his freedom, without the king's writ.

NON INTROMITTENDO QUANDO BREVE PRÆCIPE IN CAPITE SUBDOLE IMPETRATUR, a writ directed to the juſtices of the bench, or in eyre, commanding them not to give one that had, under colour of intitling the king to land, &c. as holding of him *in capite*, deceitfully obtained the writ called *præcipe in capite*, any benefit thereof, but to put him to this writ of right. (Reg. Orig. 4.) This writ having dependence on the court of wards, ſince taken away, is now diſuſed.

NON JURIDICI DIES. See DIES.

NON-JURORS, are perſons that refuſe to take the oaths to the government, who are liable to certain penalties; and for a third offence to abjure the realm, by 13 & 14 Car. II. cap. 1. Parſons, vicars, &c. are to take the oaths, and give their aſſent to the declaration (14 Car. II. cap. 4.) or they ſhall not preach, under the penalty of 40*l.* &c. (Stat. 17 Car. II. cap. 2) Eccleſiaſtical perſons not taking the oaths on the Revolution, were rendered incapable to hold their livings: but the king was empowered to grant ſuch of the nonjuring clergy as he thought fit, not above twelve, an allowance out of their eccleſiaſtical benefices for their ſubſiſtence, not exceeding a third part. (1 W. & M. ſeſſ. 1. cap. 8.) Perſons refuſing the oaths ſhall incur, forfeit, and ſuffer the penalties inflicted on Popiſh recuſants, and the court of exchequer may iſſue out proceſs againſt their lands, &c. 7 & 8 Will. III. cap. 27. See the ſtat. 2 Geo. I. cap. 13. and OATHS.

The non-jurors, or high-church men, were particularly diſtinguiſhed by the following principles: 1. They maintained the doctrine of paſſive obedience. 2. That the hereditary ſucceſſion to the throne is of divine inſtitution, and, therefore, can never be interrupted, ſuſpended, or annulled, on any pretext. 3. That the church is ſubject to the juriſdiction, not of the civil magiſtrate, but of God alone, particularly in matters of a religious nature. 4. That, conſequently, the biſhops depoſed by king William III. remained, notwithſtanding their depoſition, true biſhops to the day of their death; and that thoſe who were ſubſtituted in their places were the unjuſt poſſeſſors of other men's property. 5. That theſe unjuſt poſſeſſors of eccleſiaſtical dignities were rebels againſt the ſtate, as well as ſchiſmatics in the church, and that all, therefore, who held communion with them, were alſo chargeable with rebellion and ſchiſm. And, 6. That this ſchiſm, which rends the church in pieces, is a moſt heinous ſin, whoſe puniſhment muſt fall heavy on all thoſe who did not return ſincerely to the true church, from which they have departed. See *High* CHURCH.

NONIUS, MARCELLUS, in *Biography*, a grammarian and peripatetic philoſopher, who flouriſhed about the fourth century, was a native of Tibur, now Tivoli. He is known by a work, entitled "De Proprietate Sermonis," now extant, and which has gone through ſeveral editions, of which the beſt is that printed at Paris in the year 1614. The author, ſays the writer of the article in the Biographical Dictionary, has little claim to the praiſe of accurate learning or judgment, and the work itſelf is chiefly valuable for the paſſages which he cites from authors no where elſe to be met with.

NONIUS, PETER, in Spaniſh *Nunez*, a learned Portugueſe, and one of the ableſt mathematicians of the ſixteenth century, was a native of Alcacer. He was preceptor to don Henry, king Emanuel's ſon, and taught the mathematics in the univerſity of Coimbra. He publiſhed the following works, by which he gained great reputation; "De Arte Navigandi:" Annotationes in theorias planetarum Purbachii:"a treatiſe "De Crepuſculis;" and "A Treatiſe on Algebra." It has been ſaid that Peter Nonius, in 1530, firſt invented the angles of 45 degrees, made in every meridian, that he called them rhumbs in his language, and calculated them by ſpherical triangles. Nonius died in 1577, at the age of eighty: ſee the next article.

NONIUS is a name erroneouſly given to the method of graduation now generally uſed in the diviſion of the ſcales of various inſtruments, and which ſhould be called Vernier, from its real inventor. The method of Nonius, ſo called from its having been invented by Pedro Nunez, or Nonius, and deſcribed in his treatiſe "De Crepuſculis," printed at Liſbon in 1542, conſiſts in deſcribing within the ſame quadrant, forty-five concentric circles, dividing the outermoſt into ninety equal parts, the next within into eighty-nine, the next into eighty-eight, &c. till the innermoſt was divided into forty-ſix only. By this means, in moſt obſervations, the plumb-line or index muſt croſs one or other of thoſe circles very near a point of diviſion: whence by computation, the degrees and minutes of the arc might be eaſily computed. This method is alſo deſcribed by Nonius, in his treatiſe "De Arte atque Ratione Navigandi, lib. ii. cap. 6." where he would perſuade himſelf, that it was not unknown to Ptolemy. But as the degrees are thus divided very unequally, and it is very difficult to attain exactneſs in the diviſion, eſpecially when the numbers into which the arcs are to be divided are incompoſite, of which there are no leſs than nine, the method of diagonals, firſt publiſhed by Thomas Digges, eſq. in a treatiſe intitled "Alæ ſeu Scalæ Mathematicæ," printed at London in 1573, and ſaid to be invented by one Richard Chanſeler, a very ſkilful artiſt, was ſubſtituted in its room. However, Nonius's method was improved at different times; but the admirable diviſion now ſo much in uſe, is the moſt conſiderable improvement of it. See VERNIER.

NON LIQUET, *it does not appear*, in *Law*, a verdict given by a jury, when a matter is to be deferred to another day of trial.

The ſame phraſe was uſed among the Romans: after hearing a cauſe, ſuch of the judges as thought it not ſufficiently clear to pronounce upon, caſt a ballot into the urn with the two letters *N. L.* for *non liquet*.

NON MERCHANDIZANDO VICTUALIA, a writ to juſtices of aſſize to enquire whether the magiſtrates of ſuch a town do ſell victuals in groſs, or by retail, during the time of their being in office, which is contrary to an ancient ſtatute, and to puniſh them if they do. Reg. Orig. 184.

NON MOLESTANDO, a writ which lies for him who is moleſted contrary to the king's protection granted him. Reg. of Writs, 184.

NON-NATURALS, in *Medicine*, *res non naturales*, are the cauſes and effects of diſeaſes, whether near or remote.

Phyſicians have digeſted all the cauſes of diſeaſes into ſix claſſes, which they call the ſix non-naturals. Theſe are, 1. Air. 2. Meat and drink. 3. Motion and reſt. 4. The paſſions of the mind. 5. Excretions and retentions. 6. Sleep and waking. See each under its proper article. They are thus called, becauſe, by their uſe or abuſe, they become either good, *naturals*; or evil, *contra-naturals*.

But the diviſion, in effect, is of no great uſe; the cauſes

of

of diſeaſes being much more commodiouſly laid down otherwiſe. See Boerhaave's diviſion of the non-naturals under CAUSE.

NONNUS, in *Biography*, a Greek poet, who flouriſhed in the fifth century, was a native of Panopolis in Egypt, and was author of two works, on very different ſubjects, but generally admitted to be from the ſame pen. The firſt, entitled "Dionyſiacs," a poem of forty-eight books, contains a hiſtory of Bacchus, and is ſaid to comprehend a vaſt miſcellany of heathen mythology and erudition. The ſecond is a metrical "Paraphraſe of the Goſpel of St. John." This is valuable, as affording ſome important, various readings, which have been collected by editors of the New Teſtament. He omits the ſtory of the woman taken in adultery. The "Dionyſiacs" were firſt printed at Antwerp in 1569. They were reprinted, with a Latin verſion, at Hanau in 1605, and afterwards by Cunæus in 1610. Of his paraphraſe there have been a number of editions, but the beſt is that of Daniel Heinſius in 1627. Moreri.

NONO, in *Geography*, a town of Abyſſinia; 100 miles S. of Miné.

NONOABA, a town of Mexico, in New Biſcay; 105 miles W. of Parral.

NON OBSTANTES, *Notwithſtanding*, in *Law*, a clauſe frequent in ſtatutes and letters patent; importing a licence from the king to do a thing, which at common law might be lawfully done; but being reſtrained by act of parliament could not be done without ſuch licence. Vaugh. 347. Plowd. 501.

All grants of ſuch penſions, and every *non obſtante* therein contained, ſhall be void. Henry III. took up the clauſe, *non obſtante* (firſt introduced by the pope), in his grants.

But the doctrine of *non obſtantes*, which ſets the prerogative above the laws, was effectually demoliſhed by the bill of rights at the revolution, and abdicated Weſtminſter-hall when king James abdicated the kingdom. It is enacted by 1 W. & M. ſeſſ. 2. cap. 2. that no diſpenſation by *non obſtante*, of or to any ſtatute, or any part thereof, ſhall be allowed, but that the ſame ſhall be held void and of none effect, except a diſpenſation be allowed in ſuch ſtatute.

NON OBSTANTES, in the *Romiſh Canon-Law*, make the third part of the proviſions of the court of Rome, beginning with *non obſtantibus*, and compriſing abſolutions from cenſures, rehabilitations, and neceſſary diſpenſations for the enjoyment of benefices. None inferior to the pope can uſe the clauſe *non-obſtante*.

NON OMITTAS, a writ which lies where the ſheriff having delivered a writ or proceſs to a bailiff of a franchiſe in which the party it is to be ſerved on dwells, and the bailiff having refuſed or neglected to ſerve it, upon the ſheriff's returning that he delivered it to the bailiff, this ſecond writ ſhall be directed to the ſheriff, charging him to enter the franchiſe, and execute the king's command, either by himſelf or officer.

NON-PAYMENT of eccleſiaſtical dues to the clergy, as penſions, mortuaries, compoſitions, offerings, and whatſoever falls under the denomination of ſurplice fees, for marriages or other miniſterial offices of the church, is a pecuniary injury, cognizable in the ſpiritual courts: redreſſed by a decree for their actual payment. Beſides which all offerings, oblations, and obventions, not exceeding the value of 40*s*., may be recovered in a ſummary way before two juſtices of the peace.

NON PLEVIN, *Non plevina*, a default in not replevying of land in due time. See REPLEVIN.

In Hengham Magna, it is ſaid, that the defendant ſhould be ſure to replevy his lands ſeized by the king within fifteen days; and that if he neglects, then, at the inſtance of the plaintiff at the next court-day, he ſhall loſe his ſeiſin, *ſicut per defaltam poſt defaltam*. But, by ſtat. 9 Edw. III. it was enacted, that no perſon ſhould loſe his land thenceforward becauſe of *non plevin*.

NON PONENDO IN ASSISIS, & JURATIS, a writ granted on divers occaſions to perſons for freeing them from ſerving on aſſizes and juries; as by reaſon of old age, charter of exemption, or the like. This writ is founded on the ſtats. Weſt. 2. 13 Edw. I. ſt. 1. c. 38. and articuli ſuper chartis, 28 Edw. I. ſt. 3. c. 9. F. N. B. 165. 2 Inſt. 127. 447.

NON PROCEDENDO AD ASSISAM REGE INCONSULTO, a writ to ſtop the trial of a cauſe appertaining to one who is in the king's ſervice, &c. till the king's pleaſure be farther known. Reg. Orig. 220.

NON PROS, or *Non* PROSEQUITUR. See NOLLE *Proſequi* and NON-SUIT.

NON-RESIDENCE is applied to ſuch ſpiritual perſons as are not reſident on, but abſent themſelves from their benefices or dignities. See BENEFICE.

Regularly, perſonal reſidence is required of eccleſiaſtical perſons upon their cures; though there are ſome exceptions in favour of particular perſons, as king's chaplains, biſhops, &c. See RESIDENCE.

NON RESIDENTIA PRO CLERICIS REGIS, is a writ directed to the ordinary, charging him not to moleſt the clerk employed in the king's ſervice, on account of his non-reſidence, in which caſe he is to be diſcharged. Reg. Orig. 58.

NON SANÆ MEMORIÆ, or NON *Sane Memorie*, is an exception taken to an act declared to be done by another, importing that it was done at a time when the party that did it was mad, or not in his proper ſenſes. See NON COMPOS.

NON SOLVENDO PECUNIAM, *ad quam clericus mulctatur pro non reſidentia*, a writ prohibiting an ordinary to take a pecuniary mulct, impoſed on a clerk of the king's for non-reſidence. Reg. of Writs, fol. 59.

NON SPISSUM, in the *Ancient Muſic*. See APYCNON.

NONSUCH, in *Agriculture*, a term provincially applied to trefoil and rye-graſs, as *black* and *white* nonſuch.

NONSUCH *Clay*, a particular ſort of earth, which mixed with another clay brought from Worceſterſhire, makes a compoſition very uſeful for making the melting-pots uſed in the green glaſs making.

NON-SUIT, in *Law*, the dropping or letting fall a ſuit or action. Non-ſuit is a renunciation of a ſuit, by the plaintiff or demandant; moſt commonly upon the diſcovery of ſome error, or defect, when the matter is ſo far proceeded in, as that the jury is ready at the bar to deliver their verdict. The civilians term it *litis renuntiatio*.

If the plaintiff in an action neglects to deliver a declaration for two terms after the defendant appears, or is guilty of other delays or defaults againſt the rules of law in any ſubſequent ſtage of the action, he is adjudged *not to follow* or purſue his remedy as he ought to do, and thereupon a non-ſuit, or *non proſequitur*, is entered: and he is ſaid to be *non proſ'd*. And for thus deſerting his complaint, after making a falſe claim or complaint (*pro falſo clamore ſuo*) he ſhall not only pay coſts to the defendant, but is liable to be amerced to the king. A *retraxit* differs from a non-ſuit, in that the one is negative and the other poſitive: the non-ſuit is a mere default and neglect of the plaintiff, and therefore he is allowed to begin his ſuit again, upon payment of coſts; but a

*retraxit*

*retraxit* is an open and voluntary renunciation of his ſuit, in court, and by this he for ever loſes his action. (See Discontinuance *of Proceſs.*) Before the jury gave their verdict on a trial, it was formerly uſual to *call* or demand the plaintiff, in order to anſwer the amercement, to which by the old law he was liable in caſe he failed in his ſuit. And it is now uſual to call him, whenever he is unable to make out his caſe, either by reaſon of his not adducing any evidence in ſupport of it, or any evidence ariſing in the proper county. The caſes in which it is neceſſary that the evidence ſhould ariſe in a particular county, are either where the action is in itſelf local, or made ſo by act of parliament, as in actions upon penal ſtatutes, &c. or where upon a motion to change or retain the venue, the plaintiff undertakes to give material evidence in the county where the action was brought. (2 Black. Rep. 1039.) If upon the plaintiff's being called, neither he, nor any body for him, appears, he is non-ſuited, the jurors are diſcharged, the action is at an end, and the defendant ſhall recover his coſts. The reaſon of this practice is, that a non-ſuit is more eligible for the plaintiff than a verdict againſt him; for after a non-ſuit, which is only a default, he may commence the ſame ſuit again for the ſame cauſe of action; but after a verdict had, and judgment conſequent thereupon, he is for ever barred from attacking the defendant upon the ſame ground of complaint. But in caſe the plaintiff appears, the jury by their foreman deliver in their verdict. (See Jury.) It is enacted by the ſtatute 14 Geo. II. c. 17, that if after iſſue joined, the cauſe is not carried down to be tried according to the courſe of the court, the plaintiff ſhall be eſteemed to be non-ſuited, and judgment ſhall be given for the defendant, as in caſe of a non-ſuit. Bl. Comm. vol. iii.

NON SUM Informatus. See Informatus *non ſum.*

NON-TENURE, a plea in bar to a real action, whereby the party (the defendant) urges, that he holdeth not the land mentioned in the plaintiff's count or declaration, or at leaſt ſome part of it. Stat. 25 Ed. III. c. 16. 1 Mod. Rep. 250.

Weſt diſtinguiſhes non-tenure into *general* and *ſpecial.* The firſt where one denies himſelf ever to have been tenant of the land in queſtion. The ſecond where he only alleges, that he was not tenant on the day whereon the writ was purchaſed.

NON-TERM, the time of vacation between term and term. See Vacation.

It was anciently called *the time* or *days of the king's peace.* See Peace *of God and the Church.*

Among the Romans it was called *feriæ*, or *dies nefaſti.*

NONTRON, in *Geography*, a town of France, and principal place of a diſtrict, in the department of the Dordogne; 21 miles N. of Perigueux. The place contains 2809, and the canton 12,458 inhabitants, on a territory of 275 kiliometres, in 16 communes. N. lat. 45° 32′. E. long. 0° 44′.

NON USER, or Neglect, in *Law*, is of itſelf a direct and immediate cauſe of forfeiture in public offices, that concern the adminiſtration of juſtice, or the commonwealth; but non-uſer of a private office is no cauſe of forfeiture, unleſs ſome ſpecial damage is proved to be occaſioned thereby. Co. Litt. 233.

NONUPLA, in the *Italian Muſic*, denotes a quick time, peculiar to jigs. This ſpecies of time is otherwiſe called *the meaſure of nine times*, which requires two falls of the hand, and one riſe. There are three ſorts of nonupla. 1. *Nonupla di ſemi-minime*, or *dupla ſeſqui quarta*, thus marked $\frac{9}{4}$, where nine crochets are to be in the bar, of which four make a ſemi-breve in common time, *i. e.* in the down ſtroke, ſix, and but three up; it is uſually beat *adagio*. 2. *Nonupla di crome*, or *ſeſqui ottava*, marked thus $\frac{9}{8}$, wherein nine quavers make a bar, inſtead of eight in common time, *i. e.* ſix down, and three up: it is beat *preſto*. 3. *Nonupla di ſemi-crome*, or *ſuper ſetti partiente nona*, thus diſtinguiſhed $\frac{9}{16}$, in which nine ſemi-quavers are contained in a bar, whereof ſixteen are required in common time, ſix down, and three up: it is ordinarily beat *preſtiſſimo.* See Adagio, Presto, and Prestissimo.

Beſides theſe, there are two other ſpecies of nonupla, for which ſee Triple.

NONUS *Humeri Placentini*, in *Anatomy*, a muſcle, called alſo rotundus minor.

NONZA, in *Geography*, a town of Corſica; 8 miles N.W. of Baſtia.

NOODT, Gerard, in *Biography*, a celebrated juriſt, was born in 1647 at Nimeguen, where he was educated. He particularly attached himſelf to the ſtudy of juriſprudence; and in the third year of his academical courſe, ſuſtained two public diſputations. After this he viſited the univerſities of Leyden, Utrecht, and Franeker: at the laſt he took his degree of doctor of law. This was in the year 1669; and after his return to Nimeguen, he was choſen ordinary profeſſor of law, being then only 24 years of age. In 1679 he was elected profeſſor of law at Franeker; and in 1684 he accepted the ſame office at the univerſity of Utrecht. In 1686 he removed to Leyden, where he undertook the profeſſorſhip. This was his final reſidence: he was twice rector of that univerſity, and died there in 1725, at the age of 78. He was laborious in his profeſſion, and animated with a truly philoſophical ſpirit. His writings upon ſome of the moſt important topics of juriſprudence were publiſhed collectively by himſelf, in a quarto volume; of which a better and enlarged edition was given at Leyden, in two volumes, folio, in 1735, with the author's life, by M. Barbeyrac. His treatiſes, "De Jure Summi Imperii et Lege Regia," and "De Religione ab Imperio, Jure Gentium, libera," were tranſlated into the French language by Barbeyrac, and publiſhed ſeparately; the latter under the title of "Diſcours ſur la Liberté de Conſcience." In the firſt of theſe treatiſes, the author ſupports republican principles of government; in the ſecond, he carries toleration in matters of religion to the full extent. Moreri.

NOOGA, in *Geography*, a river of Africa, which runs into the Indian ſea, S. lat. 28° 30′.

NOOGOO, one of the ſmall Friendly iſlands; 3 miles N.E. of Tongataboo.

NOOGOONAMO, one of the Hapaee iſlands; S.E. of Haano.

NOOHEEVA, or *Federal Iſland*, one of the Ingraham iſlands in the Pacific ocean. S. lat. 8° 58′. W. long. 140° 5′.

NOOK *of Land*, *Nocata Terræ.* In an old deed of ſir Walter de Pedwardyn, twelve acres and a half of land were called a *nook of land;* but the quantity is generally uncertain.

NOOKEETAH, in *Geography*, a town of Bengal; 45 miles N.E. of Nattore.

NOONGOLAH, a town of Hindooſtan, in Bengal; 12 miles E. of Goragot.

NOONGOTTY, a town of Hindooſtan, in the circar of Sohagepour; 28 miles S.E. of Sohagepour.

NOONINGS, in *Agriculture*, a term provincially uſed to ſignify working dinner-times, or a period of reſt for plough teams.

NOONOYAN, in *Geography*, a town on the weſt coaſt

of the iſland of Mindanao. N. lat. 7° 40′. E. long. 122 20′.

NOONY, a town of Bengal, in the circar of Hendooa; 34 miles N. of Nagore. N. lat. 28°. E. long. 87° 7′.

NOOPOUR, a town of Hindooſtan, in Guzerat; 55 miles E. of Surat. N. lat. 21° 11′. E. long. 73° 50′.

NOORALDGEN, a town of Hindooſtan, in Lahore; 35 miles E.S.E. of Lahore.

NOORBATORNZIA, a town of Thibet; 5 miles S. of Peinom Jeung.

NOORGUNGE, a town of Hindooſtan, in Oude; 8 miles W. of Fyzabad.—Alſo, a town in Oude; 30 miles E. of Lucknow.

NOORMEHAL, a town of Hindooſtan, in Lahore; 40 miles E.S.E. of Sultanpour.

NOORNAGUR, a town of Hindooſtan, in Bengal; 22 miles N. of Comillah.

NOORPOUR, a town of Hindooſtan, and capital of a diſtrict, in the ſubah of Lahore; 70 miles N.E. of Lahore. N. lat. 32° 12′. E. long. 75° 5′.—Alſo, a town of Bengal; 20 miles S.W. of Dacca. See NURPUR.

NOORT POINT, the north cape of the port of Coquimbo, in Chili.

NOOSE. See NOOZE.

NOOTKA, or *King George's Iſland*, in *Geography*, an iſland in Nootka Sound. N. lat. 49° 35′. E. long. 126° 40′.

NOOTKA *Sound*, firſt called by captain Cook, on his diſcovery of it in April, in the year 1778, "King George's Sound," a bay of the North Pacific ocean, on the weſt coaſt of North America; the entrance of which is ſituated in the eaſt corner of Hope bay, in N. lat. 49° 33′, and E. long. 233° 12′. This ſound was entered by Cook between two rocky points, lying E.S.E. and W.N.W. from each other, at the diſtance of between three and four miles. Within theſe points the ſound widens conſiderably, and extends in, to the northward, four leagues at leaſt, excluſively of the ſeveral branches towards its bottom, which were not aſcertained. The middle of the ſound preſents a number of iſlands of various ſizes. Here, as well as cloſe to ſome parts of the ſhore, the depth of water is from 47 to 90 fathoms, and even more. The harbours and anchoring places, within its circuit, are numerous. The cove in which the Britiſh ſhips lay was on the eaſt ſide of the ſound, and on the eaſt ſide of the largeſt of the iſlands. Although covered from the ſea, it is expoſed to the ſouth-eaſt winds, which occaſionally blow with deſtructive violence. The land that borders on the ſea-coaſt is of a middling height, and level; but within the ſound, it riſes every where into ſteep hills, terminating in round or blunted tops, with ſome ſharp prominent ridges on their ſides. Their height is moderate, and even the higheſt of them are entirely covered to their ſummits with the thickeſt woods, as well as every flat part towards the ſea. Some few ſpots, which are bare, indicate the general rocky diſpoſition of theſe hills. The only ſoil upon them is a kind of compoſt, produced from rotten moſſes and trees, about two feet deep. The little coves in the ſound have beaches compoſed of fragments of rock, intermixed with pebbles; and they are furniſhed with large maſſes of fallen wood, driven in by the tide, together with rills of freſh water, ſufficient for the uſe of a ſhip, apparently ſupplied from the rains and fogs that hover about the tops of the hills. The water of theſe rills is perfectly clear, and eaſily diſſolves ſoap. The climate, as far as our navigators had any experience of it, is infinitely milder than that on the eaſt coaſt of America, under the ſame parallel of latitude. The mercury in the thermometer, even in the night, was never lower than 42°, and in the day it very often roſe to 60°. Froſt was not perceived in any part of the low ground, but vegetation had made a conſiderable progreſs. The trees, which grow very vigorouſly, and to a large ſize, are chiefly the Canadian pine, white cypreſs, the wild pine, and two or three other ſorts of pine leſs common. Of other vegetable productions there is little variety. Among the rocks, and at the verge of the woods, were found ſtrawberry plants, ſome raſpberry, currant, and gooſeberry buſhes, in a flouriſhing ſtate, with a few ſmall black alder trees. There are likewiſe a ſpecies of ſow-thiſtle, gooſe-graſs, ſome crow's foot, with a fine crimſon flower, and two ſorts of anthericum, one with a large orange flower, and another with a blue one. In the ſame ſituations were found ſome wild roſe-buſhes juſt budding, young leeks with triangular leaves, a ſmall ſort of graſs, water-creſſes, and andromeda in great abundance. Within the woods were moſſes and ferns of different ſorts. As captain Cook and his companions lay in a cove on an iſland, they obſerved in the woods there only two or three racoons, martins, and ſquirrels; and the account they give us of the quadrupeds is taken merely from the ſkins, which were brought by the natives for ſale; and theſe were often in a very mutilated ſtate, and ſcarcely enabled them to determine to what animals they belonged. The moſt common were bears, deer, foxes, and wolves. The ſea-animals ſeen off the coaſt were whales, porpoiſes, and ſeals. The ſea-otter alſo abounds here: and the fur of this animal is ſofter and finer than that of any others; ſo that the diſcovery of this part of the continent of North America, where ſo valuable an article of commerce may be obtained, cannot be a matter of indifference. Birds are ſcarce both as to ſpecies and number: thoſe which frequent the woods are crows and ravens, of the ſame kind with thoſe in England, a blueiſh jay or magpie, common wrens, the Canadian or migrating thruſh, and a conſiderable number of brown eagles, with white heads and tails. Amongſt thoſe which were diſtinguiſhable by their dried ſkins, or certain fragments, were a ſmall ſpecies of hawk, a heron, and the large creſted American king-fiſher. Here alſo are different ſpecies of wood-peckers, ſome ſmall birds of the finch kind, the ſand-piper, and humming-birds. Off the coaſt were ſeen the quebrantahueſſos, gulls, and ſhags, wild-ducks, ſwans, and plovers. Fiſh are more plentiful than birds, though the variety is not great: the principal ſorts are the common herring and ſardine, which come in large ſhoals, and at ſtated ſeaſons. Breams, both the ſilver-coloured and gold-brown coloured, are next to the former in quantity. There are other fiſhes, which are ſcarce. Sharks ſometimes frequent the ſound. The other marine animals are a ſmall cruciated meduſa or blubber, ſtar-fiſh, ſmall crabs, and the cuttle-fiſh. About the rocks are large muſcles, ſea-ears, and ſhells of large chamæ; and the ſmaller ſorts are trochi, murex, rugged wilks, and ſnails. Beſides theſe, there are ſome ſmall cockles and limpets. In the ſound, or upon the coaſt, there is red coral, as it was found in the canoes of the natives. The only animals of the reptile kind obſerved here, and found in the woods, were brown ſnakes, with whitiſh ſtripes on the back and ſides, which are harmleſs; and browniſh water-lizards. The inſect tribe forms a numerous claſs; but of minerals, no ores of any metal were ſeen, if we except a coarſe, red, earthy or ochry ſubſtance, uſed by the natives in painting themſelves, which may probably contain a little iron; with a white and blueiſh pigment, uſed for the ſame purpoſe. Beſides the ſtone or rock that conſtitutes the mountains and ſhores, which ſometimes contains pieces of very coarſe quartz, here were found a hard black granite, a greyiſh whet-ſtone, the common oil-

ſtone of our carpenters. The natives alſo uſe the tranſparent leafy glimmer, or Muſcovy glaſs, and rock-cryſtal.

The perſons of the natives are, in general, under the common ſtature, but not ſlender in proportion; being commonly pretty full or plump, though not muſcular. The viſage of moſt of them is round and full, and ſometimes alſo broad, with high prominent cheeks; and, above theſe, the face is frequently much depreſſed, or falling in between the temples; the noſe is flat at its baſe, the noſtrils are wide, and its point is rounded; the forehead low, the eyes ſmall, black, and rather languiſhing than ſparkling; the mouth round, with large round thickiſh lips; the teeth tolerably equal and well ſet, but not remarkably white. They have either no beards at all, which is moſt commonly the caſe, or a ſmall thin one upon the point of the chin, which is owing not to a natural defect of hair, but to its being plucked out; ſome, and particularly the old men, have not only conſiderable beards all over the chin, but whiſkers or muſtachios. Hence we may conclude, that the remarks of M. de Paw, Dr. Robertſon, and other writers, exemplified in the defect of beards among the Americen Indians, are unfounded. The eye-brows are ſcanty and narrow; but the hair of the head is abundant, and alſo very coarſe and ſtrong; and, without a ſingle exception, black, ſtraight, and lank, or hanging down over the ſhoulders; the neck is ſhort, the arms and body clumſy; and the limbs ſmall, in proportion to the other parts, as well as crooked, or ill-made, with large feet badly ſhaped, and projecting ankles. It is not eaſy to diſtinguiſh their true colour, as their bodies are ineruſted with paint and dirt; but where it could be perceived, the whiteneſs of the ſkin appeared almoſt to equal that of the Europeans, eſpecially thoſe in ſouthern latitudes. The whole body of the people ſeems to be characteriſed by countenances, exhibiting a dull phlegmatic want of expreſſion. The women reſemble the men in ſize, form and colour, nor are the ſexes eaſily diſtinguiſhable; of the females, none even of thoſe who are in the prime of life, have the leaſt pretenſion to be called handſome. Their common dreſs is a flaxen garment, or mantle, ornamented on the upper edge by a narrow ſtrip of fur, and at the lower edge, by fringes or taſſels; this paſſes under the left arm, and is tied over the right ſhoulder by a ſtring before and another behind, near its middle. Over this, which reaches below the knees, is worn a ſmall cloak of the ſame ſubſtance, likewiſe fringed at the lower part. The head is covered with a cap, of the figure of a truncated cone, or like a flower-pot, made of fine matting, having the top frequently ornamented with a round or pointed knob, or bunch of leathern taſſels, and faſtened under the chin. Beſides this dreſs, which is common to both ſexes, the men frequently throw over their other garments the ſkin of a bear, wolf, or ſea-otter, with the hair outward; in rainy weather they throw a coarſe mat about their ſhoulders; and they have alſo woollen garments which are little uſed. As they rub their bodies conſtantly over with a red paint, made of a clayey or coarſe ochry ſubſtance, mixed with oil, their garments contract a rancid offenſive ſmell, and a greaſy naſtineſs. Theſe garments, and alſo their heads, ſwarm with vermin, which they pick off with great compoſure, and eat. Although their bodies are always covered with paint, their faces are often ſtained with a black, a brighter red, or a white colour, by way of ornament; and this gives them a ghaſtly diſguſting aſpect. They alſo ſtrew the brown martial mica upon the paint, which makes it glitter. The ears of many of them are perforated in the lobe with a large hole, and with two others higher up on the outer edge; and in theſe holes they hang bits of bone, quills fixed on a leathern ſtring, ſmall ſhells, bunches of woollen taſſels, or pieces of thin copper. The ſeptum of the noſe is alſo ſometimes perforated, through which they draw a piece of ſoft cord; and others wear, in the ſame place, ſmall thin pieces of iron, braſs, or copper, ſhaped almoſt like a horſe-ſhoe, the narrow opening of which receives the ſeptum, ſo as that the two points may gently pinch it; and the ornament thus hangs over the upper lip. About their wriſts they wear bracelets or branches of white bugle beads, made of a conic ſhelly ſubſtance, bunches of thongs, with taſſels, or a broad black ſhining horny ſubſtance of one piece. About their ankles they alſo wear many folds of leathern thongs, or the ſinews of animals twiſted to a conſiderable thickneſs. On extraordinary occaſions, when they exhibit themſelves as ſtrangers, in viſits of ceremony, and when they go to war, they wear the ſkins of animals, as of bears and wolves, curiouſly ornamented; and on the head a quantity of withe, or half-beaten bark wrapped about it, with large feathers, particularly thoſe of eagles, interſperſed with ſmall white feathers. The face is alſo variouſly painted, with different colours and gaſhes, or beſmeared with a kind of tallow, mixed with paint, formed into various figures, and appearing like carved work. Their hair is alſo ſeparated into ſmall parcels, and tied at intervals of about two inches to the end with thread; and others tie it together. Thus dreſſed, they exhibit a ſavage and incongruous appearance, which is much heightened by monſtrous decorations, conſiſting of a variety of carved wooden maſks or vizors, applied to the face, the head, or forehead. Theſe groteſque appearances reſemble either human faces, the heads of birds, or thoſe of land and ſea animals. It is not certain what views they have in aſſuming theſe extravagant maſquerade ornaments; poſſibly they may adopt them on particular religious occaſion or for diverſion; or for intimidating their enemies, or as decoys to animals in the chaſe. The only dreſs among the people of Nootka, peculiarly adapted to war, is a thick leathern mantle doubled, which ſeems to be the ſkin of an elk, or buffalo tanned. This forms a kind of coat of mail, or complete defenſive armour. They alſo wear a kind of leathern cloak, covered with rows of dried hoofs of deer, diſpoſed horizontally, appended by leathern thongs and covered with quills, which, when they move, makes a kind of rattling noiſe, almoſt equal to that of many ſmall bells. Theſe people, thus formidable in their appearance when they aſſume their military garb, have not the leaſt appearance of ferocity in their countenances, when diveſted of it; but ſeem to be, in a conſiderable degree, deſtitute of that animation and vivacity, which would render them agreeable as ſocial beings. Such is their diſpoſition that, even in the greateſt paroxyſms of their rage, they ſeem unable to expreſs it ſufficiently, either with warmth of language, or ſignificancy of geſtures.

Although there is too much reaſon, from their bringing to ſale human ſkulls and bones, to infer that they treat their enemies with a degree of brutal cruelty, this circumſtance ſeems to be only an indication of general agreement of character with that of almoſt every tribe of uncivilized men, and furniſhes no juſt occaſion for reproaching them with peculiar inhumanity. They appear to be a docile, virtuous, good-natured people; but notwithſtanding the phlegm of their temper, quick to reſent injury, and as prompt to forgive it. Their other paſſions, and particularly their curioſity, ſeem to lie dormant. Nevertheleſs they are not wholly inſuſceptible of the tender paſſions. In proof of this it is alleged that they are fond of muſic, which is moſtly of the grave or ſerious, but truly pathetic ſort. In their ſongs they keep the exacteſt concert; and they ſing in numbers together. Theſe are generally ſlow and ſolemn, with numerous and expreſſive variations, and a cadence or melody power-

fully ſoothing. Beſides their full concerts, ſonnets of the ſame grave caſt are frequently ſung by ſingle performers, who keep time by ſtriking the hand againſt the thigh. The muſic, however, is ſometimes varied from its predominant ſolemnity of air; and ſtanzas are ſung in a more gay and lively ſtrain, and even with a degree of humour. The only inſtruments of muſic which were obſerved among them were a rattle, and a ſmall whiſtle, about an inch long, incapable of any variation, from having but one hole. The rattles are, for the moſt part, made in the ſhape of a bird, with a few pebbles in the belly; and the tail is the handle.

In traffic, ſome of them betray a knaviſh diſpoſition, and carry off goods without making any return. But in general, ſays Capt. Cook, we had abundant reaſon to commend the fairneſs of their conduct. Such, however, was their eagerneſs to poſſeſs iron and braſs, and, indeed, any kind of metal, that few of them could reſiſt the temptation to ſteal it, whenever an opportunity offered; nor did they pilfer any but that which they could convert to uſeful purpoſes, and had a real value in their eſtimation; ſo that they were thieves in the ſtricteſt ſenſe of the word. Amongſt themſelves, ſtealing is a very common practice, and is the occaſion of many of their quarrels.

In the two towns, or villages, which ſeemed to be the only inhabited parts of the Sound, the number of occupiers amounted to about 2000. The houſes are diſpoſed in ranges, riſing one above the other; the largeſt being in front and the others of ſmaller ſize. Theſe ranges are interrupted or disjoined at irregular diſtances, and they are ſeparated by wider intervals. They are built of very long and broad planks, reſting upon the edges of each other, and faſtened by withes of pine bark. Their height at the ſides and ends is ſeven or eight feet; but the back part is a little higher, ſo that the planks ſlant forward, and thus are kept looſe that they may be put cloſe to exclude rain, or ſeparated for letting in light and diſcharging the ſmoke. Upon the whole, however, they are wretched hovels, conſtructed with little or no ingenuity. Their furniture conſiſts chiefly of a great number of cheſts or boxes, piled upon each other; and containing their ſpare garments, ſkins, maſks, and other things which they chiefly value. Their other domeſtic utenſils are moſtly ſquare and oblong pails or buckets, to hold water and other things, round wooden cups and bowls, and ſmall ſhallow wooden troughs, about two feet long, out of which they eat their food; and baſkets of twigs, bags of matting, &c. Their fiſhing implements and other articles are laid, without order, in other parts of the houſe: their ſleeping benches have nothing but the mats. The naſtineſs and ſtench of their houſes is equal to the confuſion. They rather reſemble hog-ſties than human habitations: every thing within and without ſtinking of fiſh, train-oil, and ſmoke. Many of their houſes, notwithſtanding their diſorder and filth, are decorated with images, formed of trunks of large trees, four or five feet high, ſet up ſingly or by pairs at the upper end of the apartment, with the front carved into a human face, the arms and hands cut out upon the ſides, and variouſly painted; ſo that they are truly monſtrous figures. The general name of theſe images is "Klumma," and in one of the houſes were two others, denominated "Natakkoa," and "Matfeeta." A mat is generally hung before each of theſe images, which the natives are not willing to remove; and when they unveiled them, they ſpoke of them in a very myſterious manner. It is their cuſtom to make offerings to theſe images, and they expect others to do the ſame. Hence it may be inferred, that they are repreſentatives of their gods, or ſymbols of ſome religious or ſuperſtitious object; but Cook ſays, they were held in ſlight eſtimation, as for a ſmall quantity of iron or braſs, he could have purchaſed all the gods (if the images were ſuch) in the place.

The chief employment of the men ſeems to be that of fiſhing, and killing land or ſea animals for the ſuſtenance of their families; and the women occupy themſelves in manufacturing their woollen or flaxen garments, or in preparing the ſardines for drying. The women alſo go in ſmall canoes to gather muſcles and other ſhell-fiſh. The young men ſeemed to be the moſt indolent in this community; for they lay about, baſking themſelves in the ſun, or wallowing in the ſand, like a number of hogs, without any covering. But this diſregard of decency was confined to the men: the women were always clothed, and behaved with the utmoſt propriety. Theſe people ſpend much time in their canoes in the ſummer ſeaſon; eating and ſleeping in them, eſpecially in thoſe of the largeſt ſort, which are much more comfortable habitations than their houſes. Their chief food conſiſts of fiſh, muſcles, ſmaller ſhell-fiſh, and ſea animals. Their moſt common vegetables are two ſorts of liliaceous root, which have a mild ſweetiſh taſte, are mucilaginous, and are eaten raw. Another root reſembles our liquorice, and another a fern-root. They have alſo other roots, which they eat raw. It is their common practice to roaſt or broil their food, for they ſeem to be unacquainted with our method of boiling. They are as filthy in their mode of eating as they are in their perſons and their houſes. The troughs and platters in which they put their food do not ſeem to have been waſhed ſince they were firſt made. Every thing ſolid is torn to pieces with their teeth; and having no idea of cleanlineſs, they eat the roots which they dig from the ground, without ſhaking off the ſoil that adheres to them.

Their weapons are bows and arrows, ſlings, ſpears, ſhort truncheons of bone, and a ſmall pick-axe, like the American tomahawk: which is a ſtone, ſix or eight inches long, pointed at one end, and by the other faſtened into a handle of wood. The handle reſembles the head and neck of the human figure, and the ſtone is fixed in the mouth, ſo as to repreſent an enormouſly large tongue: and to make the reſemblance ſtronger, they affix human hairs to it. That their wars are frequent and bloody is evident, from the number of human ſkulls which they offered for ſale. Their manufactures and mechanic arts are more extenſive and ingenious, both as to deſign and execution, than might have been expected among a people in ſo bad a ſtate of civilization, and of ſo indolent a temper. Their flaxen garments are made of the bark of a pine-tree, beaten into a hempen ſtate. Their woollen garments have the ſtrongeſt reſemblance to woven cloth, though they are unacquainted with the uſe of the loom. The wool is taken from different animals, as the fox and brown lynx. The ornamental figures in theſe different garments are diſpoſed with great taſte, and dyed of different colours. Their fondneſs for carving is manifeſted in every thing that is made of wood. Small whole human figures, repreſentations of birds, fiſh, land and ſea-animals, models of their houſhold utenſils and of their canoes, are found among them in great abundance. They alſo practiſe drawing for various purpoſes. The whole proceſs of their whale-fiſhery is painted on the caps they wear. Their rude performances in this way ſerve to ſhew, that though there be no appearance of the knowledge of letters amongſt them, they have ſome notion of commemorating and repreſenting actions in a permanent manner, independently of what may be recorded in their ſongs and traditions. Their canoes are of a ſimple ſtructure, but well adapted to every uſeful purpoſe. The largeſt, which carry twenty people or more, are formed of one tree. Many



are

are forty feet long, ſeven broad, and about three deep. From the middle, towards each end, they become gradually narrower, the after-part, or ſtern, ending abruptly or perpendicularly, with a ſmall knob on the top; but the fore-part is lengthened out, ſtretching forward and upward, ending in a notched point or prow, conſiderably higher than the ſides of the canoe, which run nearly in a ſtraight line. They are moſtly without ornament; nor have they any ſeats, or ſupporters, on the inſide, beſides ſeveral round ſticks, ſomewhat thicker than a cane, placed acroſs, at mid-depth. They are very light, and by means of their breadth and flatneſs they ſwim firmly, without an outrigger, which none of them have, in which reſpect they differ from thoſe of other countries. Their paddles are ſmall and light, and in managing them they are very dextrous. Their implements for fiſhing and hunting, which are ingeniouſly contrived and well made, are nets, hooks and lines, harpoons, gigs, and an inſtrument like an oar; which laſt is about twenty feet long, four or five inches broad, and about half an inch thick. Each edge, for about two-thirds of its length, the other part being a handle, is ſet with ſharp bone-teeth, about two inches long. Herrings and ſardines, and ſuch other ſmall fiſh as come in ſhoals, are attacked with this inſtrument, which is ſtruck into the ſhoal, and the fiſh are caught either upon or between the teeth. Their hooks are made of bone and wood; and the harpoon, which is excellently contrived, is compoſed of a piece of bone, cut into two barbs, in which is fixed the oval blade of a large muſcle ſhell, in which is the point of the inſtrument. To this is faſtened a rope of about two or three fathoms; and for throwing this harpoon they uſe a ſhaft of about twelve or fifteen feet long, to which the line or rope is attached, and to one end of it the harpoon is fixed, ſo as to ſeparate from the ſhaft, and leave it floating upon the water as a buoy, when the animal darts away with the harpoon. In killing land animals of the ſmaller ſort they uſe arrows, and engage bears, wolves, and foxes with their ſpears. In decoying animals they cover themſelves with a ſkin, and run nimbly about upon all fours, making at the ſame time a kind of noiſe or neighing; and on theſe occaſions, they put on the maſks, or carved heads, as well as the real dried heads, of the different animals. Their ropes are made either from thongs of ſkins and ſinews of animals, or of the flaxen ſubſtance, which is the material of their mantles. The chiſſel and the knife are the only inſtruments of iron which they uſe. Their iron tools are ſharpened upon a whetſtone, and always kept bright. The moſt probable method by which they get their iron is by trading for it with other Indian tribes, who either have immediate communication with European ſettlements upon that continent, or receive it, perhaps, through ſeveral intermediate nations.

Of the political and religious inſtitutions eſtabliſhed among theſe people, we have little information. They have among them ſuch men as chiefs, to whom others of their reſpective families appear to be ſubordinate. Beſides the figures already mentioned, and called "Klumma," they have no other indications of religion. Theſe are moſt probably idols; and are the images of ſome of their anceſtors, whom they venerate as divinities. But they ſeemed to receive from the people no act of religious homage.

Their language is by no means harſh or diſagreeable, any farther than their uſing the *k* and *h* with more force than we do; and upon the whole, it abounds rather with labial and dental than with guttural ſounds. The ſimple ſounds, that are either wholly wanting or rarely uſed, are thoſe repreſented by the letters *b*, *d*, *f*, *g*, *r*, and *v*. But they have one common ſound, which is formed by claſhing the tongue partly againſt the roof of the mouth with conſiderable force, and may be compared to a very coarſe or harſh method of liſping; it may be repreſented by ſuch a compoſition of letters as *lſztdl*. This is one of the moſt uſual terminations of their words. In their language there ſeem to be few prepoſitions or conjunctions, and it is altogether deſtitute of an interjection, to expreſs admiration or ſurprize. Each ſingle ſound comprehends ſeveral ſimple ideas; and the language appears not to be ſufficiently copious.

The latitude of the obſervatory erected by our navigators was 49° 36′ 6″ 47‴ north; and the longitude by lunar obſervations 233 17′ 14″ 0‴ eaſt, and by the time-keeper 235° 46′ 51″ 0‴ according to the Greenwich rate, but according to the Ulietea rate 233° 59 24″ 0‴. The variation of the compaſs at the obſervatory was 15° 49′ 25″ eaſt, and on board the ſhip 19° 44′ 37½″. The mean inclination of the dipping-needle, on ſhore, was 72 32′ 3¼″, and on board 72° 25′ 41½″. On the days of new and full moon it was high water at 12 20ⁿ: and the perpendicular riſe and fall of the day-tide was eight feet nine inches, and the night-tides at the ſame time, *i. e.* two or three days after the full and new moon, roſe near two feet higher. (Cook's Third Voyage, vol. ii.) In 1786, a ſettlement was eſtabliſhed at Nootka ſound by a company of Britiſh merchants reſiding in the Eaſt Indies, under the appellation of the "King George's Sound Company," for carrying on a fur-trade from the weſtern coaſt of America to China; but the ſettlement was ſeized by the Spaniards in 1789. For a further account of the fur-trade at Nootka ſound, &c. ſee FUR-*trade*.

NOOVILLA, a town of Eaſt Florida; 54 miles E.S.E. of St. Mark.

NOOZE, or NOOSE, a name given by ſportſmen to a ſort of horſe-hair ſpringe made to take woodcocks, and very ſucceſsful when the proper precautions are taken. The nooze is made of ſeveral long and ſtrong hairs twiſted together, with a running nooze at one end, and a large knot at the other, which is to be paſſed through the ſlit of a cleft ſtick, to prevent the nooze from being pulled away when the bird is caught in it.

The ſportſman, when he knows his buſineſs, does not ſtay to watch theſe ſnares, but ſets them in the morning, and returns again to them at four in the afternoon, when he ſeldom fails of meeting with a ſufficient number taken. The ſticks are to be about the bigneſs of a man's little finger, and are to be made ſharp at one end, that they may fix the better in the ground: to each of theſe is to be fixed one nooze. The ſportſman is to take out with him ſeveral dozens of theſe bundled up together, and going into the coppice woods, where there lie many leaves upon the ground, he is to ſearch among theſe for the marks of woodcocks frequenting the place; if there come any there, it will ſoon be found out by the leaves, which are ſpread about from ſide to ſide by thoſe birds, in ſearching under them for worms. Their dung alſo, which is of a dark grey colour, being found about the place, is a proof of their frequenting it.

When the place is thus pitched upon, the ſportſman is to take a large circle at ſome diſtance from it, on each ſide, in the way where the woodcocks are ſuppoſed to come to the place; he is here to plant a ſmall hedge-row of ſurze, or other buſhes, of a conſiderable extent, and pretty thick, leaving gaps in it here and there. The woodcocks, in making up to their place of feeding, when they come to this hedge, will run along by the ſide of it, till they come to one of the gaps,

gaps, and then go through, for they hate to take wing, and will run, at any time, a long way under a hedge, rather than fly over it. On this depends the ſucceſs of the ſport.

The noozes are to be fixed one in each of theſe gaps through which it is known the woodcocks will paſs; the ſtick to which it is faſtened is to be ſtuck firmly in the ground, and the nooze to be ſpread wide open on the ground, leaving only ſome dry leaves to ſupport it. The whole gap being occupied by this nooze, the woodcock, when he comes, cannot eaſily eſcape, being taken by the legs in it, and when once caught he will lie till the ſportſman comes. While a ſportſman is walking about a wood in this view, it is very common for him to find ſpringes, or noozes of horſe-hair, fixed at ſix inches high, in ſeveral places. This may be looked on as a proof that there are partridges in the wood, and theſe are the means uſed by the country people to take them. The woodcocks, though in the day they lie in woods, yet, in the night, they go out, and frequent rivers and brooks, and, in the froſty nights, ſuch ſprings as do not freeze are particularly reſorted to by them.

The ſportſman, when he has ſet his noozes in the woods for the day time, ſhould retire to the watery places near them, and ſearch for the marks of theſe birds coming to them by their dung and other tokens. As ſoon as a place is found which they frequent, there muſt be a ſmall hedge-row built there alſo, in the ſame manner as in the woods; and in the gaps, which are to be made at the diſtance of about ſix feet one from another, there are to be placed either the ſame ſort of noozes as thoſe in the woods, or the ſpringes made with hazel-boughs, and the horſe-hair tied to a pack-thread. In either caſe, there is no doubt of ſucceſs, for the birds which have once frequented a place, will come to it every night, as long as they remain any where near it; but particularly if there be any ſpring near a wood, the water not freezing when other waters are iced over, will be ſure to bring the woodcocks together at it, and noozes planted properly about this place will ſeldom fail of ſucceſs. If they have been left a night or two without ſucceſs, the ſportſman is not to deſpair; for though there ſhould happen to be no woodcocks there when they are firſt ſet, theſe birds change place ſo often, that it need not be doubted but ſo proper a rendezvous will be ſoon reſorted to by them.

NOPELN, or CHRISTIANOPOL, in *Geography*, a town of Denmark, in the province of Blekingen; it is fortified, and almoſt ſurrounded by the Baltic; 23 miles N.E. of Carlſcrona.

NOQUET's BAY, a bay of Canada, on the N.W. coaſt of the lake Michigan; 45 miles long and 18 wide. N. lat. 45° 25'. W. long. 86° 20'.

NORA, a town of Sweden, in the province of Weſtmanland; 28 miles N.N.W. of Upſal.

NORADIN, in *Biography*, the ſon of Sanguin, or Emadeddin, ſultan of Aleppo and Nineveh. When his father was ſlain by his eunuchs at the ſiege of Calgembar, in 1145, Noradin and his brother Seifſeddin divided the ſtates between them. The former obtained the ſovereignty of Aleppo, and by his prudence became one of the moſt potent princes in the Eaſt. He diſtinguiſhed himſelf very greatly againſt the Chriſtians in the time of the Cruſades, and defeated Joſcelyn, count of Edeſſa, and Raymond, prince of Antioch, after which he made himſelf maſter of Egypt. He died in 1174. He is characteriſed as a brave and generous prince, and many inſtances are related of his liberality.

NORAGUACHI, in *Geography*, a town of New Mexico, in the province of Cinaloa; 130 miles N E. of Cinaloa.

NORAGUES, a river of Guiana, which runs into the Atlantic, N. lat. 4° 50'. W. long. 53° 6'.

NORAIE, LA, a town of Canada, on the river St. Laurence; 26 miles N.N.E. of Montreal.

NORAMPOUR, a town of Bengal; 15 miles S.E. of Calcutta.

NORANTEA, in *Botany*, a name of intolerable barbariſm, perverted from the Guiana appellation of this tree, *Corono-antegri*, and juſtly rejected by Schreber.—Aubl. Guian. v. 1. 554. t. 220. Juſſ. 245. Lamarck Illuſtr. t. 447. (Aſcium; Schreb. 358. Willd. Sp. Pl. v. 2. 1172.) See ASCIUM and MARCGRAVIA.

NORBA, in *Ancient Geography*, a town of Italy, in Latium, at ſome diſtance to the left of the Appian way. Its ruins are ſtill viſible here, and conſiſt of a wall about five or ſix miles in circuit, gates, towers, and other traces of buildings.

NORBA *Cæſarea* (Alcantara in Eſtramadura), a town of Spain, in Luſitania, ſituated towards the N.W., on the Tagus. Pliny calls it "Norbenſis Colonia," which proves that it was a Roman colony,

NOR-BARKE, in *Geography*, a town of Sweden, in Dalecarlia; 22 miles W.S.W. of Hedemora.

NORBEKITEN, a town of Pruſſia, in the province of Natangen, on the left bank of the Pregel; 48 miles E. of Königſberg.

NORBERG, a town of Sweden, in the province of Weſtmanland, in the vicinity of which are the beſt iron-mines of the province; 34 miles N. of Stroemſholm.

NORBERG, a town of Denmark, in the iſland of Aſſen. N. lat. 55° 3'. E. long. 9° 46'.

NORBERT, in *Biography*, a ſaint in the Roman calendar, and founder of the Premontrè order of Auguſtine monks, deſcended from ſome of the moſt illuſtrious families of Germany, was born at Santen, a village belonging to the duchy of Cleves, in the year 1082. He was educated in the palace of Frederic, archbiſhop of Cologne, and was afterwards called to the court of the emperor Henry V., to whom he was related. Having made choice of the eccleſiaſtical life, he received deacons' and prieſts' orders in the ſame day, and was inſtantly raiſed to honour in the church. Afterwards the emperor created him his almoner, and offered him the biſhopric of Cambray, which he refuſed. He was diſtinguiſhed by a pleaſing perſon, agreeable manners, wit and humour, qualities that led him into company, by whoſe example he was inſenſibly corrupted, and in the end he diſgraced his profeſſion by giving himſelf up to irregularity and vice. At length his former good principles excited the compunctions of conſcience, and he had fortitude to renounce his connections, and to ſet himſelf ſeriouſly to the buſineſs of reformation. He reſigned his different church-preferments, ſold his patrimonial eſtate, and diſtributed the proceeds among the poor. From this period he zealouſly devoted himſelf to the office of preaching, wandering about from city to city, and from country to country, for the purpoſe of combating heretics, and reforming the vicious and profligate. The biſhop of Laon beſtowed on him a ſequeſtered dale, named *Premontrè*, to which he retired in the year 1120, and there founded an inſtitution of canons-regular, which took its title from the name of the ſecluded ſpot in which it was eſtabliſhed. To this place he attracted vaſt crowds by the popularity of his ſermons, and gained many diſciples, who ſubmitted to his code of diſcipline, formed on the regulations of St. Auguſtine, with the ſevere injunction of perpetual

perpetual ſilence, and permiſſion to have only one frugal meal on each day. This order was confirmed in 1126 by pope Honorius II., and in a very ſhort time Norbert ſucceeded in founding eight other monaſteries, which adopted his diſcipline. In the year 1127 the people and clergy of Magdeburg prevailed upon him to accept of the archbiſhopric of their city. In 1131 he was preſent at the council of Rheims, which confirmed the election of pope Innocent II.; and he accompanied the emperor Lotharius to Rome, when he advanced with an army to expel from the ſeat of papal government Anacletus II., the rival of that pontiff. He died at Magdeburg in 1134, when he was only fifty-two years of age. He was placed in the catalogue of ſaints in the year 1584. The only part of his writings that has come down to our times is a ſhort moral diſcourſe, in the form of an exhortation to the monks of his order, which is inſerted in the 21ſt volume of the Bibl. Patrum.

Norbert, a Capuchin friar, famous for his adventures, and his hoſtility to the Jeſuits, was the ſon of a weaver at Bar-le-duc, of the name of Pariſot, where he was born in the year 1697. He embraced the monaſtic life, and after various employments, obtained, about the year 1734, the poſt of attorney-general of the foreign miſſions. In 1736 he went to Pondicherry, and was made a pariſh-prieſt of that city by M. Dupleix, the governor. Here he quarrelled with the Jeſuits, and removed from the Eaſt Indies to America. In different parts of this country he exerciſed the miniſterial functions for a few years, and returned to Rome in 1744. He was now employed in drawing up an account of the religious rites of the Malabar Chriſtians, and that he might not be interrupted by the intrigues of the Jeſuits, he withdrew to Lucca, where he completed his work, under the title of "Hiſtorical Memoirs relative to the Miſſions into the Indies," in two vols. 4to. This work abounds in curious facts, and excited a great ſenſation at its firſt appearance, by diſcovering the means made uſe of by the miſſionaries of the ſociety of Jeſus, in order to increaſe their number of converts. This exaſperated the Jeſuits againſt him, and he was obliged to quit his country; he went firſt to Venice, then to Holland, and afterwards to England, where he eſtabliſhed in the neighbourhood of London two manufactories of tapeſtry. From London he removed to Pruſſia, and from thence into the duchy of Brunſwick. Here he was allowed by the pope to aſſume the habit of a ſecular prieſt. He now aſſumed the name of the abbè Platel, went to France, and from thence to Portugal, where, on account of the perſecutions which he endured, he obtained a penſion. Having completed his great work againſt the Jeſuits, he reviſited France, and committed it to the preſs, in ſix vols. 4to. Afterwards he re-entered the order of the Capuchins at Commercy, but being of a reſtleſs diſpoſition, he ſoon quitted their community, and took up his abode at a village in Lorrain, where he died in 1770, at the age of ſeventy-three.

NORCIA, in *Geography*, a city of Italy, in the duchy of Spoleto, the ſee of a biſhop, ſuffragan of the pope; governed by its own magiſtrates; 18 miles S.E. of Spoleto. N. lat. 42° 37′. E. long. 13° 4′.

NORDBERG, Joran, in *Biography*, was born at Stockholm in the year 1677. Having completed his education at the univerſity of Upſal, he entered into holy orders in 1703, and being appointed chaplain-extraordinary to the artillery, joined the Swediſh army, then encamped before Thorn, and remained with it during the campaigns in Poland and Saxony till the year 1709. In the courſe of that period he formed an acquaintance with the moſt celebrated of the German literati, and was promoted to be firſt chaplain to the royal life-guards, and chaplain to the court. After the battle of Pultowa he was taken priſoner by the Ruſſians, but was permitted to remain in the ſame place with count Piper, the Swediſh miniſter, alſo a captive, whom he accompanied in all the removals which he experienced during his long confinement. In 1715 he was exchanged, and returned to Stockholm; in the following year he repaired to his ſovereign at Stralſund, and afterwards attended him to Scandinavia, and in his expedition to Norway. Towards the cloſe of the year he was appointed to the living of St. Clara and St. Olaus, at Stockholm, and in 1731 was ſelected to compoſe a hiſtory of Charles XII., a taſk which he executed in a very ample manner, partly from facts derived from his own obſervation, and partly from information communicated to him by various perſons who had accompanied the northern hero in his campaigns. This work, after frequent reviſions, was publiſhed at Stockholm in the year 1740, in two volumes folio, and afterwards tranſlated into the German and French languages. The author of it died in 1744. He was always held in great eſteem by his ſovereign, and after his death he enjoyed the favour of the queen Ulrica Eleonora, the king's ſiſter. Beſides his hiſtory, he publiſhed ſome funeral ſermons, of which he wrote a great number.

NORDEN, Frederic Lewis, a naval officer in the Daniſh ſervice, was born at Gluckſtadt, in Holſtein, in the year 1708. He was ſkilled in mathematics, in ſhip-building, and all the branches of agriculture. In 1732 he obtained a penſion to enable him to travel for the purpoſe of ſtudying the conſtruction of ſhips, particularly the galleys and other rowing-veſſels uſed in the Mediterranean. He ſpent about three years in Italy, and Chriſtian VI. being deſirous of obtaining a circumſtantial account of Egypt, Mr. Norden, while at Florence, received an order to extend his travels into that country. He publiſhed an account of his travels into Egypt and Nubia in the year 1756, which were tranſlated into the Engliſh by Dr. Peter Templeman. In the war between England and Spain, Mr. Norden, then a captain in the Daniſh navy, attended count Ulric Adolphus, a ſea-captain, to England; and they went out volunteers under ſir John Norris, and afterwards under ſir Chaloner Ogle. During his reſidence in London, Mr. Norden was made fellow of the Royal Society, and gave the public drawings of ſome ruins and coloſſal ſtatues at Thebes in Egypt, with an account of the ſame in a letter to the Royal Society, in 1741; after this he undertook a tour into France, and died at Paris in 1742.

Norden, in *Geography*, a ſea-port town of Eaſt Frieſland, about three German miles from the ſea, large and commercial, with a good harbour; 15 miles N. of Emden. N. lat. 53° 34′. E. long. 7° 10′.

NORDENBURG, a town of Pruſſia, in the province of Natangen, founded by the Teutonic knights in a lake in 1305; 45 miles S.E. of Königſberg. N. lat. 54° 16′. E. long. 21° 45′.

NORDERNAY, an iſland in the German ocean, near the coaſt of Eaſt Frieſland, about four miles long, and two at its greateſt breadth. N. lat. 53° 40′. E. long. 7° 8′.

NORD FIORD, a bay on the N. coaſt of Iceland, N. lat. 66°. W. long. 17° 46′.

NORDFOE, a lake of Norway, 32 miles in circumference; 50 miles W. of Chriſtiania.

NORDHALBEN, a town of Bavaria, in the biſhopric of Bamberg; 36 miles N.E. of Bamberg. N. lat. 50° 23′. E. long. 11° 37′.

NORDHAUSEN, a city of Germany, ſituated on the Zorge, between the county of Hohenſtein and the lordſhip of Klettenberg, and divided into Old and New; containing ſeven

ſeven Lutheran churches and an orphan-houſe. It carries on a good trade in corn to the Upper Harz, and diſtils great quantities of brandy; it has alſo manufactures of marble and alabaſter, the materials of which are brought from Stollberg and Hohenſtein. It was a free imperial city from its foundation. In 1802 it was given among the indemnities to the king of Pruſſia, and in 1807 it was annexed to Weſtphalia, 38 miles N. of Erfurt. N. lat. 51° 28′. E. long. 10° 56′.

NORDHEIM, a town of Weſtphalia, in the province of Calenberg, ſeated on the Ruhme, which, ſeparating into two branches, runs into the Leine. It has one pariſh-church, a grammar-ſchool, and ſome manufactories. Albert the Great raiſed it into a town in 1252; 10 miles N. of Gottingen. N. lat. 51° 40′. E. long. 9° 57′.—Alſo, a town of the duchy of Wurzburg; 7 miles N. of Biſchoffsheim.

NORDINGEN, a town of Sweden, in Angermanland; 21 miles N.N.E. of Hernoſand.

NORDKIOPING, a town of Sweden, in the province of Eaſt Gothland, on the river Motala, founded in 980. It is next in extent to Stockholm, a ſtaple town, and formerly fortified; it contains five churches, and about 10,000 inhabitants; its trade is conſiderable, and it has a new and commodious quay. It has two copper-mills, a hammer-mill for braſs, ſeveral paper-mills, fifty corn-mills, woollen manufactures, a ſalmon-fiſhery, &c.; 76 miles S.W. of Stockholm. N. lat. 50° 36′. E. long. 16° 4′.

NORDKIRCHEN, a town of Germany, in the biſhopric of Munſter; 6 miles N. of Werne.

NORDLAND, a province of Sweden, bounded on the N. by Lapland, on the E. by the gulf of Bothnia, on the S. by Proper Sweden, on the W. by Norway, lying between 60 and 67½° N. lat. It is a rocky and mountainous province, diverſified with foreſts, verdant vallies, lakes, and rivers. It abounds with timber and veniſon; but has only a ſmall portion fit for tillage. This province has, beſides timber, ſeveral rich mines, forges, hammer-mills, and other works for metal. Its lakes and rivers ſupply plenty of fiſh, and cattle in great number are bred in the country. It abounds with flights of wild geeſe. Beyond Upland bees are ſcarce. Some ſcattered tracts of land are inhabited by Finlanders. It is divided into ſeven provinces, and is ſuppoſed to contain 95,000 ſquare miles, and 150,000 inhabitants, including the natives of Lapland. The provinces are, Gaſtrickland, Helſingland, Medelpad, Jemptland, Harjedalia, Angermannia, and Weſtro-Bothnia.

NORD-LIBRE, (Condé), a town of France, in the department of the North, and chief place of a canton, in the diſtrict of Douay. The place contains 5978, and the canton 13,621 inhabitants, on a territory of 87½ kiliometres, in 10 communes.

NORDLINGEN, a city of Bavaria, ſituated in a fertile country on the Eger, with abundant paſturage. Until the year 1802, it was free and imperial, when it was given, among other indemnities, to the elector of Bavaria. The burghers are almoſt wholly Lutherans, who have three churches; but the Roman Catholics alſo have a place in which they celebrate their worſhip. The magiſtracy is compoſed of Lutherans. In 1796 it was taken by the French; 30 miles N.N.W. of Augſburg. N. lat. 48° 49′. E. long. 10° 31′.

NORDMALING, a ſea-port town of Sweden, in the province of Angermanland, ſituated in a bay of the gulf of Bothnia. N. lat. 63° 34′. E. long. 19° 24′.

NORDMARSCH, a ſmall iſland of Denmark, in the North ſea; 3 miles N.W. of Nordſtrand.

NORDORF, or Nordtorp, a town of the duchy of Holſtein; 13 miles S.W. of Kiel.

NORDRE Rönnerne, a cluſter of iſlets and rocks in the Cattegat, about four miles from the N.W. coaſt of the iſland of Leſſoe. N. lat. 57° 22′. E. long. 10° 55′.

NORDSTRAND, an iſland of Denmark, in the North ſea, near the coaſt of Sleſwick. The ſea has often inundated it, and in 1634, the impetuoſity of the waves ſwept away 6408 perſons, 1332 houſes, 30 wind-mills, 6 churches, and 50,000 head of cattle; and a great part of the iſland was deſtroyed. It formerly contained 22 pariſhes, and abounded in corn and cattle; but now only one pariſh remains. N. lat. 54° 37′. E. long. 8° 48′.

NORE, a river of Ireland, which riſes at the ſouthern part of the Slieve Bloom mountains, in the Queen's county, very near the riſe of the Suire. After making a ſweep to the eaſtward, it takes a S.S.E. direction through the Queen's county and that of Kilkenny, paſſing the city of Kilkenny and the towns of Thomeſtown and Iniſtioge, and joining the Barrow, which riſes in the northern part of the ſame mountains, a little to the north of New Roſs.—Alſo, a noted place in the river Thames, E. of the iſland of Grain, on which is a light fixed and a floating veſſel. N. lat. 57° 27′. E. long. 0° 44′.

Nore, *Black*, a cape of England, on the coaſt of Somerſetſhire, in the mouth of the Severn; 5 miles S.W. from the mouth of the Avon.

NOREGNA, a town of Spain, in Aſturias; 8 miles N.N.E. of Oviedo.

NORENBERG, a town of Germany, in the New Mark of Brandenburg; 21 miles E.N.E. of Stargard. N. lat. 53° 27′. E. long. 15° 33′.

NORES, Jason de, in *Biography*, a man of letters of the 16th century, was born at Nicoſia, in the iſle of Cyprus. In his youth he ſtudied at Padua, where he graduated. On his return to Cyprus, hearing of the death of his friend, Trifon Gabrielli, a learned man, whoſe houſe he had frequented at Padua, he put into Latin the Commentaries on Horace's Art of Poetry, which he had taken from the mouth of Trifon, and publiſhed them at Venice, with the addition of a brief compendium of Cicero's De Oratore. When Cyprus fell into the hands of the Turks in 1570, De Nores retired to Venice, with the loſs of all his property, and lived there ſome years, probably ſupported by the liberality of ſome of the nobles. In 1577 he was appointed by thoſe of his own nation to plead in their behalf before the doge, and not only obtained for them a ſettlement in the city of Pola, with many privileges, but procured for himſelf an appointment to the chair of moral philoſophy at Padua. In this ſituation he wrote the greater part of his works, and continued to exerciſe his profeſſional charge till his death, in the year 1590. The ſubjects of his ſeveral works are philoſophical, coſmographical, political, and rhetorical. They diſplay much learning, and are written in a good ſtyle. Moreri.

NORFOLK, in *Geography*, a county of England, ſituated on the eaſtern ſide of the iſland, and ſurrounded by the following counties and waters, *viz.* the German ocean, or North ſea, on the north and eaſt, Suffolk on the ſouth, and the county of Cambridge on the weſt. The area thus encloſed is nearly of a circular form, and diſplays almoſt a flat ſurface: *i. e.* it has no prominent hills nor deep vallies. It is ſo ſurrounded by its marine and river boundary, that it may be conſidered almoſt an iſland, being connected with the adjacent land to the ſouth ſolely by a narrow cauſeway, raiſed through the marſhes, near Lopham. The longeſt diameter is in the direction of eaſt to weſt, from Yarmouth to Wiſbeach

beach; and the conjugate diameter, north and ſouth, from Wells to Billingford. Templeman eſtimates the former to be fifty-ſeven miles, and the latter thirty-five. He alſo ſtates the contents to be 1426 ſquare geographical miles; but Mr. Kent, whoſe ſkill and accuracy in ſurveying appears preferable, ſtates, in his "General View of the Agriculture of Norfolk," the greateſt length to be fifty-nine miles, and the greateſt breadth to be thirty-eight, compriſing an area of 1710 ſquare miles, and 1,094,400 ſtatute acres. Mr. Young, not being ſatisfied with this ſtatement, had the lateſt ſurvey of the county carefully meaſured; the reſult of which meaſurement gives 1830 ſquare miles for ſuperficies, and this countenances Mr. Howlett's opinion, that Norfolk is larger than Eſſex, which is eſtimated to contain 1,240,000 ſtatute acres.

Norfolk is divided into thirty-three hundreds, containing one city, four ſea-ports, twenty-five other market-towns, and ſeven hundred and fifty-ſix pariſhes; a greater number than any other county in the kingdom.

*Climate, &c.*—From the ſituation of the county, parts of it being expoſed to the ocean, and others to a large extent of marſh-land, the air is extremely cold in winter, and at the early part of ſpring. North and north-eaſterly winds, it has been obſerved, are more prevalent here than in any other part of the kingdom. Theſe are ſeverely felt, and vegetation is conſequently backward. The contiguity to the ſea and the marſhes, with the vapours brought from Holland, accounts for the frequent rains during the ſummer months; at which ſeaſon, ſtorms of thunder, lightning, and tornadoes, are not unuſual, though they are ſeldom of ſo long duration as in more hilly diſtricts. Mr. Young conſiders the temperature as rather affecting animal than vegetable life; but there does not appear any juſt ground for the diſtinction. The vital principle, whatever it may be, is evidently homogeneous throughout nature; and whatever operates upon that will produce ſalutiferous or deleterious effects upon vegetables as well as animals, though different in degree, and unequal in importance. Whoever has viſited this county in the ſpring, and has previouſly examined the operations of nature in the midland diſtricts, will be ſurpriſed at the backward appearance of the crops, and at the ſight of nature dwindling under the apparent influence of even a genial ſun. In the hundred of Marſhland, and other fenny parts of the county, the air is not only cold, but exceedingly damp; and the inhabitants are ſubject to intermitting fevers. Theſe are endemial, ſo that ſtrangers, on their firſt reſidence, are generally attacked with agues; on which occaſion they are proverbially ſaid to be "arreſted by the bailiff of Marſhland." The county to the north and north-weſt of Thetford, forming the greater part of Norfolk, conſiſting of a ſandy or gravelly ſoil, is peculiarly ſalubrious and pleaſant.

*Surface, general Appearance, and Soil of the County.*—The face of Norfolk may be conſidered as leſs varied in its features than that of any tract of country of equal extent in the kingdom. In the northern parts, the general ſurface is ſomewhat broken into moderate elevations and depreſſions; where turf-clad hills and fertile vallies are diverſified by woods, coppices, hedge-rows, and other enlivening ſylvan decorations. The cottages and ſmall farm-houſes are many of them of wattle and dab, or lath and plaſter, and covered with thatch; there are ſome, however, neatly built of brick, and roofed with ſlate or pantile. Numerous good houſes of opulent yeomen, and the ſeats of the nobility and gentry, adorn many parts of the county. The ſurface, Mr. Kent obſerves, except about Norwich, and on the coaſt near Sherringham and Cromer, is chiefly a dead flat, the aſpect uniform; and, as the moſt intereſting parts lie to the ſouth-weſt, where ſtrangers generally enter the county, it muſt offer to them a dreary and forbidding appearance. The entrance from the ſouth, by way of Colcheſter, however, brings the traveller into a fine rich country, towards the north and north-eaſt; and theſe parts being encloſed, well cultivated, and abounding with timber, more than moſt maritime diſtricts, exhibit a variety of cheerful ſcenes and pleaſing views. "As to the ſoil," obſerves Fuller, "here are fens and heaths, light and deep ſand and clay-grounds, meadow-lands, and paſtures and arable, wood-lands, and woodleſs." Mr. Kent divides the county into five parts as to ſoil. Firſt, the diſtrict to the north and north-eaſt of Norwich, compriſing the hundreds of Eaſt and Weſt Flegg, South Walſham, Bloſield, Wapping, Tunſtead, and the greateſt part of North and South Erpingham, which conſiſts of a ſandy loam, "equal in value to the beſt part of the Auſtrian Netherlands, to which it is ſimilar." Second, the diſtrict to the ſouth and ſouth-eaſt of Norwich, including the hundreds of Loddon, Clavering, Henſtead, Earſham, Diſs, Deepwade, and Humbleyard, and ſome parts of Forehoe and Mitford, conſiſts of ſtiff wet land, compoſed of a mixture of ſand and clay, and abounds with ſprings. Third, the diſtrict containing the largeſt part of the county, and lying to the weſt and north-weſt of Norwich, compriſes the hundreds of Taverham, Eynsford, Holt, North Greenhoe, Gallow, Launditch, Brothercroſs, Smithdon, Freebridge, and Clackcloſe. This is what generally goes by the name of Weſt Norfolk, and conſiſts principally of light ſandy land, and "is a very inferior country to the two preceding diſtricts." The fourth diſtrict, lying ſouth-weſt of Norwich, compriſes the hundreds of Shropham, Guilcroſs, Weyland, South Greenhoe, and Grimſhoe, conſiſts of a light ſand; ſo light, indeed, in the latter hundred, that it frequently drifts in the wind, and is bare of vegetation. Marſhland may be conſidered a fifth diſtrict by itſelf, conſiſting of ooze formed by depoſition from the ſea. To this may be added a narrow tract of ſimilar land on the eaſtern part of the coaſt near the mouth of the rivers Yare and Waveney. This extends a conſiderable diſtance up the county towards Norwich; the whole of which, in winter, is generally under water, and in the ſpring it is expedient to drain it for the purpoſes of depaſturing. There are alſo large tracts of ſwampy ground in the vicinity of Lodham, frequently inundated by land floods, and producing little but ſedge and reeds. In the ſouth-weſt part of the county is an extenſive tract of land, which cannot claſs with either of Mr. Kent's diviſions, being eſſentially different from them all. It forms part of that immenſe fenny diſtrict, which extends out of this county into thoſe of Cambridge, Northampton, and Huntingdon, alſo into Suffolk and Lincolnſhire.

The ſoils of this county are deſcribed by Arthur Young in the following table, which ſpecifies the number of ſquare miles and acres occupied by each.

| | Square Miles. | Acres. |
|---|---|---|
| Light ſand | 220 | 140,800 |
| Good ſand | 420 | 268,800 |
| Marſhland clay | 60 | 38,400 |
| Various loams | 900 | 576,000 |
| Rich loam | 148 | 94,720 |
| Peat | 82 | 52,480 |

*Woods and Plantations.*—Norfolk, by ſome writers, has been deſcribed as a well wooded county; and by others as almoſt wholly deſtitute of that intereſting veſture: both opinions have proceeded from a ſuperficial or partial view of the diſtrict. In ſome parts the hedge-rows abound with numerous

numerous trees, which, at a diſtance, by aggregation, give an idea of extenſive woods; and in others the great expanſe of heath and unincloſed lands, ſtript of every timber tree, exhibit a drearineſs which, unrelieved by ſylvan ſcenery, tends to impreſs the mind with the idea that Vertumnus, as well as Pomona, have neglected or refuſed to take this diſtrict under their protection. There are, however, numerous woods, but they are partially ſcattered through the county. The principal are thoſe of Foxley, in the hundred of Eynsford; ſome to the weſtward of Wymondham, in Forehoe; Shotteſham, in Henſtead; Aſhwellthorpe, Hampnell, and Bunwell, in Deepwade; Hethel, Hetherſel, and Hetteringham, in Humbleyard. A laudable ſpirit has prevailed of late among the proprietors of large eſtates to plant, not merely for embelliſhment, but for uſe. Extenſive plantations of timber trees have been made in many parts, but more particularly in the north-weſtern.

*Coaſts, Rivers, Canals, Roads, &c.*—The coaſt of Norfolk varies conſiderably in its outline and ſubſtance from the ſouth and weſtern ſhores of the iſland. No deep indented bays, nor ſinuous creeks interſect the land, nor beetling rocks and bold impending crags here form an adamantine barrier to the aſſailing waves: and though a continuation of that great bed of chalk, which, commencing in the high cliffs of Dorſetſhire, paſſes through the kingdom, and terminates here, yet it forms on this part of the coaſt no proud elevations nor conſpicuous heights. The ſhores are generally flat. In the vicinity of Cromer is a ſmall bay, where ſome bold headlands preſent themſelves: and ſome wooded hills make a little variety in the neighbourhood of Sherringham. Excluſive of theſe, which are on a ſmall ſcale, Hunſtanton-cliff, commonly denominated St. Edmund's Point, from king Edmund having landed there when he took poſſeſſion of Eaſt Anglia, may be conſidered as the only rocky prominence of much note on the coaſt. The other eminences conſiſt of clay, and are conſtantly becoming a prey to the depredations of the ocean. Much of the coaſt is compriſed of a low ſandy beach, covered with gravel and looſe pebbles, here called ſhingles; which, by the violence of the waves, are frequently thrown up in immenſe heaps. Theſe, by the continual accumulations of ſand, are formed into banks, which are kept together by the matted roots of what is called *ſea-reed graſs*. Numerous banks of this kind lie off the coaſt far out at ſea; and being only diſcoverable at ebb or quarter tides, they are juſtly the dread of mariners, and frequently prove fatal to coaſting veſſels. Of theſe, the moſt remarkable is the large bank running parallel with the coaſt off Yarmouth, between which and the ſhore is a deep channel, where veſſels ride ſafely during tempeſtuous weather. This is known by the name of Yarmouth Roads.

The ranges of ſand-hills on this, like thoſe on the oppoſite coaſts of Holland, tend to preſerve a valuable portion of country from continual inundation. A line of theſe, called the Meals, or Marum Hills, commences at Caiſter, two miles north of Yarmouth, and extends, with occaſional interruptions, to Happiſbury Point, where two light-houſes have lately been erected, and thence to Cromer Bay, where what are called the Mud Cliffs begin, and line the northern ſhore to Lynn Regis. Theſe ſand-banks are not all permanent; they ſometimes ſhift their ſtation by a ſub-marine route. Suddenly they diſappear, and as ſuddenly riſe up in a new ſhape at ſome diſtant point, a curious inſtance of which happened on the coaſt near Yarmouth about two centuries ago; which will be noticed in a ſubſequent account of Yarmouth.

The principal rivers of Norfolk are the Great Ouſe, the Little Ouſe, the Waveney, the Bure, the Wenſum, the Yare, and the Nar. The Great Ouſe, or Ouze, riſes near Brackley, in Northamptonſhire, and having been previouſly joined by the Lark, the Cam, and the Little Ouſe, enters this county to the ſouth-weſt of Downham; paſſes under Stow, Magdalen and German bridges, and then, joined by the Nar from the eaſtward, empties its waters, after a courſe of nearly ſixty miles, into the bay called by Ptolemy Metaris-Æſtuarium, two miles below the harbour of Lynn Regis; where the trade of that port exhibits a crowd of veſſels on its eſtuary, called Lynn-Deeps. The tide flowed up this river many miles further formerly; it now being checked by ſluices, erected near Denver for the purpoſes of drainage and navigation. This river "is remarkable for its extraordinary ſwell or overflowings at the two equinoxes, and eſpecially at the full moon of the autumnal one; when a vaſt heap of waters from the ſea comes in upon it, with every thing in its way, and the very water-fowl ſhun it." It is navigable twenty-four miles above Lynn for barges through this county, and for ſmall boats as far as Bedford; thus forming a communication by means of other collateral rivers and canals with ſeven of the midland counties.

The Little Ouſe, or, as in ſome deeds it is denominated, Brandon river, riſes in a ſwampy meadow near the village of Lopham, in the ſouthern part of this county; and, taking its courſe weſterly by Ruſhford, receives a ſmall ſtream from Ixworth. It is joined by the Thet at Thetford, whence, meandering through a ſandy ſoil, it paſſes under Brandon bridge, and ſtealing along with ſolemn pace through the unintereſting level of the fens is then "wedded," as Drayton calls it, to the Greater Ouſe at Littleport, on the borders of Cambridgeſhire. The Little Ouſe is navigable up to Thetford.

The Waveney alſo takes its riſe at Lopham. It is ſomewhat ſingular, that though the Little Ouſe and the Waveney have their ſources in the ſame tract of ſwampy ground, and near each other, they immediately take oppoſite directions in their courſe to the ſea; the one running due weſt, and the other almoſt directly eaſt. The Waveney is navigable for barges from Yarmouth, to Bungay bridge in Suffolk.

The Bure riſes near Heldolweſton, on the north ſide of the county, and, taking its courſe by Blickling, becomes navigable at Ayleſham. After receiving ſome tributary ſtreams, and flowing under Wroxham bridge, it paſſes the ſcite of St. Bennet's abbey, where it receives the Ant. A little further it is joined by the Thone, flowing from a lake near North Waliham; then paſſing under Acle bridge, and increaſed by the ſuperfluous waters of the marſhes, it joins the Yare, on the northern ſide of Yarmouth.

The Wenſum riſes near Weſt Rudham in this county, and being joined by numerous ſmall rivulets in its progreſs, it paſſes the city of Norwich, part of which it environs. At Trowſe it meets the Taſs, or Taſe, and near Burgh is joined by the Waveney; about two miles weſt of Yarmouth it merges into the Yare.

The Yare is ſuppoſed to riſe near Attleborough, and taking a north-eaſterly courſe joins the Wenſum to the eaſt of Norwich.

The Nar, called alſo Seeky and Seecky river, has its ſource at Litcham, paſſes Caſtle-Acre to Narborough, thence flowing under Seeky bridge, falls into the Great Ouſe near Lynn Regis. It is navigable from the latter as far as Narborough, an extent of about fifteen miles.

The Nene is no otherwiſe connected with Norfolk than ſerving to form part of the weſtern boundary between this county and that of Lincoln.

Moſt

Moſt of theſe rivers riſe in marſhy lands, and, running through a comparatively level country, the fall is conſequently ſmall, and their pace ſlow; ſo that they contribute to keep the adjacent grounds in a ſwampy ſtate, and to fill the atmoſphere with denſe vapours. Swelled by land-floods above, and their mouths commonly choaked by ſilt, thrown up by the violence of the tide below, they often overflow the low lands, and in their courſe form numerous, ſmall, ſhallow lakes or pools, which are provincially termed *Broads* and *Meers*. Theſe are plentifully ſtocked with fiſh, and much frequented by water-fowls. The principal of them are in that diſtrict through which the Bure, the Wenſum, and the Waveney have their courſe. Breedon, or Breydon-Broad, to the ſouth of Yarmouth, is three miles in length, and one mile and a half in breadth. Hickling-Broad is nearly three miles in length, and about one wide. That of Rockland is one mile and a half long, and half a mile wide. In the vicinity of theſe are ſeveral others of ſmaller extent, and of irregular dimenſions. There are others at Quidenham, Diſs, and Hingham. In the fenny diſtricts many temporary ones are formed during the winter ſeaſons, in the neighbourhood of which are numerous decoys for catching wild fowl.

*Canals.*—With reſpect to inland navigation, little more has yet been done in this county than widening and cleanſing the beds of the natural rivers, and rendering them ſubſervient to the purpoſes of internal conveyance. Much has been accompliſhed for a ſituation ſo circumſtanced as Norfolk, and much more remains to exerciſe the ingenuity, and call forth the public ſpirit of the people. A canal has been completed from Wiſbeach in Cambridgeſhire, to Outwell creek, and Salter's Load in Norfolk, an extent of about ſix miles, to render the navigation of the river Nene more effectual. A few years ago a propoſition was brought forward, and met with conſiderable ſupport, for making the river Wenſum navigable from Norwich to Fakenham: but the difficulties attending the plan, and the expences likely to be incurred in its execution, appeared to preponderate over the probable advantages to be derived from it by thoſe parts of the country through which the line was propoſed to extend. Had the ſcheme been carried into execution, it would have added, ſays Mr. Colhoun, more conſiderable advantage to the county of Norfolk than ariſes from any of the river navigations before enumerated. There are ſeveral ſmall cuts from the navigable rivers to private eſtates for the purpoſes of carrying corn to the markets, and freighting back manure for the improvement of lands.

*Roads*—From the nature of the various ſoils, the roads of Norfolk might be expected to be bad; but the reverſe of this is generally the caſe. By a comparative ſtatement, according to Mr. Kent, they "are better in their natural ſtate in this than in almoſt any other county." At the time king Charles II. paid a viſit to the carl of Yarmouth at Oxnead, in the year 1671, when roads had not been improved by the aid of tolls, he is ſaid to have remarked, "that Norfolk ought to be cut out in ſtrips to make roads for the reſt of the kingdom." Except in the marſhes and fens, the roads are free from ſloughs and deep ruts; and though the ſuperſtratum is chiefly ſand, yet it reſiſts the preſſure of carriage-wheels, a little beneath the ſurface: and the plentiful ſupply of gravel afforded in almoſt every part facilitates their repair at a moderate expence. Although this county claims the credit of having made the firſt road, in compliance with the Turnpike Act; yet, ſince that period, moſt other counties have ſurpaſſed it in ſuch kind of improvements. The number of turnpike roads in the county is ſaid to be ſeventeen, including an extent of about two hundred and fifty miles. Beſides theſe, there are many public ways, thirty and forty feet wide, which are equally commodious for travelling, without the interruption and expence of toll-bars; having mile-ſtones and finger-poſts erected upon them for the direction of travellers. Some of theſe are kept in order by parochial rates, and others are repaired by private gentlemen.

*Natural Hiſtory, Productions, &c.*—The natural hiſtory of this county has hitherto been much neglected or withheld from the public. Some reſearches have lately been made by a gentleman eminently qualified for ſuch enquiries; the reſult of which, it is hoped, will ſhortly be preſented to the world.

The native cow, a ſmall animal, with ſhort turned-up horns, "approaching to the Alderney," is generally of a red colour; not a good milcher, but hardy, and calculated for barren paſtures. "Great part of this county is known to have been, within the ſpace of a century, a wild, bleak, unproductive diſtrict; comparatively ſpeaking, at leaſt half of it was rabbit warrens and ſheep-walks. The ſheep were as natural to the ſoil as the rabbits, being hardy in their nature, and of an agile conſtruction, ſo as to move over a great ſpace with little labour." Among the farmers this breed of ſheep is called *Norfolks*. It is a hardy horned animal, with a black noſe, and feet of the ſame colour; carries a fleece of nearly two pounds; and, when fatted, weighs about eighteen pounds *per* quarter.

The pig of this diſtrict is comparatively a ſmall, thin, briſtled breed; very prolific, and the fleſh eſteemed ſavoury. The people of this county have an excellent mode of curing hams and cheeks; but the practice of feeding hogs for bacon is very ſeldom adopted here. The quantity of ſwine has been diminiſhed by the decline of dairy farms, and the incloſure of the waſte lands.

Poultry of all kinds are plentiful, and of a ſuperior quality. Owing to the dryneſs of the ſoil, in the ſandy and loamy diſtricts, and the range afforded by the unincloſed parts, turkies are numerous; and the modes of feeding them produces a delicacy of flavour which has ſtamped a kind of impoſing pre-eminence on every bird which bears the name of a Norfolk turkey. The conſumption of theſe is very conſiderable, both in this and the adjacent counties; and yet ſuch is the abundance, that immenſe quantities are ſent to the moſt diſtant parts of the kingdom. It has been computed, that more turkies are bred in this and the adjoining county of Suffolk, than in the whole kingdom beſides. They are commonly driven on foot to London, and to other diſtant places. During one ſeaſon, upwards of three hundred of theſe flocks, of ſome hundreds each, have been noticed to paſs Stratford-bridge, on the river Stour, in their way to the metropolis; beſides what proceeded by different routes to the ſame market.

Norfolk furniſhes large ſupplies of geeſe, which are bred in the fenny parts of the county. The dealers have taught theſe awkward birds to travel on foot as well as turkies; and prodigious numbers of them are ſent annually to London from the neighbourhood of Downham, Wiſbeach, and Lynn. The driving of theſe to market commences about the beginning of Auguſt, when the harveſt being generally houſed, the ſtubbles furniſh proviſions on the road, where they feed during the night. Turkey-polts, goſlings, chickens, &c. uſed to be conveyed by light caravans; but now they are principally ſent by the ſtage coaches. Of ſuch animals as are feræ naturæ, the rabbit claims the precedence; becauſe it is made an object of trade to a conſiderable extent in this county. Theſe profitable little animals are here extremely numerous; occaſioned not only by their natural

fecundity, which is proverbial, but alſo by the congeniality of the ſoil with their peculiar habits. So prolific are they, that it is with difficulty, in ſome places, that they are kept from increaſing to an alarming extent, as anciently they did, according to Pliny, in the Balearic iſles: numbers breed about Caſtle-Riſing, Thetford, Winterton, and Sherringham; but Methwold-heath is a celebrated place for the fineſt and beſt flavoured. This ſpot was noticed as a rabbit-warren ſo early as the reign of king Canute, A. D. 1016.

What is denominated *game* is very plentiful in this county. Hares, pheaſants, and partridges are very abundant, and are protected with great jealouſy and care by the noblemen and gentlemen of Norfolk. Theſe are noted ſportſmen, and where ſo much game prevails, there are alſo many poachers. Hence proſecutions on the Game Laws are very frequent in this county.

The meers and marſhes of Norfolk are alſo much frequented by woodcocks, widgeon, teal, ducks, and other aquatic fowl. But among the curious birds, either reſidents or occaſional viſitors of Norfolk, that which moſt deſerves notice, becauſe now almoſt become a total ſtranger to the iſland, is the otis tardi, or great buſtard. It is the largeſt of the Britiſh land-fowl; the male bird on an average weighing, according to Pennant, twenty-five pounds, and expands his wings nine feet in breadth; its length is about four. He uſually inhabits the heath-lands and moors. They appear occaſionally to the northward, in the wold of Yorkſhire, and ſouthward on Saliſbury Plain, in Wiltſhire, and on the downs of Dorſetſhire. Some are found on the weſtern ſide of this county. They are very ſhy birds, avoiding the haunts of men; and, though powerful on the wing, they ſeldom fly far without reſting, and are never known to wander above twenty or thirty miles from the ſpot where they were firſt fledged.

The *ſtrix otus curtatus*, or ſhort-eared, long-winged owl, is an occaſional viſitant of this county. This ſingular bird is generally fond of uninhabited places, has been obſerved to frequent the hill of Hay, and other elevated ſpots in the Orkney iſles. It does not, like others of the ſame tribe, alight on trees; but lies under long graſs or ſtubble, where it ſits looking compoſedly at the perſon who attempts to diſturb him. Like the hawk, he flies to ſeek his food by day. He is a bird of paſſage, and migrates about the ſame time as the woodcock, travelling northwards towards the Shetland iſles, and thence to Norway.

The *corvus cornix*, or hooded crow, commonly called the Royſton crow, from the number which frequent the vicinity of the town of that name in Cambridgeſhire, is frequently an unwelcome viſitant of the marſhes. This ſpecies is more injurious than any other of the genus.

That ſingular and proteus-like ſpecies of the ſand-piper, the *tringa pugnax*, is found in this county. The males are called *ruffs*, and the females *reeves*; both are diſtinguiſhed by a tuft of feathers on the back of their necks, by which they may be diſcriminated from all other birds.

Environed by a great extent of ſea-coaſt, abounding in rivers and ſtreams, accompanied by numerous broads and meers, Norfolk is well ſupplied with freſh and ſalt-water fiſh. The Bure, and its attendant broads, abound with various kinds; ſuch as pike, tench, trout, perch, &c. The latter are, indeed, ſo plentiful at times, that the inhabitants at Ranworth report they have witneſſed a hundred and twenty buſhels having been, by two nets, caught in one day. In the Yare, or in the Wenſum, are found a ſingular ſpecies of perch, the *perca cornua*, called a *ruffe*; which Dr. Caius has Latinized into *aſpredo*. It is ſmaller and more ſlender than the common perch, and ſeldom exceeds ſix inches in length. Two great piſcatory concerns are carried on along the coaſt and the ſand-banks in the North ſea, the *mackerel* and the *herring* fiſheries. The mackerel, a gregarious and migratory fiſh, appear in vaſt ſhoals on this coaſt in the ſpring and ſummer, and during the ſeaſon furniſh an abundant ſupply of food to the inhabitants, &c. at a very moderate expence. But the herring-fiſhery is the moſt important and moſt profitable purſuit. It commences in September, and continues about three months; at which time vaſt quantities are caught, cured by pickling or drying, and exported to diſtant places. Of this fiſhery ſome account will be given in the ſubſequent hiſtory of Yarmouth.

*Minerals, Foſſils, &c.*—Few parts of the kingdom are ſo devoid of ſubterraneous treaſures as Norfolk. No mineral or foſſil ſubſtances have been found ſufficient to excite a mining ſpirit; no veins of that invaluable ſubſtance, coal; nor any extent of ſtratification of uſeful ſtone. The ſubſtrata of the county, as far as reſearches have diſcovered, conſiſt of clunch, chalk, in which flints are imbedded, gault, gravel, ſand, ſilt, and peat earth. On Mouſehold-heath, and in ſome other places, there is an expanſive ſubſtratum of clunch, or indurated chalk, which is uſed for walls, and burnt for lime. It appears to have been formerly applied in buildings, particularly for coignes, mullions, and tracery of windows; and for ſepulchral ornaments, and other works of ſculpture, anterior to the general uſe of alabaſter and marble. The chalk-pits in the vicinity of Norwich abound with thoſe large beautiful black flints which compoſe the walls of many buildings in that city; and the deep pits on Mouſehold-heath are probably the places whence they were dug. In the gault, or argillaceous ſtrata, has been found a clay which manufactures into an excellent kind of earthen-ware. Brick-clay abounds in various places, and, with ſand, forms bricks of equal quality to thoſe made in the neighbourhood of the metropolis. The ſilt, or ſea-ſand, finely pulverized, which is found at various depths, is uſed for repairing the roads. Through the whole of the fen lands, the peat earth furniſhes the poor people with an abundant ſupply of fuel.

On the ſhore near Thornham, at low water, is the appearance of a large foreſt having been at ſome period interred and ſwallowed up by the waves. Stools of numerous large timber trees, and many trunks, are to be ſeen, but ſo rotten, that they may be penetrated by the ſpade. Theſe lie in a black maſs of vegetable fibres, conſiſting of decayed branches, leaves, ruſhes, flags, &c. The extent of this once ſylvan tract muſt have been great from what is diſcoverable; and at high water, now covered by the tides, is in one ſpot from five to ſix hundred acres. No hint of the manner or the time in which this ſubmerſion happened can be traced. Nothing like a bog is near, and the whole beach beſides is compoſed of a fine ooze, or marine clay.

*Agriculture, artificial Productions, &c.*—The agriculture of Norfolk is in a highly reſpectable ſtate; and when the nature of the ſoil, and the condition of the country about 50 years ago, be taken into a comparative account, the ability and induſtry for which the huſbandmen of this diſtrict have been ſo long famed, will be juſtly acknowledged.

The firſt thing that attracts the eye of the ſtranger in Norfolk is the fine *tilth* of the ſoil, and the ſucceſſion of crops. The mode of cultivating the arable lands is worthy of general imitation, wherever it can be adopted. The plough, which is of an admirable conſtruction, is drawn by two horſes harneſſed abreaſt; and theſe are guided by the perſon who holds the plough. Inſtead of working the animals ſeven or eight hours, without drawing the bit, as is the cuſtom in ſome

ſome counties, "they are here worked eight hours in winter, and ten in ſummer, by two journies, as they are termed, which enables them to do conſiderably more than they would by one journey." The ploughings are repeated till the land is in high tilth, when it is completely pulverized with drags and harrows, which are violently drawn, by the horſes being kept on a trotting pace. The ridiculous cuſtom of letting the land lie idle one year in every three, for the advantage of what is termed *fallowing*, is here very properly exploded. The neceſſity of it is ſuperſeded, and the reaſons for it done away, by a judicious courſe of cropping; ſo that one crop may fertilize, as another exhauſts. The mode of cropping, in general practice, is what is termed a *ſix courſe ſhift*, *viz.* firſt year, wheat; ſecond, barley, with or without clover; third, turnips; fourth, barley or oats, with or without clover; fifth, clover mown for hay; ſixth, grazed and ploughed up for wheat again. The average crops of the whole county may be ſtated at three quarters of wheat, and four of barley, and other articles in proportion, *per* acre.

Oats are ſown only as a ſhifting crop, and there are ſeldom more raiſed than what are conſumed within the county. Other crops are rye, buck-wheat, peas, beans, vetches, or tares, cole-ſeed, clovers, rye and other artificial graſſes; burnet, cocksfoot, chickery, cabbages, mangel-wurzel, lucerne, carrots, and potatoes. Among what are termed *irregular* crops may be reckoned *muſtard*, which is much cultivated between March and Wiſbeach. Saffron is alſo grown in the ſouth-weſtern diſtrict, and in ſome parts adjacent to Cambridgeſhire. Flax is cultivated in the vicinity of Downham, and near Outwell. Hemp is alſo grown near Old Buckenham, Diſs, Harleſton, &c. but not in ſuch abundance as might be expected.

Butter is made here in conſiderable quantities, and exported under the name of *Cambridge* butter. The prevailing ſyſtem being arable, the graſs lands of Norfolk have been too generally neglected: but by the late practice of marling, they are now greatly improved; and by the adoption of under-draining and irrigation, the grazing land is experiencing very conſiderable advantages.

*Of particular Improvements, &c.*—The part of huſbandry in which Norfolk ſtands pre-eminent, and which has led to eſtabliſhed excellence, is the management of its turnip crops. This valuable winter root was only cultivated in gardens, as a culinary plant, in this country, till the reign of George I., when viſcount Townſhend, who had attended the king to Hanover as ſecretary of ſtate, obſerving the profit and utility of the field cultivation of turnips in that electorate, on his return brought with him the ſeed, and recommended it to his tenants in Norfolk, who occupied land of a ſimilar quality to that of Hanover. The experiment ſucceeded equal to expectation, and the practice gradually ſpread over the county, and made its way into ſeveral other parts of the kingdom. This important root has been progreſſively riſing to its preſent ſtate for upwards of 70 years. "A good acre of turnips in Norfolk will produce between 30 and 40 cart-loads, as heavy as three horſes can draw; and an acre will fatten a Scotch bullock from 40 to 50 ſtone, or eight ſheep. But the advantage of this crop ends not here; for it generally leaves the land ſo clean, and in ſuch fine condition, that it almoſt inſures a good crop of barley, and kind plant of clover; and the clover is a moſt excellent preparative for wheat, ſo that, in the ſubſequent advantages, the value of the turnip can ſcarcely be eſtimated."

No county has exhibited a greater variety and number of implements for facilitating the operations of huſbandry than Norfolk, nor evinced more readineſs in applying them to practice. Among wheel-carriages, the non-deſcript one, called a *wizzard*, or *hermaphrodite*, is curious. It is the common cart, to which, in harveſt, or under preſſing circumſtances, a couple of temporary fore-wheels are placed under the ſhafts, and two oblique ladders to the frame, by which it is made to anſwer the purpoſe of a waggon: "and in ſmall farms it is a real object of utility; and in large ones, of great aſſiſtance in a buſy ſeaſon." Drills are of all kinds, but a drill-roller is perhaps peculiar to this county. It is a large caſt-iron cylinder, with projecting rings round it, at about ten inches diſtance from each other. This being drawn over the ploughed land, makes indentations, and the ſeed ſown broad-caſt, chiefly falls into the drills, and is thus more regularly and better depoſited than in the common mode of ſowing.

The powers of ſteam were firſt applied to the purpoſes of agriculture in this county, and the firſt ſteam-engine was ſet up by colonel Buller of Haydon. It poſſeſſes the power of ten horſes; turns a large threſhing machine, a corn-mill, a chaff-cutter, and performs at the ſame time ſeveral other labours of manual huſbandry. On Mr. Coke's farm an improvement on temporary fencing has been adopted, worthy of univerſal imitation. It is the application of moveable gates and poſts with hurdles, for partially eating off turnips, or depaſturing graſs lands. Regaining land from the ſea has, in ſeveral inſtances, been ſucceſsfully practiſed. At Tichwell, 300 acres were embanked in the year 1786: in 1790, 868 acres were embanked and encloſed in the pariſhes of Terrington St. Clement, and Terrington St. John. But the chief improvement of this kind, which has hitherto been made, was performed in Marſhland by count Bentinck, who, in the proſecution of his plan, loſt his life. His ſon has, however, continued to purſue it, and perſeverance has crowned him with ample ſucceſs. The count's embankment extends about four miles in length.

*Ancient Hiſtory and Antiquities of the County.*—Anterior to the Roman colonization of Britain, the diſtrict now called Norfolk, with the contiguous country, was peopled by a tribe of Britons called Iceni, and another claſs denominated Cenomanni, or Cenimagni. According to Whitaker, (Hiſtory of Mancheſter, vol. i. 62. 149.) the latter occupied Caſtor, near Norwich, as their venta, or chief city. Theſe, as well as the Trinobantes, who were placed to the ſouth of the former, were repeatedly aſſailed, and often ſubdued by the Romans; and the latter being ultimately conquered, the whole eſtabliſhed ſeveral military poſts, or ſtations, in this diſtrict, as permanent habitations for themſelves, and to overawe the conquered natives. Five of theſe ſtations were formed and garriſoned within the limits of this county, or in its immediate vicinity, *viz.* Branudonum, Garianonum, Venta-Icenorum, Sitomagus, and Ad-Tuam; beſides which, ſeveral ſubordinate, Caſtra-Æſtiva, and Stativa-Hiberna, were alſo formed. Of the latter kind, according to ſome writers, were Buxton, Caſtor near Yarmouth, Buckenham, Caſtle-Acre, and Elham. At theſe places have been diſcovered ſeveral coins, urns, and other remains of that people. Theſe and other fortifications, intended to intimidate the Britons, as well as to repel invaſion, were placed under the ſupreme command of an officer, whoſe title, agreeably to ſome authors, was "Comes tractus maritimi;" and others have it "Comes litoris Saxonici," *i e.* Count of the Saxon ſhore. Under his controul the ſtations on the eaſt ſide of the iſland were placed, the garriſons of which are ſtated to have conſiſted of 2200 infantry, and 200 cavalry. Theſe numbers are ſet down in the Notitia, which was written in the reign of the younger Theodoſius, about the year 410. But as this allowance of troops was inadequate for the defence of each ſtation, and conſequently inſufficient

to

to ſubdue inſurrection, it is probable that to the Romans were joined Britiſh conſcript troops, not included in this enumeration; as we find that, about 20 years after, the imperial armies in this country were compriſed chiefly of Britiſh auxiliaries, which, together with the few remaining Roman troops, were recalled to defend the Roman capital by Maximus and Conſtantine.

The firſt Saxon leader who eſtabliſhed himſelf in this part of the iſland was Uffa, who, A.D. 575, aſſumed dominion over that part of the country which at preſent compriſes Norfolk, Suffolk, and Cambridgeſhire, giving it the appellation of Eaſt Anglia; and the inhabitants were denominated Uffagines. About this period it is highly probable that the city of Norwich aroſe out of the Venta-Icenorum of the Britons and Romans; and, from its relative bearing to the old city, was called by the Saxons North-ick, or Northwick.

Uffa, who died A.D. 578, was ſucceeded by his ſon Titiſt, on whoſe demiſe, 599, his ſon Redwald aſſumed the reins of government, and embraced Chriſtianity; but, through the influence of his wife, renounced it again He was ſucceeded, A.D. 624, by his ſon Erwald, who was aſſaſſinated by a relation, named Richbert, A.D. 633. His half-brother Sigebert, or Sigbercht, ſucceeded to the crown, in whoſe reign the biſhopric of Dunwich in Suffolk was eſtabliſhed, and the firſt ceremony for religious inſtruction formed, which led to the eſtabliſhment of an univerſity at Cambridge. Fatigued with the burthen of government, he reſigned both his crown and its cares, A.D. 644, to his kinſman Egric. The Saxon governments were now at variance amongſt themſelves. Penda, king of Mercia, commenced hoſtilities againſt Egric, who called Sigebert from his monaſtic retirement to head his army. They were defeated, and both ſlain in battle. Anna, nephew of Redwald, aſcended the throne, reſtored Cenwalch to his kingdom of Weſſex, and became the moſt celebrated of the Eaſt-Anglian princes. But Penda bringing againſt him the powerful reſources of Mercia, he fell in battle, A.D. 654. From this period, the Mercian princes ſeem to have dictated in the choice of monarchs to the Eaſt-Angles; and in the year 792, Offa, king of Mercia, united the kingdom of Eaſt-Anglia with his own; and ſubſequently it became ſucceſſively ſubject to the power of Mercia, or of Kent. After the whole Saxon kingdoms had been united under one monarchy, the Danes made occaſional deſcents on this coaſt. They firſt came under the command of Hungar and Hubba, in the year 870, and landed their troops near Redeham, oppoſite the town of Yarmouth. They ſoon became formidable, and, previous to the death of Egbert, they poſſeſſed the whole of Eaſt Anglia. On the demiſe of that monarch, Ethelwolf obtained the crown of England. He was totally unequal to the taſk of ſucceeding ſo puiſſant a prince as his father, at this momentous criſis. The Danes proved too powerful and ſubtle for his military knowledge and ſtrength. In numerous engagements they routed and defeated his armies. He died in the year 857, and was ſucceeded by Ethelbald his ſon, who died A.D. 860, when his eldeſt brother aſſumed the government. Ethelred, the third brother, came to the throne in 866. In his reign, the Danes extended their ravages over the greateſt part of his dominions; but under the martial ſpirit and proweſs of his younger brother, Alfred, then inveſted with the title and authority of earl and field-marſhal, they received a ſevere check; and by the continued reverſes they experienced, were conſtrained to abandon Eaſt Anglia entirely, and concentrate their forces in Weſſex, where ſeveral deſperate battles were fought with various ſucceſs, in one of which Ethelred was mortally wounded; and dying in 872, Alfred aſcended the throne, and ultimately ſucceeded in conquering the Danes. He compelled the chieftains and their followers to receive Chriſtian baptiſm, and allotted the province of Eaſt Anglia for their limited reſidence. Here the Danes became domeſticated: they built houſes, and improved the lands, were admitted to the privileges of Engliſhmen, and received a code of laws for their regulation from Alfred. The Daniſh chief had fixed his ſeat of viceroyalty ſometimes at Cambridge, and ſometimes at Norwich; but after this ſignal defeat, and conſequent reſtriction, the principal reſidence of theſe marauders was the latter city. From that period, Norwich continued a royal caſtle, and the county remained, with the other parts of the province, in poſſeſſion of the Saxon line, through the ſucceeding reigns of Athelſtan, Edmund, Edred or Eldred, Edwin or Edwy, Edgar, and Edward the Martyr. In the reign of Ethelred II., the Danes again became extremely troubleſome, and, A.D. 992, invaded with conſiderable force Eaſt-Anglia, and proceeding as far as London, inveſted that city. To revenge this outrage, Sweyne, king of Denmark, aſſembled a numerous army, and with a powerful fleet invaded England; and landing on the coaſt of Norfolk, burnt the cities of Norwich and Thetford, and was proceeding to devaſtate every part of the country. During the whole of the Daniſh dynaſty, this county was the theatre of many ſevere conflicts; and as the Daniſh chiefs prevailed, they either took poſſeſſion for themſelves, or for ſome leader, of a ſtrong fortreſs or town.

In the time of William Rufus Norfolk was a ſcene of confuſion, in conſequence of Roger Bigod having confederated with Robert Curthoſe againſt the king, in which conteſt the county ſuffered very conſiderable devaſtation. During the commotions excited in the kingdom by the unnatural attempt of prince Henry to wreſt the crown from the head of his father king Henry II., this county largely participated in the diſaſters which ariſe from civil diſcord. Earl Bigod eſpouſed the prince's cauſe, but the king's troops being victorious, the Flemings in the pay of the prince were permitted to return to their own country, and Bigod purchaſed his peace at the expence of 1000 marks.

In the turbulent reign of John, Roger Bigod, earl of Norfolk, took part with the refractory barons. And while they were taking towns and cities in one part of the kingdom, John was laying waſte with fire and ſword the baronial poſſeſſions in another. In this career he came to Lynn, where, being well received, he croſſed the waſhes, with the loſs of his baggage, to the abbey of Swineſhead, in his way to Newark caſtle, where he died. After this period, the county was overrun by prince Lewis, who exacted heavy contributions. In Richard II.'s time, a powerful inſurrection broke out, under two brothers, John and Matthew Tiler, commonly called Jack Straw and Wat Tiler, whoſe ſtandards were joined by numbers of the lower claſſes, and Norwich was inveſted by the rebels collected under one Lileſter. But he being taken and arraigned for treaſon, was condemned to be hanged, drawn, and quartered; one portion of his body to be ſuſpended at his own houſe, one in the city of Norwich, one at Lynn, and another at Yarmouth; this ſo diſpirited his adherents, that they diſperſed, and an end was put to the rebellion of the Norfolk levellers. Two rebellions broke out in the reign of Edward VI. owing to a ſyſtem of encloſing adopted by the nobility and gentry, who had been put in poſſeſſion of the abbey lands. Though they happened in remote parts, Norfolk and Devon, the coincidence of theſe ſhew that they were the conſequence of previous communications, and a preconcerted plan. The rebels

rebels having imbibed the ſpirit of the ancient levellers, aboliſhing diſtinction of ranks, they proceeded to execute their nefarious deſigns under two ring-leaders, of the names of Ket. They fixed their grand rendezvous on Mouſehold-heath, near Norwich. Here the elder, Robert Ket, with aſſiſtant deputies from every hundred, held his councils under a large tree, ſtyled the Oak of Reformation, from which he pretended to adminiſter juſtice, and iſſued his edicts for contributions. Long did the country labour under the exactions and other acts of outrage committed by this banditti; all attempts to quell the inſurrection having been ineffectual, till a large army, raiſed to proceed againſt the Scots, was ſent againſt the inſurgents, under the command of the earl of Warwick, when Robert Ket was taken, and the rebels diſperſed. At the commencement of the unhappy diſſentions which aroſe between Charles I. and his diſaffected ſubjects, Norfolk took a deciſive part. When the parliament had voted the neceſſity of taking up arms July 12th, 1642, the inhabitants of this county generally approved of that determination. At an early period of the conteſt, Norwich was fortified againſt the royal party. Norfolk formed one of the aſſociated counties placed under the command of the earl of Mancheſter; the others were Suffolk, Cambridge, Hertford, and Eſſex, to which Lincoln was afterwards added. In 1643, a tax was levied by parliament for the uſe of its army, to be paid by weekly inſtallments. This county contributed 1250*l.*

*Encampments, Roman Roads, &c.*—It is evident that Norfolk muſt have been the region of many battles, and have been alternately occupied by warriors of different nations and parties. In proportion to the power and ſkill of theſe, would be the fortifications they conſtructed; and as the latter were deſtroyed, or injured, they would be enlarged and altered by ſucceſſive poſſeſſors. In addition to the five Roman ſtations already mentioned, ſome writers have conſidered Ichborough, north of Brandon, as a ſixth; and have identified it as the Iciani of the Itinerary. Roman coins, and other veſtiges, have been found in various parts of the county, particularly at Brompton, Buckenham, and at Thetford, but theſe furniſh no deciſive proof that ſuch places have either been occupied by the Romans as ſtationary or as exploratory camps.

At South Creak, in the north part of the county, where a deſperate battle was fought between the Anglo-Saxons and the Danes, are veſtiges of a circular encampment, which ſtill retains the name of Blood-gate. Near Weeting are the remains of another, conſiſting of a vallum and foſs, known by the name of the Foſs. Near it are places of ſepulture, called "Grimes Graves." At Narborough is a ſmall circular fort, ſaid to have been occupied, if not thrown up, by the Danes, when they landed on this part of the coaſt, A.D. 1003.

Beſides the military fortifications in the county, ſeveral of the old halls were formerly encompaſſed with moats, and their entrances protected by towers, ſtrong doors, bridges, &c. Remains of ſome of theſe features are ſtill preſerved in Oxborough-hall, Stifkey-hall, Caſtor-caſtle, Baconſthorpe-hall, Hunſtanton-hall, Gaywood, Scales-hall, Finchamhall, &c.

Of the viæ militares, or great Roman roads, made for the convenience of carriages, and facilitating the marching of the army, few perfect veſtiges remain in Norfolk. But as ſeveral important ſtations were formed within the county, no doubt can be entertained that ſuch roads once exiſted, though the traces of moſt of them are now obliterated. It was the cuſtom of the Romans to open this kind of communication between all their ſtations, and many appearances of ſuch are ſtill to be ſeen in thoſe parts of the adjoining county of Cambridge which abut upon this; and in a direction as if they had come from the eaſtern part. A great Roman road connected the ſouth-eaſtern and north-weſtern parts of the kingdom; and another formed a ſimilar communication between the north-eaſtern and the ſouth-weſtern extremities. This commencing on the coaſt of Norfolk, probably at Burg, near Yarmouth, paſſed by Caſtor, and is now conſpicuous near Downham; croſſing the river Ouſe, it paſſes through the fens into Cambridgeſhire, and proceeding through the central counties, joins the Julia-ſtrata, and terminates at St. David's Head. Sir William Dugdale ſays it was diſcovered in the fens ſixty feet wide, and three feet deep, and formed of compact gravel. Its direction was from Downham in Norfolk, through Plaitfield and Charke to the high grounds about March; then it proceeded by Eldon-hall to Wittleſea and Peterborough, from which laſt place it has recently been traced to Caſtor in Northamptonſhire.

Of the chimini minores, or vicinal roads, ſome traces are ſtill viſible. What is called Pedders-way, paſſing from Thetford by Ichborough, Swaffham, Caſtle-Acre, Fring, Ringſhead, to the ſea near Brancaſter, appears one of this ſort. The road leading by Long-Stratton to Taſburg was probably another, whilſt a third branched off from this to the north-weſt, going through Marſhland, Upwell, and Elm, to Wiſbeach. What is called the *Milky-way* has been conſidered Roman; but it is more probable of later date, and was poſſibly made for the convenience of the devotees who went on a pilgrimage to the chapel of our Lady of Walſingham. It is traceable in ſeveral places, and is pretty perfect in the vicinity of Grimes-Graves.

Several barrows or tumuli are to be found in different parts of the county, particularly in the neighbourhood of Creek, Amnor, Rudham, Sedgeford, Stifkey, Long-Stratton, Weeting, Norwich, and Walſingham. In ſome, which have been opened, different relics have been diſcovered, as human bones, wood-aſhes, and urns made of baked clay. Theſe were ſometimes encompaſſed with large ſtones, forming a ſort of cell or kiſtvaen; and in ſome of the barrows have been diſcovered miſſile inſtruments, with implements, which are conſidered by ſome antiquaries to have been originally employed in ſacrifice.

On Mouſehold-heath, near Norwich, are many excavations in the earth, which Mr. King and ſome other antiquaries have called hiding pits, or Britiſh caves. Several of ſimilar character are to be ſeen on the downs of Wiltſhire and Dorſetſhire.

*Eccleſiaſtical Hiſtory and Juriſdiction of the Dioceſe.*—Soon after the ſettlement of the Saxons in Eaſt Anglia, the Chriſtian religion was introduced into this part of the iſland; and it is related that Sigebert, ſon of Roderic, king of the Eaſt Angles, was the firſt to eſtabliſh it here. He had been baniſhed, by his eldeſt brother Erpenwald, into France, where he contracted an intimacy with a religious Burgundian, named Felix, who prevailed on him to adopt the Chriſtian faith. On the death of Erpenwald, Sigebert returned to Britain, and ſucceeded his brother as king of Eaſt Anglia. His predilection, after his converſion, increaſed towards Felix, who had accompanied him from France. He firſt made him chaplain and confeſſor, and then encouraged him to undertake the converſion of his ſubjects. Upon this arduous taſk, ſo congenial to his mind, Felix cheerfully entered. Charmed by the impreſſive eloquence of the evangeliſt, and incited by the royal example, numerous converts were ſoon made; ſchools were inſtituted and churches erected for public worſhip. Over theſe Felix was appointed to

preſide under the title of biſhop, and after having been conſecrated by Honorius, archbiſhop of Canterbury, A.D. 630, he fixed his ſeat at Siltheſtow, afterwards called Dunwich, in the county of Suffolk. Such were his piety and zeal, and ſo extenſive was the fame which he acquired by his eminent ſervices in the church, that after his death, which happened in the year 647, he was canonized as a ſaint, and his feſtival, which was annually kept, ſtands on the eighth of March in the Romiſh calendar.

Thomas, who had been deacon to Felix, ſucceeded him. In his declining years, infirm and unable to perform the duties of his dioceſe, he obtained permiſſion to divide the biſhopric into two ſees, fixing one at Dunwich in Suffolk, and the other at North Elmham in Norfolk. Subſequent to this partition of the Eaſt Anglian dioceſe, the biſhops of North Elmham were as follows.

1. Bedwinus, Baldwinus, or Beadwine, was conſecrated 673, and aſſiſted Acea, in 675, to place the veil upon St. Oſſyth.

2. Northbertus, Northbert, or Rothbert, ſucceeded Bedwinus ſome time after the year 679.

3. Hedulacus, Haduac, or Hatholac, was biſhop of this ſee at the time Bede completed his Eccleſiaſtical Hiſtory, in A.D. 731.

4. Edelfridus, Ethelfrith, or Ethelferth, ſucceeded, and

5. Lamferthus, or Lameferd, followed; but at what time is not ſatisfactorily aſcertained.

6. Athelwalfus, or Æthelwolph, occupied the ſee in 811.

7. Unfertus, Alberth, or Alcar, was biſhop, according to Blomefield, about the year 787.

8. Sibba, Sibban, or Siga, ſat in the year 816.

9. Hunferth, Hunferd, or Hufred, was conſecrated by Wilfred, archbiſhop of Canterbury, and was living in the year 824.

10. Humbert, or Humbret, was conſecrated about 826.

11. Wybred, Wyred, or Wildred, was appointed biſhop of both the ſees of Norfolk and Suffolk.

*Biſhops of Elmham after the Union of the Sees.*—1. Theodred I., or Tedred, is reported to have been an eye-witneſs of St. Edmund's corpſe being found uncorrupt. A.D. 945.

2. Theodred II., ſurnamed the Good, was firſt biſhop of London, and then of Elmham, both of which he held until his death, ſome time after A.D. 962.

3. Athulf, Adulf, or Eadulf, has been erroneouſly placed as ſitting prior to the Theodreds in this ſee.

4. Alfric, Alfrid, or Ailfric, was one of the number who ſigned the charter of king Edgar to the abbey of Croyland, in the county of Lincoln. He died at the end of Edgar's reign in 975.

5. Athelſtane, Edelſtane, or Elſtane, was conſecrated at the end of the ſame year.

6. St. Algare, or Algane, who had been confeſſor to Dunſtan, archbiſhop of Canterbury, was promoted to this ſee in the year 1012. Died Chriſtmas eve, A.D. 1021.

7. Alfwin, Elfwin, or Eldwin, ſucceeded the ſame year. He reſigned, or died, A.D. 1031.

8. Alfric II., Ailfric, or Aluric, ſucceeded and died A.D. 1038.

9. Alfric III., ſurnamed the Little, who had previouſly been prior of Ely, died A.D. 1139.

10. Stigand, who was chaplain to king Harold Harefoot having obtained this ſee by ſimony, was ejected by king Hardicanute 1040.

11. Grimketel, or Grumketel, held it in commendam with the biſhopric of the South Saxons, during the remainder of Hardicanute's reign.

12. Egelmar, or Almar, on the advancement of his brother Stigand, ſucceeded in the year 1067.

13. Herfaſt, or Arfaſt, chaplain to William the Conqueror, was made biſhop at Eaſter, 1070.

A liſt of the biſhops of Norwich will be given in a ſubſequent account of that city.

*Extent, Juriſdiction, Revenues, and Liberties of the Dioceſe.*—The dioceſe of Norwich compriſes the counties of Norfolk and Suffolk, except four peculiars in the latter county; three of which belong to the ſee of Canterbury, *viz.* Hadleigh, Monk's Illich, and Moulton; and Frekenham to the ſee of Rocheſter. It includes alſo fifteen or ſixteen pariſhes in Cambridgeſhire. Spelman ſays, the dioceſe contains 1121 pariſhes, and Beatſon, in his Political Index, repeats the ſame enumeration; but this, if meant of unconſolidated livings, muſt be very erroneous, as, A.D. 1371, biſhop Henry Spenſer certified to the king, that there were in his dioceſe 1321 pariſhes. And if meant to include pluralities as pariſhes, it will then be far from accurate. Various changes have, however, taken place in this reſpect, and the number is occaſionally fluctuating from different cauſes. The number of eſtabliſhed clergy reſident in the dioceſe, according to a calculation made in the year 1772, was beneficed clergy 550, curates 150, from which it is evident there muſt be a number of pluralities. Mr. Young remarks, that not half the clergymen reſide at their livings.

An anſwer returned to a mandamus of queen Elizabeth, by biſhop Parker in 1563, ſtates, that "the dioceſe contains Norfolk and Suffolk, except four peculiars and eleven churches in Cambridgeſhire, beſides churches void, chapels, and donatives. Thus in the archdeaconries:"

| | Deaneries. | Rectories. | Vicarages. | Void Churches. |
|---|---|---|---|---|
| Norwich | 12 | 168 | 41 | 80 |
| Norfolk | 12 | 184 | 36 | uncertain. |
| Suffolk | 13 | 114 | 42 | —— |
| Sudbury | 8 | 182 | 31 | —— |

The preſent enumeration from the beſt information that can be obtained is 1354, *viz.* 802 in Norfolk, 537 in Suffolk, and 15 in Cambridgeſhire. Formerly there was but one archdeaconry, that of Norfolk. Sudbury was added in the year 1126, Suffolk in 1127, and Norwich in 1200; thoſe are ſubdivided into 47 deaneries, and theſe, as apportioned to each archdeaconry, are as follows, with the number of pariſhes contained in each:

| Archdeaconries. | Deaconries. | Pariſhes. |
|---|---|---|
| Norwich | 13 | 365 |
| Norfolk | 12 | 468 |
| Sudbury | 8 | 523 |
| Suffolk | 14 | |

The dioceſe is in the province of Canterbury, and the biſhop is a ſuffragan to that metropolitan. The juriſdiction of the ſee, as reſpects its internal regulations, is veſted in the biſhop, who appoints the four archdeacons as his aſſiſtants, (no ſuffragans having been choſen ſince the time of biſhop Nix) a chancellor, a regiſtrar, and other officers of his conſiſtorial court.

*Revenues.*—Nurtured by kings, and long under the foſtering care of royalty, this dioceſe rapidly increaſed in wealth, ſo that at the time of the great Norman ſurvey the revenues of it were very conſiderable, as appears from the enumeration of them in Domeſday book. Subſequent to that era, the biſhops of Norwich were generally in the court favour; and

and as favourites were preferred to the higheſt ſtations of emoluments and truſt, the ſee often gained ſome acquiſition of wealth from ſucceeding prelates. In the Conqueror's inqueſt, there is an account taken of twenty-ſeven manors belonging to this ſee, beſides advowſons, fee-farm rents, &c. Biſhop Beaufo died poſſeſſed of forty-three manors, many of which, at his death, were by his will annexed to the epiſcopal poſſeſſions. Hence it appears, that at the time Herfaſt came to it, the ſee was ſeiſed, on a moderate computation, of ſixty manors; and the pipe rolls of king John's reign evince, that biſhop John de Grey, in 1212, anſwered for thirty-five knights' fees; and in the following year obtained a *quietus*, or writ of acquittance, from the Scotch ſcutage, for forty-eight knights' fees and three quarters. And although by a multiplicity of changes from the varied complexion of the times, and the political character of the prelates, theſe were frequently diminiſhed, yet by the act paſſed February 4th, 1535, which veſted the revenues of the dioceſe in the power of the king, it appears that the biſhop poſſeſſed twenty-three manors, ſeventy-three livings, ten palaces, all the knights' fees of the barony, and the firſt fruits of the whole dioceſe, what no archbiſhop ever poſſeſſed; excluſive of all other epiſcopal ſources of emolument. By virtue of that act, the whole of theſe were alienated for ever from the ſee, except a few preſentations, and the palace of Norwich. In lieu of them, to give a kind of colouring to the glaring acts of rapacity, the comparatively ſmall revenues of Holme abbey were granted to the biſhop; and the nefarious tranſaction was gloſſed over under the name of an *exchange*. Some few additions were made in the reigns of king Edward VI., and queen Elizabeth. The biſhopric ſtands charged at preſent in the king's books at 834*l.* 11*s.* 7*d.* It pays firſt-fruits but no tenths, thoſe having been diſcharged by a commutation with queen Elizabeth for the epiſcopal manors of Sudborne and Swanton. The preſent clear yearly value is uncertain, but on the average it is computed to amount to about three thouſand five hundred pounds *per annum*.

*Liberties*.—At an early period this ſee enjoyed extenſive privileges as well as great revenues. To enumerate them would fill ſeveral pages. The biſhop poſſeſſed all the uſual powers granted to lay baronies, the liberty of coinage, exemption from all taxes, tallage, and cuſtoms, except thoſe of the city of London, jura regalia, within his manors, a coroner, and a priſon for his liberty, and all mulcts, amerciaments from his tenants; the right of chooſing a juſtice for the precinct of his palace, and of acting himſelf as one of the king's juſtices of the peace for the city, county, and liberty. All theſe were confirmed by a charter of *inſpeximus*, granted by king Henry VIII. March 29, A.D. 1512. But through many ancient ſtatutes becoming obſolete, the abolition of feudal cuſtoms, and various ſubſequent parliamentary regulations, many of theſe privileges are abridged if not diſannulled. There is, however, one which the biſhops of Norwich have exerciſed time immemorial, and as it is peculiar to this dioceſe ought not to be omitted. It is the power of uniting any two cures within the dioceſe, at the time of inſtitution, without regard to their value, and that either by perſonal or perpetual union. The perſonal union laſts only during the life of an incumbent, and anſwers to an archiepiſcopal diſpenſation, requiring in this dioceſe only the biſhop's conſent. The perpetual union is made with the joint conſent of patron, incumbent, and biſhop, and is equal to a conſolidation. The biſhop is a peer of the realm, and ſits in the upper houſe, not only in right of his barony, but as titular abbot of St. Bennet's in Holme; and is the only abbot at preſent in England.

*Abbies, Priories, and other religious Houſes*.—From the preceding account of the prelacy of this ſee, it appears that the Chriſtian religion loſt much of its intrinſic excellence by its connection with ſecular intereſts, and to what a prodigious height of power, wealth, and grandeur, the church had ariſen prior to the reformation. In the account of the monaſtic inſtitutions, this will appear ſtill more evident, and the abuſes which followed ſuch unwarrantable acquiſitions, will be diſplayed in a more prominent degree.

Norfolk teemed with religious houſes; out of one thouſand one hundred and forty-eight monaſteries ſeized by Henry VIII. after his denial of the papal ſupremacy, ſeventy-nine religious or charitable foundations were ſuppreſſed in this county.

Norfolk contained ſeveral alien priories, which were diſſolved before the general ſuppreſſion, and a few decayed hoſpitals, whoſe revenues had been ſequeſtered and appropriated to other uſes.

*Ancient Architecture*.—From the various circumſtances already mentioned, it may with great probability be inferred, that Norfolk contains various and numerous ſpecimens of eccleſiaſtical architecture; and from the many military tranſactions which occurred within this diſtrict, the antiquary may expect to meet with ſeveral caſtellated remains. Norfolk contains the following caſtles, the chief of which were built or materially altered by the firſt Norman barons. Norwich caſtle at preſent merely conſiſts of part of the large ſquare keep in the upper ballium, ſtanding on a lofty conical hill, and ſurrounded by a deep and wide foſs.

*Caſtle Acre*.—The fortifications of this place are extenſive and bold. Parts of the wall of the circular keep and ſome other fragments remain.

*Caſtle Riſing*.—This caſtle diſplays features very diſſimilar to either of the former, and totally different to the generality of fortifications.

At *Middleton*, near Lynn, is a fine gatehouſe or entrance to a caſtellated ſtructure. Caiſtor-hall, near Yarmouth; Oxborough-hall, near Stoke; Winwall-houſe, near Stoke; Stiſkey-hall, near Walſingham, and Baconſthorpe-hall; are ancient manſions, all of which exhibit ſome features of a caſtellated character, though they do not appear to have been regularly and completely fortified.

In the claſs of *Eccleſiaſtical Architecture*, Norfolk preſents more curious and ancient than what may be termed *fine* buildings. Of thoſe old churches, towers, &c. which are commonly called Saxon and Daniſh, many ſpecimens are to be found in this county; and it would be highly gratifying to laudable curioſity to aſcertain whether they were really erected by either the Saxons or the Danes, during their alternate dominion in Eaſt Anglia.

The round towers, of which ſeveral ſtill remain in Norfolk and Suffolk, have been called Daniſh by ſir James Burrough and by ſome other antiquaries; and their being found principally in this part of the iſland ſtrengthens that opinion. Though of a circular form, they are diſſimilar in ſize and height to the pillar towers of Ireland, and are ſtill more unlike the circular churches. The architecture, if their conſtruction be entitled to this term, is very ſimple or rude; they conſiſt of a plain wall of flint, rubbiſh, ſtone and mortar, with very ſmall openings or windows in them. The latter are towards the top, and have ſemicircular heads divided into two apertures, with a column between. The pariſh church of Bexwell near Downham, and that of Bychamwell near Swaffham, have round towers. Beſides the acknowledged high antiquity of that form, there is in each a circumſtance certainly not common: both have been ſurmounted by octagon tops about the age of Henry VII. In that of Bex-

well are ten ſmall windows with ſemicircular heads ſurrounding the upper part, but are now bricked up. In that at Bychamwell are four pointed apertures, nearly in the ſame ſituation as the windows in the other tower: the arched parts of theſe and the ſides are formed by plain ſquared ſtones, and the former are diſpoſed in the ſhape of an acute triangle. The tower is of very remote antiquity, and the pointed loops or windows are coeval with the original building. Mr. King, author of Munimenta Antiqua, conſiders theſe ſtructures to be Saxon, and ſays, "another of theſe round Saxon towers is at Wittingham church, near Trowſe in Norfolk, only its top has been raiſed in height and repaired." Other ſpecimens of the ancient circular or Saxon ſtyle of architecture are diſplayed in the following buildings.

The church at South Runcton near Downham, now in ruins, has a ſemicircular eaſt end: and it may be obſerved that a church in this manor was given to the famous abbey at Bury in the time of king Canute.

Thwaite church, near Bungay, has a fine ſemicircular arch of entrance on the ſouth ſide.

In St. Julian's church at Norwich, was formerly an ornamental arched entrance of a ſimilar kind.

The moſt curious and intereſting ſpecimen of the ancient churches is that at Caſtle Riſing.

Of the large and magnificent Norman churches a few fine examples are to be found in this county, the principal of which is the cathedral church of Norwich. This noble edifice diſplays ſeveral intereſting ſpecimens of maſſy columns and ſemicircular arches, with numerous appropriate mouldings, capitals, baſes, &c. In the ruined churches of Wymondham, Attlebury, Binham, Caſtle-Acre, and St. Margaret's at Lynn, are ſeveral examples of nearly the ſame ſtyle and age, and all diſplay conſiderable grandeur of deſign with ſtability of conſtruction. Examples of a later and more elegant ſtyle of architecture are ſeen in St. Nicholas chapel at Lynn, and the Lady Mount chapel at the ſame place; in the fragment of Walſingham priory church; in the churches of St. Peter Mancroft and St. George's, &c. at Norwich; in thoſe of Hingham, Ayleſham, Cromer, Fakenham, Eaſt Deerham, Swaffham, &c. Several of theſe buildings are ornamented with ſcreens, piſcinas, monuments, fonts, &c. Of the latter, particularly fine ſpecimens are to be found in the churches of Binham, Norwich, Walſingham, and Wymondham.

The buildings of a county are uſually conſtructed with the natural materials of the diſtrict, whence the geological character of a province may be generally aſcertained by its public ſtructures; thus, Norfolk producing ſcarcely any ſtone, the builders were obliged to ſubſtitute flints, as being very abundant. Theſe, being uſually found in ſmall irregular pieces, were not eaſily adapted to flat ſurfaces, or to facilitate the making of a wall. In large caſtellated ſtructures, where the walls were required to be very thick, they proved ſuperior to any other ſubſtance; but in thoſe buildings they were commonly encloſed with ſquared ſtones, and ſtrongly cemented with fluid mortar. In this manner they are uſed in the walls of Garianonum and of Venta Icenorum; alſo in Norwich caſtle, Caſtle Riſing, and in ſeveral old churches in this county. In the former Mr. Wilkins, in Archæologia ſtates, that "alternate courſes of ſquared flints were employed." The ſame ſcientific architect further obſerves, that "no material whatever can exceed the durability of flints; for we do not find an inſtance any where of their periſhing by froſty or wet weather; and when ſquared or laid with care they are extremely beautiful. In building, notwithſtanding, they have but little bond, and depend much on the mortar cement they are fixed with; for if wet by any means gets behind them the froſt ſoon levels the work. Many, indeed moſt, of our churches and public buildings in this county are built almoſt wholly of this material; but the moſt remarkable I have obſerved in flints faced and ſquared, and laid in ſmall regular courſes, is the convent gate to Norwich cathedral, which was built in the reign of Edward I., where the walls to the eaſt and the ſouth have a tracery work formed with free-ſtone, and the intervals are filled with ſquare flints; and ſome about Erpingham's-gate, built in penance for Lollardiſm in the reign of Richard II. The chapel of the Virgin Mary on the ſouth ſide of St. Michael's Coſlany church, which is indeed a maſter-piece (where the ſtone tracery is beautifully filled with black flints, as reſemble ſuch old cabinets as we ſometimes ſee inlaid with ivory), was built about the year 1500: and a building in St. Andrew's pariſh, which is recorded as a very rare and beautiful piece of flint work, built in 1403, by William Appleyard, who was the firſt mayor, and ſerved the office in this houſe, which was afterwards ſold to the corporation, and is the preſent Bridewell. Many country churches have been alſo built in this way, as at Cromer, &c. in Norfolk, and many in Suffolk and Eſſex. The art of ſquaring the flints in this curious manner is now almoſt totally neglected, though I am convinced it might very ſoon be brought to perfection again from the facility I obſerved the workman acquire by a little practice in repairing under my ſuperintendance, in biſhop Bagot's time, a tower belonging to the palace." The authorities for the preceding account are, An Eſſay towards a Topographical Hiſtory of the County of Norfolk, by F. Blomefield, 11 vols. 8vo. A general View of the Agriculture of Norfolk, by A. Young, 8vo. 1804. General View of the Agriculture of the County of Norfolk, by N. Kent, 8vo. 1796. Beauties of England, vol. xi., by J. Britton, F.S.A.

Norfolk, a populous maritime county of Maſſachuſetts, in America, lately taken from the ſouthern part of the county of Suffolk, and lying to the ſouthward round the harbour and town of Boſton: it contains 20 townſhips, of which Dedham is the ſeat of juſtice. The number of inhabitants is 27,216.—Alſo, a populous county of Virginia, bounded N. by James' river, which divides it from Warwick. It contains 7758 free inhabitants, and 4735 ſlaves.—Alſo, a port of entry, poſt-town, and ſeat of juſtice in the above county, on the E. ſide of Elizabeth river, immediately below the confluence of the eaſtern branch. It is the moſt conſiderable commercial town in Virginia. The harbour is ſafe and commodious, and large enough to contain 300 ſhips. It contains about 500 dwelling-houſes, a court-houſe, gaol, an Epiſcopal and Methodiſt church, a theatre, and an academy. The number of free inhabitants is 4222, and that of ſlaves is 2724. It is governed by a mayor and ſeveral aldermen. It carries on a briſk trade with the Weſt Indies, Europe, and the different ſtates, and conſtitutes with Portſmouth, which ſtands on the oppoſite ſide of the river, a port of entry. The exports for the year, ending Sept. 30, 1794, amounted in value to 1,660,752 dollars. A canal is formed from the N. branch of Albemarle found in North Carolina to the waters of the S. branch of Elizabeth river, 9 miles from Norfolk; and merchant veſſels of the largeſt ſize may go within a mile from the mouth of the canal; 114 miles E.S.E. of Richmond. N. lat. 36° 55'. W. long. 76 28.—Alſo, a townſhip in Litchfield county, Connecticut; 15 miles N. of Litchfield, on the Maſſachuſetts line, containing 1749 inhabitants.—Alſo, a county in Upper Canada, bounded N. and E. by the county of Lincoln and the river Thames, on the W. by lake Erie, until it meets the Barbue (called the Orwell river) thence by a line running

ning N. 16° W. until it interfects the Thames, and thence up the faid river until it meets the N.W. boundary of the county of York.

Norfolk *Ifle*, an iſland in the South Pacific ocean, of good height, and five leagues in circuit, difcovered by captain Cook in October 1774, and ſo called by him in honour of the noble family of Howard. The captain and his companions found it uninhabited, and were the firſt perſons who ever landed upon it. They met with many trees and plants common at New Zealand, and more eſpecially the flax plant, which is here more luxuriant than in any part of that country; but the chief produce is a ſort of ſpruce-pine, which grows very abundantly, and to a large ſize, and very ſtraight and tall. This tree reſembles the Quebec pine. For about 200 yards from the ſhore, the ground is ſo thickly covered with ſhrubs and plants as hardly to be penetrable further inland. The ſoil ſeemed rich and deep. Here were found the ſame kind of pigeons, parrots, and parroquets, as at New Zealand, rails, and ſome ſmall birds. The ſea-fowl conſiſt of white boobies, gulls, tern, &c. which breed undiſturbed on the ſhores and in the cliffs of the rocks. The iſle affords freſh water; and alſo cabbage-palm, wood-ſorrel, ſow-thiſtle, and ſamphire. The cabbage of the tree ſo called is not only a wholeſome vegetable, but very palatable, and affords an agreeable repaſt. The coaſt does not want fiſh, ſome of which is excellent. It is high-water at the full and change, about one o'clock; and the tide riſes and falls about four or five feet perpendicularly. A ſettlement was made upon this iſland by a detachment from Port Jackſon in 1788, and we learn from lieutenant King, that no veſſel of 30 or 40 tons can remain with ſecurity through the year in any place round the iſland, without removing to the lee-ſide as the wind changes. Anchorage is every where good, as the bottom is a coral ſand. The productions of the iſland are timber for the conſtruction of veſſels, pines for maſts, and when the flax-plant can be wrought, a ſufficiency of cordage for the navy of Great Britain: this plant abounds in the iſland, and needs no cultivation. In the ſummer months the ſea-coaſt furniſhes turtle. Banana-trees have been found here; the ſugar-cane grows well; wines, oranges and lemon-trees are in a thriving ſtate; the potatoe alſo furniſhes two crops annually; melons and pumpkins are very fine, and every kind of garden vegetable proſpers. Rice has been ſown twice, but it is ſubject to be blaſted by the S.E. winds; however, that which eſcaped the blight yielded a great increaſe. Cotton and indigo thrive in ſome parts of the iſland. The quantity of ground cleared and cultivated in March 1790, was 30 acres belonging to the crown, and about 18 acres cleared by free people and convicts for their gardens. S. lat. 29° 2′ 30″. E. long. 168° 16′. Cook's Second Voyage, vol. ii.

Norfolk, *New*, a tract of country on the W. coaſt of North America, extending from Crofs Sound to New Cornwall.

Norfolk *Sound*, a bay on the north-weſt coaſt of America. The women here, as well as at Port Mulgrave, and Hippah, one of Queen Charlotte's iſlands, ornament, or rather diſtort, their lips in the manner deſcribed under the article *Port des* Français; and, as Dixon ſays in his Voyage, it ſhould ſeem, that the female who is ornamented with the largeſt piece of wood, is generally moſt reſpected by her friends, and by the community in general. N. lat. 57° 3′. W. long. from Paris 135° 36′.

NORGHES, a town of Aſia, in the principality of Georgia, which was taken in 1395 by Timur Bec, who put the inhabitants to the ſword and razed the walls.

NORHOLM, a town of Norway, in the dioceſe of Chriſtianfand; 16 miles N.N.E. of Chriſtianfand.

NORI, a town of Sardinia; 18 miles N.E. of Cagliari.

NORIA, a town of South America, in the province of Cordova; 21 miles N.N.W. of Cordova.

NORICUM, in *Ancient Geography*, a province of Europe, extending along the S. bank of the Danube, from the mouth of the Inn, as far as mount Cetius. Noricum became a province under the reign of Auguſtus; and, in proceſs of time we find, under the denomination of diſtricts or provinces, "Noricum Ripenſe," adjacent to the Danube, and "Noricum Mediterraneum." This province was bounded on the N. by the Danube, on the E. by Pannonia, on the S. by a ſmall portion of the Save (Savus), and the Julian Alps, and on the W. by Vindelicia. The population of this province conſiſted, according to Ptolemy, towards the W. and N., of the Sevaces and the Alauni, called alſo Ambiſontii, and towards the E., of the Norici, the Ambidrani, and the Amblici. Noricum was ſubject to the Romans in the time of Auguſtus, and they preſerved it from the Germans, the Quadi, the Maſcomani, &c. Afterwards the Goths took poſſeſſion of it, and it has been ſaid that Alaric made it the ſeat of his empire. At a later period, the Suevi, the Heruli, and the Huns occupied it.

NORIE, in *Geography*, a town of Sweden, in the province of Schonen; 16 miles N.N.W. of Chriſtianſtadt.

NORIN, a river of Dalmatia, which runs into the Narenza; eight miles below Citluc.

NORIS, Henry, in *Biography*, a very learned Italian cardinal, deſcended from a family originally from Ireland, was born at Verona in the year 1631. His father, Alexander, was a literary character, and well known by his writings, particularly by his "Hiſtory of Germany." Perceiving that his ſon gave early indications of an excellent underſtanding, and a love of learning, he determined to do juſtice to his talents by procuring for him the advantages of a good education. When Henry had arrived at the age of fifteen, he was admitted a penſioner at the Jeſuits' college at Rimini, where he went through his courſe of philoſophy. Here he began to ſtudy the writings of the fathers, particularly thoſe of St. Auguſtine; and ſoon after he took the habit in the convent of the hermits of St. Auguſtine at Rimini, and applied with inceſſant aſſiduity to the ſtudy of all the branches of ſacred and profane literature, and antiquities in general. When the term of his noviciate expired, he was ſent for by the general of his order to Rome, in order that he might purſue his ſtudies with ſtill greater advantage. Here he ſpent his days, and often his nights too, in cloſe and unwearied application, uſually ſtudying fourteen hours a-day. At the age of twenty-one he began his "Hiſtory of Pelagianiſm," but his progreſs in it was neceſſarily ſlow, owing to the many employments which were aſſigned to him, ſo that ſeveral years elapſed before he could give it to the public. It was printed at Florence in the year 1673. In the following year he was invited by the grand duke of Tuſcany to become his chaplain, and he alſo appointed him profeſſor of eccleſiaſtical hiſtory in the univerſity of Piſa. This employment coincided with his wiſhes, and he retained it many years, poſſeſſing not only the eſteem and friendſhip of many learned men, who at that time adorned Tuſcany, but alſo the protection and favour of the cardinal prince Leopold, and that of Coſmo III. In the mean time his "Hiſtory of Pelagianiſm" had attracted conſiderable notice in the learned world, and while it was highly applauded by one party, it excited the moſt violent cenſures of others. It was twice ſubmitted to the cognizance of the Inquiſition,

and on both occafions was pronounced free from any paſſages which called for condemnation. From this period (1676) father Noris lived in peace during the ſpace of ſixteen years, and continued all that time to teach eccleſiaſtical hiſtory at Piſa, purſued his various ſtudies with indefatigable ardour, and preſented the public with ſome of the fruits of his labours. Among others, he publiſhed "Diſſertatio Duplex de duobus Nummis Dioclefiani et Licinii, cum Auctuario Chronologico de votis decennalibus Imperatorum et Cæſarum." He alſo publiſhed ſeveral pieces in chronology, of which the moſt conſiderable was entitled "Epochæ Syro-Macedonum paræneſis ad Joannem Harduinum," 1689. This was followed by "A Diſſertation on the Paſchal Cycle of the Latins." While he was ſtudying at Rome, he became known to queen Chriſtina of Sweden, who entertained a great eſteem for him, and profeſſed to read his different publications, as they appeared, with the greateſt ſatisfaction. She made many attempts to engage him to return to Rome, as did likewiſe the popes Clement X. and Innocent XI. At length, in the year 1692, pope Innocent XII. urged him ſo ſtrongly on the ſubject, that he did not deem it prudent any longer to reſiſt, and upon his arrival at Rome, his holineſs immediately appointed him ſub-librarian of the Vatican. This circumſtance excited the jealouſy of his enemies, who endeavoured to undermine his reputation by renewing their attacks upon his writings. A commiſſion was appointed by the pope to re-examine them, and to make a full report. So ſtrongly did they ſpeak in favour of father Noris, that his holineſs immediately appointed him counſellor to the Inquiſition, and in 1695 he raiſed him to the dignity of cardinal. In 1700 he was nominated librarian of the Vatican. Two years after this, he received directions from the pope to apply himſelf to the reformation of the calendar, but he had not made much progreſs in the buſineſs, when he was attacked with an incurable dropſy, which proved fatal in 1704, at the age of ſeventy-three. He was one of the moſt learned men of his time, and was peculiarly well informed in ſacred and profane hiſtory. His genius was lively and penetrating; his powers of memory very conſiderable; as a writer his ſtyle is correct, pure, and frequently elegant. He was author of many other works beſides thoſe already mentioned. The whole of them have been publiſhed collectively at Verona 1729—32, in five volumes folio. Morei.

NORMAL Line, in *Geometry*, is uſed for a perpendicular line. See Perpendicular, and Subnormal.

NORMAN, in *Sea Language*, a name given to a ſhort wooden bar, thruſt into one of the holes of the windlaſs, in a merchant ſhip, whereon to faſten the cable. It is only uſed where there is very little ſtrain on the cable, as in a commodious harbour, when the ſhip is well ſheltered from the wind and tide.

Norman *Architecture*, that ſpecies of building practiſed by the Normans after the conqueſt of England.

This ſtyle of building was merely an adoption of that practiſed by their Saxon predeceſſors; and, therefore, the Normans are not the inventors of this ſtyle of building, as has been generally ſuppoſed.

Before we can have any idea of the ſtyle of building practiſed by the Normans, it will firſt be neceſſary to ſhew the characteriſtic features of the Saxon ſtyle, which were thick walls generally without buttreſſes, which, if introtroduced, was more for the ſake of ornament than ſtrength, as the ſubſtance of the walls rendered them unneceſſary. The arches employed were all ſemicircular, or at leaſt, if the pointed arch is to be found, it is to be attributed rather to an accidental circumſtance than to any prevailing taſte.

The plan of the firſt Saxon churches conſiſted only of a ſimple oblong extending in its longer dimenſion from eaſt to weſt; but in after-times the eaſt end was converted into a ſemicircle: the north and ſouth ſides were each branched out with a wing, ſo as to give the edifice the form of a croſs, and over the interſection of the croſs was erected a tower. The entrance was through the weſt end. The large Saxon churches had three aiſles in a breadth, and the walls of the nave were ſupported by cylindrical or polygonal columns with a regular baſe and capital, which was generally plain; but it was alſo ſometimes enriched with foliage and even animals. The archivolts of the arches, which reſted upon the columns, conſiſted at firſt of faces receding from each other in parallel planes and ſoffits, which were cylindric ſurfaces perpendicular to the naked or general face of the building. The ſhafts of the pillars in the moſt ancient examples were in general plain.

Many diſcordant opinions have been advanced concerning what really conſtitutes Norman architecture.

The only material difference between Saxon and Norman architecture appears in the magnitude of the ſtructures of the latter people, and the more frequent uſe of ſtone.

The Normans were not the inventors of the pointed arch, as ſeveral inſtances of that ſpecies are to be met with prior to the conqueſt; and, indeed, the firſt buildings erected by the Normans had circular arches. The frequent uſe of the pointed arch did not take place till long after the conqueſt, and even then it was often mixed with the circular in the ſame building. The changes of the ſtyle of architecture were not immediate, but effected in ſucceſſion, and though but ſmall at a time, the change was great in the end, ſo that the edifices were much improved in point of grandeur, proportion, and elegance of decoration.

The Norman era may be ſtated to be from A.D. 1066 to 1154, from the conqueſt to the death of Stephen.

The Normans greatly increaſed the dimenſions of the churches. The ornaments formerly uſed in the Saxon arches were retained, and others were added of a much more exuberant kind. The foliage and other carvings were much more elaborate; however, their edifices ſtill wanted the pediments and pinnacles, as in thoſe which afterwards were termed Gothic or pointed.

The prelates in the early Norman reigns were men of conſummate ſkill in architecture; they applied themſelves to the rebuilding of cathedral churches, and alſo the rebuilding of the greater abbeys. No leſs than fifteen of the twenty-two Engliſh cathedrals retain conſiderable portions, which are undoubtedly Norman workmanſhip, and of which the ſeveral dates are aſcertained. The Normans, who either were architects themſelves, or under whoſe auſpices architecture flouriſhed, are Gundulph, biſhop of Rocheſter, who flouriſhed from A.D. 1077 to 1107; Mauritius, biſhop of London, who flouriſhed from 1086 to 1108; Roger, biſhop of Saliſbury, from 1107 to 1140; Ernulf, biſhop of Rocheſter, from 1115 to 1125; Alexander, biſhop of Lincoln, from 1123 to 1147; Henry of Blois, biſhop of Wincheſter, from 1129 to 1169; and Roger, archbiſhop of York.

The works of Gundulph may be ſeen at Rocheſter, Canterbury, and Peterborough. Mauritius of London built old St. Paul's cathedral; Roger of Saliſbury the cathedral of old Sarum; Ernulf completed the work begun by Gundulph at Rocheſter; Alexander of Lincoln rebuilt his own cathedral; and Henry Blois, biſhop of Wincheſter, a moſt eminent

eminent architect, built the conventual churches of St. Croſs and Rumfey, in Hampſhire; but with reſpect to Roger, archbiſhop of York, none of his works remain.

By theſe architects the Norman ſtyle of architecture was progreſſively brought to perfection in England, and it will be eaſily ſuppoſed, that the improvements made by any of them were only adopted in ſucceſſion.

Many of the churches belonging to the greater abbies were conſtructed in this era; but of theſe, few, indeed, have eſcaped the general demolition at the reformation.

From A.D. 1155 henceforth the ſtyle of eccleſiaſtic edifices begun to aſſume other features; and at this period the conquerors became blended with the conquered, and, therefore, the Norman era properly ceaſes. From this period alſo we may date the commencement of the pointed arch ſtyle, or what is vulgarly called Gothic.

With reſpect to the military ſtructures of the Normans, they knew they could not live in ſecurity without building ſtrong places of defence, they therefore erected a caſtle upon every lordſhip, or aſſimilated with their own, what they found already erected to their hands.

The leading diſcrimination in a Norman fortreſs, is a lofty mound of earth thrown up in the centre of the other works, from the excavations neceſſary in forming the ditch, foſſe, or moat. A ſquare or circular tower, conſiſting of ſeveral ſtories, roſe from the upper ballium, or a low circular ſtory of conſiderable diameter, which was uſually approached by very ſteep ſtone ſtairs on the outſide.

The gateway or tower of entrance, and the barbican or watch tower, had both of them a communication with the keep. Remarkable inſtances in the ſquare form are thoſe of the towers of London, Norwich, Rocheſter, Dover caſtle, Hedingham (Eſſex), Bamborough (Northumberland), Porcheſter, Colcheſter, Kenilworth, Knareſborough, Cariſbrooke, and Oxford. Of the circular are Arundel, Pontefract, and Coniſburgh (Yorkſhire), Lincoln and Tunbridge in Kent. Beſides the above ſtated towers, an irregular form, of which the plan conſiſts of ſeveral ſegments of circles, may be ſeen in Clifford tower in York, and Berkeley caſtle, Glouceſterſhire. Theſe keeps or citadels in ſubſequent eras underwent no alteration, whatever additions or improvements took place in architecture.

Biſhop Gundulph ſeems to have conſidered the lofty artificial mound, originally of Daniſh uſage, as unneceſſary. His central towers are ſo lofty as to contain four ſtories, as was alſo the caſe with moſt other keep towers. The baſement was the dungeon without light: the portal or grand entrance was raiſed many feet above the ground; but his great merit conſiſted in various architectural contrivances, by which as much ſecurity during a ſiege was given to his keeps by ſtratagem, as by real ſtrength. The walls were not unfrequently from 12 to 20 feet thick at the baſe. In the ſouterrain of the vaulted ſtone the military engines and ſtores were depoſited. In the thickneſs of the walls were placed winding ſtaircaſes, the well for water, the vaſt oven, encloſed galleries and chimnies, with an aperture open to the ſky, and communicating with the dungeon, in which priſoners were confined, and to whom it gave all the light and air they could receive. There was alſo a kind of flue for conveying ſound to every part, not more than eight inches in diameter. The ſtate apartment occupied the whole third ſtory, and the ſtaircaſes leading to it were much more commodious than the others, and even ſo large as to admit of military engines. Adjoining to the great chamber was the oriel, lighted by a large window embowed within ſide. In Rocheſter caſtle the chief room was thirty-two feet high, including the whole ſpace within the walls. The walls of the ground-floor ſtory had no light, the ſecond had only loop holes; but the third had large arched windows, placed ſo high as not to be looked through, and ſo defended by an internal arcade, that no miſſile weapon could enter or fall with effect. Each floor had its communication with the well. The chimnies were very capacious, projected conſiderably into the rooms, and reſted upon ſmall pillars; and the ſinks were ſo contrived, in an oblique direction, that no weapons could be ſent up them.

Gundulph is ſaid to have introduced the architectural ornaments of the eccleſiaſtic ſtyle into fortreſſes, both within ſide and without. Moſt of the Norman caſtles had a richly carved door-caſe or portal, as the remains of Arundel and Berkeley amply teſtify. The windows were decorated with moulding, frequently ſculptured. Caſtle Riſing, Norfolk, and Norwich abound in admirable ſpecimens of Norman arcades and mouldings.

The great tower of entrance was built at the foot of the artificial mount, from which was a ſally-port, with ſtone ſtairs leading to the keep. It contained the portcullis and draw-bridge affixed to the arch-way, and ſeveral ſpacious chambers. In point both of formation of the mount and keep, and their connection with the entrance-tower, the remains of Tunbridge, and the more perfect ſtate of Arundel caſtle, exhibit a ſingular reſemblance. The walls were protected by ſtrong buttreſſes, and the round towers had a central ſpace left open to admit the light and air. At Arundel, the corble ſtones which ſupported the beams of timber are ſtill to be ſeen.

The well-authenticated buildings of Norman conſtruction, erected from before A.D. 1100 to 1150, are the abbies of Abingdon, Reading, and Cirenceſter, deſtroyed; Malling, Kent; Tewkeſbury, nave, aiſles, tranſept, and weſt front; Malmſbury, nave and weſt front; Buildwas, Salop; St. Botolph, Colcheſter; Bolton, Yorkſhire; Winborn Minſter, Dorſet; Caſtle Acre, Norfolk; Dunſtable, Bedfordſhire; St. Croſs, Hants; Romſey, Hants; Furneſs, Lancaſhire, the moſt ancient parts; Llandisfarne, Northumberland; Byland, Yorkſhire; Sanercoſt, Cumberland; Sherbourn, Dorſet; Southwell, Nottinghamſhire; Kirkſtall, Yorkſhire, nave. Of thoſe now named, Tewkeſbury, Malmſbury, Winborn Minſter, St. Croſs, Romſey, and Sherbourn, are now uſed as parochial churches.

From A.D. 1155, the ſtyle of architecture practiſed by the Normans began to be mixed with new forms and decorations, and at length to be ſuperſeded by that much more elegant and lofty ſtyle of building, improperly denominated Gothic.

The principal works that may be conſulted in Norman architecture, are the Archæologia, Carter's Ancient Architecture of England, Britton's Architectural Antiquities of Great Britain, and Dalaway's Engliſh Architecture.

NORMAN, *Cape*, in *Geography*, a cape on the weſt coaſt of Newfoundland, on the gulf of St. Lawrence, and the weſt entrance of the narrow bay of Mauco; 20 leagues from Cape Ferrol. N. lat. 51° 39′. W. long. 55° 58′. High water at full and change, at 9 o'clock.

NORMAN'S *Iſland*, a ſmall iſland of America, near the ſouth-weſt coaſt of Martha's Vineyard. N. lat. 41° 13′. W. long. 70° 45′.—Alſo, a ſmall iſland in the Weſt Indies; 18 miles E. of St. John, one of the Virgin iſlands.

NORMANDY, a conſiderable province of France before the revolution, bounded N. by the Engliſh Channel, E. by Picardy and the Iſle of France, S. by Beauce, Perche, and Maine, and W. by Bretagne; about 150 miles from E. to W., and 75 from N. to S.; divided into Upper and Lower, and containing many conſiderable cities and towns.

towns. It is now divided into the departments of the Channel, the Calvados, the Lower Seine, the Eure, the Orne, with a ſmall part of the Eure and Loire; which ſee reſpectively.

Under the Roman emperors, this province was the ſecond "Provincia Lugdunenſis;" and under the kings of the Franks, it conſtituted a part of the kingdom of Neuſtria. It was ceded to piratical Normans, who ſettled in Neuſtria, as a fief of France, in 912, by Charles the Simple, who gave his daughter, Giſle, to their duke and leader, Rollo. The ſucceeding dukes roſe to great power, and William, in 1066, became king of England. In 1135 the male line of this king and duke became extinct in the perſon of Henry I., whoſe daughter Matilda married Godfrey, count of Anjou; from which marriage ſprung Henry II., king of England. Henry III. of England ceded to Louis the Pious, and his ſucceſſors, all claim to this province, which, till the end of the 14th century, ſome kings beſtowed on their eldeſt ſons, with the title of duke of Normandy, till that of dauphin was inſtituted. By the animoſities between the houſes of Orleans and Burgundy, the Engliſh had an opportunity of overrunning not only Normandy, but a great part of France. They held the province about thirty years, and were driven out by Charles VII.

NORMANNORUM Terra. See Terra.

NORMOLOCO, in *Geography*, a town of South America, in the province of Tucuman; 70 miles S. of Salta.

NORNDORFF, a town of Germany, belonging to the lordſhip of Fugger, on the Schmuter; 12 miles N. of Augſburg.

NORO, a country of Africa, ſituated ſouth of Caſhna, and north of the Niger.

NOROCHI, a town of Mexico, in New Biſcay; 95 miles W.S.W. of Parral.

NOROY-LE-BOURG, a town of France, in the department of the Upper Saone, and chief place of a canton, in the diſtrict of Veſoul; 6 miles E. of Veſoul. The place contains 1035, and the canton 7813 inhabitants, on a territory of 187½ kiliometres, in 18 communes.

NORPUY, a town of Hindooſtan, in Bahar; 37 miles S.S.W. of Patna.

NORRALA, a town of Sweden, in Helſingland; 5 miles N.N.W. of Soderhamn.

NORRENT, a town of France, in the ſtraits of Calais, and chief place of a canton, in the diſtrict of Bethune. The place contains 1184, and the canton 12,741 inhabitants, on a territory of 142½ kiliometres, in 31 communes.

NORRHO, a town of Sweden, in Helſingland; 16 miles N.W. of Hudwickſwall.

NORRIDGEWOCK, a poſt-town of America, in the ſtate of Maine, ſituated on Kennebeck river, in Kennebeck county, incorporated in 1788, and containing 633 inhabitants; 35 miles N.W. of Auguſta.

NORRIS, John, in *Biography*, an Engliſh divine, was born at Collingbourne, in Wiltſhire, in 1657, and educated at Wincheſter ſchool, from whence he removed to Exeter college, Oxford. In 1680 he was choſen fellow of All-Soul's college, where he took his degree of M.A. In 1689 he was preſented to the rectory of Newton St. Loo in Somerſetſhire, and afterwards to that of Bemerton in Wiltſhire. He died in 1711, leaving behind him the character of a pious, learned, and very ingenious man, but ſtrongly tinctured with the Platonic myſticiſm. He wrote a defence of the Immortality of the Soul, in oppoſition to Mr. Dodwell; but his principal work was publiſhed in 1688, entitled "The Theory and Regulation of Love, a Moral Eſſay," intended to demonſtrate the reduction of all virtue and vice to the various modifications of love. He was author of many other works, of which an account may be ſeen in the Biographia Britannica, and alſo in the General Biographical Dictionary.

NORRISTON, or Nosriton, in *Geography*, the principal town of Montgomery county, Pennſylvania, ſeated on the north bank of the Schuylkill; 20 miles N.W. of Philadelphia; containing about 20 compact houſes, a court-houſe, and gaol, a handſome edifice for the preſervation of records, and an obſervatory near the manſion-ſeat of the late Dr. Rittenhouſe, by whom it was erected, and where he was interred at his particular requeſt, in June 1796. The number of inhabitants is 922. N. lat. 40° 7'. W. long. 75° 24'.

NORRMARK, a town of Sweden, in the government of Abo; 7 miles N.N.E. of Biorneborg.

NORRO, a ſmall iſland between the coaſt of Finland and the iſland of Alan. N. lat. 60° 34'. E. long. 20° 50'.

NORRON, a ſmall iſland on the weſt ſide of the gulf of Bothnia. N. lat. 60° 48'. E. long. 17° 11'.

NORROY, *North-Roy, q. d.* Northern king; the title of one of the two provincial kings at arms, or provincial heralds. See King *at Arms* and Herald.

His juriſdiction lies on the north ſide of the Trent, whence his name; as Clarenceux, on the ſouth.

Norroy is the moſt ancient title of the kings at arms, of whom there have been ſeveral at different times in this realm; and perhaps it is the only one in England, taken from the ſituation of his province, unleſs "Marche" ſhould be conceived to be of that nature: for as to "Clarenceux," he is not from the place, but "Roy des Clarenceux," from the people inhabiting in that place. It is very probable, that the proper title of this northern king is, as he is often anciently written, "Norreys," and "Norreis," king of arms of people reſiding in the north; as "Garter" is ſtyled "Roy des Anglois," of the people, and not "d'Angleterre," of the kingdom; for we learn from ancient hiſtorians, that the inhabitants of the north were called Norreys. It appears by an authentic document, that there was a king of arms for the parts or people on the north of Trent, in the beginning of the reign of king Edward I.; and he is mentioned again, together with the minſtrels, in the 16th year of Edward II.; but in his ſucceſſor's reign, the title "Norroy" was appropriated to a king of heralds, who is afterwards eſpecially called "Rex Norroy, &c." From the 22d year of king Edward III. to the 9th year of Richard II., no mention is made of any ſuch officer. When Edward IV. obtained the throne, this province was placed again under a king of arms, with the old revived title of "Norroy;" and from that time to the preſent, the office of Norroy hath been continued without interruption.

NORRSKAR, in *Geography*, a ſmall iſland on the weſt ſide of the gulf of Bothnia. N. lat. 60° 48'. E. long. 17° 11'.

NORS, a river of Sweden, which runs into the Wenner lake, 4 miles N.E. of Galſta.

NORT, a town of France, in the department of the Lower Loire, and chief place of a canton, in the diſtrict of Chateaubriant; 18 miles S. of it. The place contains 3180, and the canton 10,265 inhabitants, on a territory of 267½ kiliometres, in 6 communes.—Alſo, an iſland of Ruſſia, in the gulf of Finland; 44 miles W. of Revel. N. lat. 59° 15'. E. long. 26° 14'.

NORTELGA, or Nor Telge, a ſea-port town of Sweden, in the province of Upland, built by Guſtavus Adolphus, and in 1622 endowed with the ſtaple and other privileges, but diſcontinued in 1637. The inhabitants now

ſubſiſt

ſubſiſt by navigation and fiſhing; and near it is a forge for making fire-arms; 30 miles N.E. of Stockholm. N. lat. 59° 46′. E. long. 18° 32′.

NORTGAU, a country of Germany, called alſo the "Upper Palatinate," of which Amberg is the capital. See PALATINATE.

NORTH, FRANCIS, *Lord* GUILFORD, in *Biography*, lord keeper of the great ſeal in the reign of Charles II. and James II., was the third ſon of the ſecond Dudley lord North, baron of Kertling, vulgò Catlage, &c. From Bury ſchool, where he made great proficiency in grammar learning, he was removed to St. John's college in Cambridge, and admitted a fellow-commoner in 1653. Here he acquired great reputation by his aſſiduity and attainments, and recommended himſelf to the eſteem of his aſſociates by the ſprightlineſs of his converſation. From the univerſity he removed to the Middle Temple, and proſecuted various ſtudies with ſingular diligence; ſo that he not only gained the knowledge of the French, Italian, Spaniſh, and Dutch languages, but became a good lawyer, and a proficient in hiſtory, mathematics, philoſophy, and muſic. By the variety of his ſtudies, and particularly by the practice of muſic, he was relieved in his other purſuits. Availing himſelf of the friendſhip and inſtructions of ſir Jeffery Palmer, attorney-general, and the Hydes, he became eminent in his profeſſion; and in the Norfolk circuit, which he uſually attended, he was employed as counſel in every important cauſe. Tired of the routine of his profeſſion, after having been both ſolicitor and attorney-general, he aſpired to the poſt of lord chief juſtice of the common pleas, and at length ſucceeded to his wiſhes in obtaining it. Upon the death of the chancellor Nottingham, the great ſeal was committed to his cuſtody, and he was advanced to the peerage with the title of lord Guilford, by letters patent bearing date September 27th, 1683. The number of his avocations, and the unpleaſantneſs of ſome of his connections after the death of king Charles, induced him to requeſt the king's leave to quit the ſeal. Not ſucceeding in his application, he ſought temporary relief by retirement into the country; but he died at his houſe in Wroxton, in 1685. Although his private character was ſtrictly virtuous and unexceptionable, he is charged with having been too much influenced by the court, ſo as even to endanger the Proteſtant religion in this kingdom. His relation and advocate, Roger North, has endeavoured to vindicate him from all reproaches of his public character, in his "Examen," and in his "Life of the Lord Keeper Guilford."

Philoſophy and ſcience, during the 17th century, ſeem to have intereſted themſelves, and lent their aid in the refinement and melioration of muſical ſound, more than at any other period. Sir Francis Bacon, Kepler, Galileo, Merſennus, Des Cartes, Kircher, and, after the eſtabliſhment of the Royal Society in London, lord keeper North, lord Brouncker, Narciſſus, biſhop of Ferns, Dr. Wallis, Dr. Holder, and ſir Iſaac Newton, have all thought harmony, and the philoſophy of ſound, objects worthy of their moſt profound meditations and reſearches. The lord keeper uſed to ſay, that if he had not diverted his attention by the ſtudy of modern languages and the fine arts, and by the practice of muſic particularly, he ſhould never have been a lawyer.

He publiſhed, in 1677, "A philoſophical Eſſay of Muſic, directed to a Friend." Though ſome of the philoſophy of this eſſay has been ſince found to be falſe, and the reſt has been more clearly illuſtrated and explained, yet, conſidering the ſmall progreſs which had been made in ſo obſcure and ſubtil a ſubject as the propagation of ſound, when this book was written, the experiments and conjectures muſt be allowed to have conſiderable merit. The *ſcheme*, or table of pulſes, at the beginning, ſhewing the coincidence of vibrations in muſical concords, is new, and conveys a clear idea to the eye, of what the ratio of ſounds, in numbers, only communicates to the intellect. Theſe coincidences, upon which the degrees of perfection in concords depend, being too rapid for the ſenſe of hearing to enable us to count, are here delineated in ſuch a manner, as explains the doctrine of vibrations even to a perſon that is deaf. This pamphlet, containing only 35 pages, was publiſhed without the name of the author; but afterwards acknowledged to have been the work of lord keeper North, in the life of that nobleman, written by his brother, the honourable Roger North. His delineation of the harmonical vibration of ſtrings ſeems to have been adopted by Euler, in his "Tentamen novæ Theoriæ muſicæ." The keeper is ſaid, in the Biographical Dictionary, to have compoſed ſeveral concertos in two and three parts. Now no compoſition, in fewer than four or five parts, is ever honoured with the title of concerto; nor was this title given to inſtrumental muſic during the life of lord keeper North, who died in 1685. The concertos of Corelli, Torelli, and Aleſſandro Scarlatti, in ſeven and eight parts, the firſt of the kind, were not publiſhed till the beginning of the laſt century. Fancies in two and three parts, indeed, were, we believe, ſometimes called *conſorts*. And when it is aſſerted, in the ſame dictionary, that lord keeper North may be eſteemed the father of muſical philoſophy, it ſhould have been added, in this country; for Galileo in Italy, and Merſennus in France, had deeply inveſtigated the ſubject of harmonics many years before the publication of the lord keeper North's ingenious eſſay.

NORTH, *The Hon.* ROGER, brother of the preceding, was likewiſe brought up to the law, and was attorney-general to James II. He publiſhed an "Examen into the Credit and Veracity of a pretended complete Hiſtory," *viz.* Dr. White Kennet's Hiſtory of England, and alſo the lives of his three brothers, the lord keeper Guildford, ſir Dudley North, and the Rev. Dr. John North. In theſe pieces there is much curious and truly valuable information, but not without conſiderable partiality.

The Hon. Roger North was adilettante muſician of conſiderable taſte and knowledge in the art, and who watched and recorded its progreſs during the latter end of the 17th, and beginning of the 18th century, with judgment and diſcrimination; leaving behind him, at his deceaſe in 1733, a manuſcript, entitled "Memoirs of Muſic," to which being favoured with acceſs, we found it of great uſe in the hiſtory of Engliſh ſecular muſic, during the period to which his memoirs are confined. See JENKINS, and NICOLA MATTEIS.

This honourable cultivator and patron of muſic lived chiefly at Rougham, in Norfolk, where his life was extended to the age of 83. He had an organ, built by father Smith, for a gallery of 60 feet long, which he erected on purpoſe for its reception. There was not a metal pipe in this inſtrument, which we ſaw and heard in the year 1752, yet its tone was as brilliant, and infinitely more ſweet, than if the pipes had been all of metal.

NORTH, DUDLEY, *Lord*, the third baron of that family, was reckoned one of the fineſt gentlemen in the court of king James, but in ſupporting that character he diſſipated away the greater part of his fortune. In 1645 he appears to have acted with the parliament, and was nominated by them to be adminiſtrator of the admiralty, in conjunction with the great earls of Northumberland, Eſſex, and Warwick. He died at the age of 85. The latter part of his life he paſſed in retirement, and wrote a ſmall folio of miſcellanies, in proſe and verſe, under the title of "A Foreſt

promiſcuous of ſeveral Seaſons' Productions," in four parts, 1659.

North, Dudley, *Lord*, ſon of the former, was made knight of the Bath in 1616, at the creation of Charles prince of Wales. He ſat in many parliaments, till excluded by the prevailing party in that which condemned the king. From this period lord North lived privately in the country, and towards the end of his life entertained himſelf with books. He was author of a ſmall tract, entitled "Obſervations and Advices Economical," 12mo. He wrote likewiſe "Paſſages relating to the Long Parliament:" "The Hiſtory of the Life of Lord Edward North," the firſt baron of the family, addreſſed to his eldeſt ſon; and a "Volume of Eſſays."

North, *The Hon.* John, the fourth brother of the family, was born in 1645. He ſtudied at Jeſus college, Cambridge, and entered into holy orders. He was a man of very extenſive learning, and was appointed Greek profeſſor in the univerſity of Cambridge. While in that ſituation, he publiſhed ſome ſelect dialogues of Plato in 1673. He was clerk of the cloſet to the king, a prebendary of Weſtminſter, and in 1677 ſucceeded Dr. Barrow in the maſterſhip of Trinity college, Cambridge. He died in 1683.

North, Frederick, earl of Guilford, chiefly known as lord North, under which title he was for many years the premier of England. His lordſhip was born April 13th, 1732, but did not ſucceed to the earldom and eſtates till the year 1790. As a miniſter, he ſucceeded the celebrated Mr. Charles Townſend as manager of the houſe of commons (we could, we think, give the office a more appropriate title than is conveyed by the term *manager*) and chancellor of the exchequer; and in 1770, on the reſignation of the duke of Graſton, he was made firſt lord of the treaſury; in which office he continued till the cloſe of the American war, or rather till the formation of the Rockingham miniſtry, by which he and his party, who had deſolated the empire by a long and bloody war, and by the loſs of the American colonies, were removed. After this he formed a coalition with Mr. Fox, which was eſteemed, by the public, as one of the moſt unnatural junctions ever entered into by political characters. It excited an almoſt univerſal abhorrence, and of courſe did not laſt long. Lord North, in 1790, ſucceeded his father as earl of Guilford, and died Auguſt the 5th, 1792. He was a man of ſtrong mental abilities; and either by his eloquence, or by ſtill more attractive means, he commanded attention and enforced conviction. His lordſhip was one of the loudeſt advocates of what during the preſent reign has been denominated the Conſtitution in church and ſtate. No man was ever more beloved in private life, but as a public character his memory cannot be reſpected by thoſe who are friends to the peace, the liberties, and the happineſs of their country and of the human race.

North, in *Coſmography*, one of the four cardinal points of the horizon being that interſection of the horizon and meridian which is neareſt our pole.

North *Bay*, in *Geography*, a bay of the Eaſt India ſea, on the S. coaſt of Chiampa. N. lat. 10° 36′. E. long. 106° 35′.

North *Cape*, a cape on the N. coaſt of Ireland. N. lat. 55° 15′. W. long. 8° 55′.—Alſo, the moſt northerly point of Europe, on the coaſt of Norway. N. lat. 71° 10′. E. long. 26°.—Alſo, a cape on the coaſt of Aſia, in the Frozen ocean. N. lat. 68° 56′. W. long. 179° 9′.—Alſo, a cape on the E. coaſt of South America, forming the N. boundary of Brazil. N. lat. 1° 48′. W. long. 56° 6′.—Alſo, the N. part of the iſland of St. John, in the gulf of St. Lawrence. N. lat. 47°. W. long. 63° 55′.—Alſo, the N.E. point of the iſland of Cape Breton. N. lat. 47° 2′. W. long. 60° 12′.—Alſo, a cape of Africa, on the W. coaſt of Morocco. N. lat. 32° 45′.—Alſo, the northern extremity of New Zealand, which forms the N. point of Sandy bay, and is a peninſula jutting out N.E. about two miles, and terminating in a bluff head that is flat at the top. The land of this cape has the appearance of an iſland; upon it Cook ſaw in 1769 a hippah or village, and a few inhabitants; and on the S.E. ſide of it there appeared to be anchorage and a good ſhelter from the S.W. and N.W. winds.—Alſo, the N.E. point of the iſland of Fernando Po. N. lat. 3° 50′. E. long. 7° 55′.

North, *Department of the*, one of the twelve departments of the ſecond or northern region of France, compoſed of French Flanders, &c., bounded on the N. by the ſea, on the N.E. by Flanders and Auſtrian Hainaut, on the S. by the department of the Aiſne, and on the W. by that of the ſtraits of Calais, in 50° 20′ N. lat. 44 Fr. leagues in length and 10 in breadth, and containing 6030 kiliometres or 278 ſquare leagues, and 774,450 inhabitants. It is divided into 6 circles or diſtricts, 60 cantons, and 671 communes. The circles are Bergues, including 80,242 inhabitants, Hazebrouch, 106,241, Lille, 221,228, Cambray, 108,551, Aveſnes, 91,746, and Douay, 166,442. According to Haſſenfratz, the number of circles is 8, of cantons 59, and of inhabitants 447,910. The capital of this department is Douay. Its annual contributions in the eleventh year of the French era amounted to 6,736,621 fr. and its expences to 514,603 fr. 87 cents. The ſoil of Hazebrouch is marſhy; but the other diſtricts are fertile, yielding abundance of grain, fruits, and paſtures. Hazebrouch contains the foreſt of Nieppe, and in Douay are the mineral ſprings of St. Amand.

North *Coaſts*, *Department of*, one of the nine departments of the N.W. region of France, formerly Upper Bretagne, a maritime territory between Finiſterre and Ille, in 48° 30′ N. lat., bounded on the N. by the Engliſh channel, on the E. by the department of Ille and Vilaine, on the S. by the department of the Morbihan, and on the W. by that of Finiſterre, 30 Fr. leagues in length, 15 in breadth, containing 567½ kiliometres or 353 ſquare leagues, and 499,927 inhabitants. It is divided into 5 circles, 47 cantons, and 376 communes. The circles are Lannion, including 83,633 inhabitants, St. Brieuc, 145,176, Dinan, 96,327, Loudeac, 85,271, and Guingamp, 89,520. The capital is St. Brieuc. According to Haſſenfratz, the number of circles is 9, of cantons 81, and of inhabitants 523,860. The contributions in the year 11 amounted to 2,549,791 fr. and the expences to 306,687 fr. 19 cents. The cultivated tracts in this department yield abundance of grain, wine, flax, fruits, and paſtures. It has iron and lead mines.

North *Company*. See Company.

North *Dial*. See Dial.

North-*Eaſt*, a rhumb, or point, in the middle between the eaſt and north.

North-*Eaſt Land*, in *Geography*, an iſland in the North ſea, of a triangular form, about 200 miles in circuit, ſeparated from Spitzbergen by a channel, called Hinlopen ſtraits. N. lat. 79° 15′ to 80° 18′. E. long. 18° to 23° 30′.

North-*Eaſt Paſſage*. The advocates for the north-eaſt paſſage, ſays a late writer, have divided that navigation into three parts; and by endeavouring to ſhew that theſe three parts have been paſſed at different times, they conclude from thence, that the whole taken collectively is practicable. Theſe three parts are, 1. From Archangel to the river Lena.

2. From

2. From the Lena round Tſchukotſkoi Noſs, (or the north-eaſtern promontory of Aſia) to Kamtſchatka: and 3. From Kamtſchatka to Japan. With reſpect to the firſt part, no one ever aſſerted that it has been performed in one voyage; from an account of the ſeveral voyages that have been made in theſe ſeas it appears, that there is a cape between the rivers Chatanja and Piaſida, that has never yet been doubled. As to the ſecond diviſion of the north-eaſt paſſage, it has been affirmed, that a paſſage has been effected by ſeveral veſſels, which have, at different times, ſailed round the northern extremity of Aſia. But from the Ruſſian accounts it is inferred, that it has been performed but once, *viz.* by one Deſhneff, who, in 1648, is ſaid to have doubled this formidable cape. Of the third, or remaining part of this paſſage, no doubt can be entertained. The connection between the ſeas of Kamtſchatka and Japan has been eſtabliſhed by many voyages. Coxe's Account of the Ruſſian Diſcoveries, &c. 4to. 1780. See NORTH-*Weſt Paſſage*.

NORTH-*Eaſt Point*, in *Geography*, a cape on the iſland of Jamaica. N. lat. 18° 11′. W. long. 76° 2′.

NORTH *Foreland*. See FORELAND.

NORTH *Haven Point*, a cape on the S. coaſt of England, at the entrance of Pool bay; eight miles E. of Pool.

NORTH *Head*, a cape on the N.E. coaſt of New Holland, and N.W. point of Buſtard bay. S. lat. 24°.—Alſo, one of the ſmaller Orkney iſlands. N. lat. 58° 38′. W. long. 2° 55′.

NORTH *Iſland*, a ſmall iſland in the Eaſt Indian ſea, near the W. coaſt of Borneo. S. lat. 1° 22′. E. long 109° 5′.—Alſo, a ſmall iſland near the S. coaſt of Celebes. S. lat. 5° 38′. E. long. 120° 48′.—Alſo, a ſmall iſland near the S.W. coaſt of the iſland of Boutan. S. lat. 5° 33′. E. long. 122° 50′.—Alſo, a ſmall iſland in the North Pacific ocean, in Dixon's entrance. N. lat. 54° 20′. W. long. 133° 10′.—Alſo, an iſland in the Atlantic, near the coaſt of America, at the mouth of the Great Pedee river, near the coaſt of South Carolina. N. lat. 33° 20′. W. long. 79° 3′.—Alſo, a ſmall iſland in the Pacific ocean, diſcovered by captain King in 1779. N. lat. 25° 14′. E. long 141° 10′.—Alſo, a ſmall iſland in the Eaſt Indian ſea. S. lat. 5° 38′. E. long. 105° 43′.

NORTH *Key*, a ſmall iſland in the bay of Honduras. N. lat. 17° 24′. W. long. 87° 57′.

NORTH *Mountains*, a ridge which branches off from the Alleghany mountains, S. of James' river, extending into Maryland, as far as the river Potowmack.

NORTH-*North-eaſt*, *North-eaſt-and-by-eaſt*, are ſubdiviſions of the compaſs between the north and eaſt. See WIND.

NORTH *Point*, in *Geography*, a cape of England, on the coaſt of Durham. N. lat. 55° 4′. W. long. 1° 2′.—Alſo, a cape on the N. coaſt of the iſland of Morty. N. lat. 2° 45′. E. long. 128° 20′.

NORTH *Pole*. See POLE.

NORTH *Reef*, a reef of the iſland of Hiſpaniola. N. lat. 33°. W. long. 69° 12.

NORTH *River*, a river of the iſland of St. Vincent, which runs into the ſea, one mile N. of Young Point.—Alſo, a river of Canada, which runs into the Utwas; 129 miles W. of Montreal.—Alſo, a river of North Carolina, which runs into Albemarle ſound. N. lat. 36° 6′. W. long. 76° 10′.—Alſo, a river of Maſſachuſetts, which runs into the ſea between Scituate and Marble head.—Alſo, a branch of Hudſon's river.—Alſo, a branch of Fluviana river, in Virginia.

NORTH *Sea*. See SEA.

NORTH *Sound Point*, a cape of the iſland of Antigua, at the E. ſide of the entrance into Parham harbour. N. lat. 17° 16′. W. long. 61° 27′.

NORTH *Star*, the laſt in the tail of the Little Bear; called alſo the *pole-ſtar*; which ſee.

NORTH *Wales*, in *Geography*. See WALES.

NORTH *Wales*, a town of Caroline county, Virginia; 10 miles N.W of Hanover.

NORTH *Wall*. See WALL.

NORTH-*Weſt*, is a point or rhumb, in the middle between the north and weſt. See WEST, &c.

NORTH-*Weſt Bay*, in *Geography*, a bay on the N. coaſt of the iſland of Fernando Po. N. lat. 5° 35′. E. long. 7° 35′.

NORTH-*Weſt Company*. See COMPANY and FUR *Trade*.

NORTH-*Weſt Paſſage*. Much difference of opinion has ſubſiſted as to the navigable extremities of our own hemiſphere; particularly as to the exiſtence, or at leaſt, as to the practicability of a northern paſſage between the Atlantic and Pacific oceans, either by ſailing *eaſtward*, round Aſia, or *weſtward*, round North America. If ſuch a paſſage could be effected, it is obvious that voyages to Japan and China, and indeed to the Eaſt Indies in general, would be much ſhortened, and conſequently become more profitable, than by making the tedious circuit of the Cape of Good Hope. To this object the Engliſh, in common with other nations, have directed their attention for more than two centuries. We ſhall now ſay nothing of Cabot's original attempt in 1497, which terminated in the diſcovery of Newfoundland and the Labrador coaſt; but obſerve, that from Frobiſher's firſt voyage to find a weſtern paſſage, in 1576, to thoſe of James and Fox, in 1630, repeated trials have been made by enterpriſing adventurers. In the courſe of theſe voyages, our knowledge of the northern extent of America was enlarged by the diſcovery of Hudſon's and Baffin's bays; and yet the wiſhed-for paſſage on that ſide, into the Pacific ocean, was ſtill unattained. Both our countrymen and the Dutch were equally unſucceſsful, in various attempts to find this paſſage in an eaſtern direction. Wood's failure, in 1676, ſeems to have cloſed the long liſt of unfortunate northern expeditions in that century; and the diſcovery, if not abſolutely deſpaired of, by having ſo often failed, ceaſed for many years to be an object of inveſtigation. Mr. Dobbs, a warm advocate for the probability of a north-weſt paſſage through Hudſon's Bay, in our own times, once more recalled the attention of this country to that undertaking; and by his active zeal, and perſevering ſolicitude, renewed the ſpirit of diſcovery; but it was renewed in vain. For Capt. Middleton, ſent out by government in 1741, and captains Smith and Moore, by a private ſociety in 1746, though encouraged by an act of parliament paſſed in the preceding year, that annexed a reward of 20,000*l.* to the diſcovery of a paſſage, returned from Hudſon's Bay with reports of their proceedings, that left the accompliſhment of this favourite object at as great a diſtance as ever. The object, however, was not abandoned, and captain Cook was ſelected for undertaking a voyage in the proſecution of it. In the project with which he was intruſted, the uſual plan of diſcovery was reverſed; and inſtead of a paſſage from the Atlantic to the Pacific ocean, one from the latter into the former was to be attempted. Accordingly, Capt. Cook was ordered to proceed into the Pacific ocean, and to make his progreſs northward to the principal ſcene of his operations. The commiſſioners of the admiralty drew up inſtructions for his conduct of the voyage, which were ſigned by them on the 6th of July, 1776, and ſubſequently delivered to captain Cook. In order to encourage adventurers in the purſuit of this object, an alteration had been made in the act of parliament, paſſed in 1745, (18 Geo. II. c. 17), which held out a reward of 20,000*l.* merely to ſhips belonging to any of his majeſty's ſubjects, excluſive of his majeſty's

own ſhips, and which held out this reward only to ſuch ſhips as ſhould diſcover a paſſage through Hudſon's Bay. In this new ſtatute, (16 Geo. III. c. 6.) it was enacted, that if any ſhip belonging to any of his majeſty's ſubjects, or to his majeſty, ſhould find out, and ſail through, any paſſage by ſea, between the Atlantic and Pacific oceans, in any direction or parallel of the northern hemiſphere, to the northward of the 52° of northern latitude, the owners of ſuch ſhips, if belonging to any of his majeſty's ſubjects, or the commander, officers, and ſeamen, of ſuch ſhip belonging to his majeſty, ſhall receive, as a reward for ſuch diſcovery, the ſum of 20,000*l.* It was alſo enacted, with a view to the diſcovery of a communication between the Atlantic and Pacific oceans, that if any ſhip ſhall approach to within one degree of the north pole, the owner, &c. or commander, &c. ſo approaching, ſhall receive, as a reward for ſuch firſt approach, the ſum of 5000*l.* In order to facilitate the ſucceſs of Capt. Cook's expedition, lieutenant Pickerſgill in 1776, and lieutenant Young in 1777, were ordered to proceed to Baffin's bay, to explore its weſtern parts, &c. The execution of theſe preconcerted voyages did not anſwer the expectations that were formed of them, for reaſons which it is here needleſs to detail. The inſtructions committed to Capt. Cook were founded on an accurate knowledge of what had been already done, and of what ſtill remained to be performed; and this knowledge pointed out the inutility of beginning his ſearch for a paſſage till his arrival in the latitude of 65°, whither he was directed to repair. The Hudſon's Bay company, though for ſome time tardy in the contrivance and execution of plans and voyages towards the diſcovery of a N.W. paſſage, at length exerted themſelves by land-journies as well as by ſea-voyages for the accompliſhment of this great object; but altogether without ſucceſs. Capt. Cook and Capt. Clerke have made ſuch diſcoveries on the weſt ſide of America, and have given ſuch a report of Beering's ſtrait, as will ſerve, in addition to thoſe of Mr. Hearne by land, and of other navigators, to diſcourage future attempts to penetrate into the Pacific ocean, in any northern direction. Phil. Tranſ. N° 482, ſect. 14. Introduction to Cook's Third Voyage, vol. i.

NORTH-*Weſt Point*, in *Gography*, a cape on the weſt coaſt of Africa. S. lat. 16° 36′.

NORTH-*Weſt River*, a branch of Cape Fear river, in North Carolina.

NORTH-*Weſt Territory*, a part of the United States of America, divided into the ſtates of Ohio, Indiana, and the county of Wayne.

NORTH *Wind*. See WIND.

NORTHADSTEDE, in *Geography*, a town of the duchy of Holſtein; eight miles N.E. of Meldorp.

NORTHALBEN, or NORDHEIM. See NORDHALBEN.

NORTHALLERTON, a borough and market-town in the wapentake of Allertonſhire, North Riding of the county of York, England, is ſituated on the ſide of a riſing ground, gently ſloping towards the eaſt, 31 miles diſtant from the city of York, and 225 miles from London. Near this place, in the year 1138, the memorable battle of the Standard was fought between the Engliſh and Scots. David, king of Scotland, taking advantage of the civil war between king Stephen and the empreſs Matilda, ravaged the northern parts of England, and advanced as far as this town, where he was oppoſed by an army under the command of the earls of Albemarle and Ferrers. To animate the Engliſh forces, the biſhop of the Orkneys, acting as deputy to Thurſtan, archbiſhop of York, who was confined by ſickneſs, brought from the convent of Beverley a conſecrated ſtandard, which was a tall maſt, fixed in a four-wheel carriage, and having at the top a pix with the hoſt, and a croſs with the banners of St. Peter and St. John of Beverley: from this circumſtance the battle acquired its name. The Scots, relying on their ſuperior force, ruſhed to the attack, but were totally routed, with the loſs of 10,000 men, and were glad to return to their own country, with the ſhattered remains of their army. The ſpot on which the conflict took place, is ſtill called Standard-hill.

The town conſiſts principally of one ſtreet, the houſes of which are built with brick: the market-place is ſpacious, and ſurrounded with very good houſes. The church is an ancient ſtructure, built in the form of a croſs, and contains ſeveral monuments. The civil government of the town is veſted in a bailiff, who holds his office for life, by the appointment of the biſhop of Durham for the time being. To this ſee the whole of the manor has been ſubject ever ſince the time of William Rufus. Two members are returned to the imperial parliament from this borough: the right of election is in the whole body of houſholders paying ſcot and lot. A market is held on Wedneſdays, and here are five annual fairs, in which horſes and horned cattle conſtitute the chief articles of traffic. In the parliamentary ſurvey of the year 1811, Northallerton was ſtated to contain 2234 inhabitants, occupying 510 houſes. Near this town an hoſpital, dedicated to St. James, was founded by Hugh Puſar, biſhop of Durham, about the cloſe of the twelfth century: it was granted at the diſſolution to ſir Richard Moryſine, and afterwards became part of the endowment of Chriſtchurch college, Oxford. A ſimilar eſtabliſhment, founded by Richard de Moore in the year 1476, is yet in being; but part of its poſſeſſions having been alienated, only four perſons are maintained in it, who are nominated by the earl of Carliſle, the patron. Beauties of England and Wales; Yorkſhire, vol. xvi. by J. Bigland.

NORTH AMERICA comprehends all that part of the continent of America which lies N. of the iſthmus of Darien, extending N. and S. from about the 10th deg. of N. lat. to the north pole; and E. and W. from the Atlantic to the Pacific ocean, between the 57th and 168th deg. of W. long. from Greenwich. Beyond the 70th degree N. lat. few diſcoveries have been made. North America was diſcovered in 1497, in the reign of Henry VII. by John Cabot, a Venetian; and was then thickly inhabited by Indians. It is now ſuppoſed that there are not more than two millions and a half of the aborigines in N. and S. America. Of North America an account has been already given under AMERICA; but we ſhall here ſubjoin ſome further particulars, correcting the details that occur more largely under that article, and adding others that have not been already introduced. The provinces and ſtates comprehended under North America, are here exhibited under the following more enlarged and correct TABLE.

| Belong to | Countries, Provinces, and States. | | Number of Inhabitants. |
|---|---|---|---|
| Denmark. | Weſt Greenland, | about | 10,000 |
| Britiſh Provinces. | New Britain | | unknown |
| | Upper Canada | about | 80,000 |
| | Lower Canada | — | 150,000 |
| | Newfoundland | — | 7,000 |
| | Cape Breton Iſland | — | 1,000 |
| | New Brunſwick, Nova Scotia, St. John's Iſland | — in 1783, | 35,000 5,000 |

Vermont

| Belong to | Countries, Provinces, and States. | | Number of Inhabitants. |
|---|---|---|---|
| United States of America. | Vermont | in 1800 | 154,465 |
| | New Hampſhire | — | 183,858 |
| | Maſſachuſetts | — | 422,845 |
| | Diſtrict of Maine | — | 151,719 |
| | Rhode Iſland | — | 69,122 |
| | Connecticut | — | 257,002 |
| | New York | — | 586,050 |
| | New Jerſey | — | 211,149 |
| | Pennſylvania | — | 602,545 |
| | Delaware | — | 64,273 |
| | Maryland | — | 349,692 |
| | Virginia | — | 886,149 |
| | Kentucky | — | 220,929 |
| | North Carolina | — | 478,103 |
| | South Carolina | — | 345,959 |
| | Georgia | — | 162,686 |
| | Tenneſſee | — | 105,602 |
| | Ohio | — | 42,159 |
| | Wayne county, a diſtinct government | — | 3,206 |
| | Indiana territory, N.W. of Ohio river | — | 6,407 |
| | Miſſiſippi territory | — | 8,840 |
| | Louiſiana, lately purchaſed by the United States. | See LOUISIANA. | |
| Span. Prov. | Eaſt Florida | | unknown |
| | Weſt Florida | | — |
| | New Mexico | | — |
| | California | | — |
| | Mexico, or New Spain | | — |

See an account of each of the above-mentioned provinces and ſtates under their appropriate titles.

In July 1779, Capt. Cook, and ſince his voyage Capt. Vancouver and many others, have explored and deſcribed the weſtern coaſt of North America. The former proceeded as far as N. lat. 71°, when he came to a ſolid body of ice from continent to continent. Of the diſcoveries of both theſe navigators, and alſo of Perouſe, &c. ſee an account under CALIFORNIA, NEW ALBION, FRANÇOIS, NOOTKA, and NORTH-*Weſt Paſſage*. The interior country has been explored by Meſſrs. Hearne and Mackenzie. The former went northward to the Frozen ocean, at the mouth of Coppermine river. The latter embarked at fort Chepewyan on the S. of the Lake of the Hills, in N. lat. 58° 40′. W. long. 110° 30′, in June 1789, in a canoe of birch bark, with ten aſſociates, three of whom were in another canoe. His courſe was north-weſterly to ſeek the Frozen ocean. Mountains and vallies, dreary waſtes and wide ſpreading foreſts, lakes and rivers, ſucceed each other in his deſcriptions. Very ſmall bands of wandering ſavages were the only people he diſcovered. After leaving the Lake of the Hills, he entered the Slave river, from which he paſſed to the Slave lake, a large body of freſh water, in about N. lat. 61° and 62°, and W. long. 110° to 120°. The country round wears a barren aſpect, but produces a great variety of berries, and is covered with large trees of ſpruce-pine and white birch. Where theſe are deſtroyed, poplars ſucceed, though none were ſeen before. From this lake he entered Mackenzie's river, a deep and ſpacious ſtream. On its banks he found encampments of Kniſteneaux Indians. This wandering tribe ſpreads over a vaſt extent of country. Their language is the ſame as that of the natives on the waters of the St. Lawrence and the coaſt of Labrador. They are of a moderate ſtature, well proportioned and active. Their dreſs is ſimple, countenance open, and eyes black. Their women are the moſt comely of ſavages, and not inattentive to their own perſons, but ſtill pay more attention to the decoration of the men. Theſe people are affable, indulgent to their children, and hoſpitable to ſtrangers. Chaſtity they conſider not as a virtue; they make temporary exchanges of wives, and a proffer of them to ſtrangers is a part of their hoſpitality; inceſt and beſtiality are not uncommon. At their funerals the mourners cut off their hair, lacerate their fleſh, blacken their faces; and widows, as in the eaſt, ſometimes ſacrifice themſelves. Smoking precedes all matters of importance. This ſacred rite ſettles all differences between contending perſons; it is never violated. No perſon may join in this ſolemn act, who has cohabited with a woman within 24 hours—he "is unclean."

After proceeding down this river to N. lat. 69° 1′, and about W. long. 134°, he reached the tide waters of the Frozen ocean; but in the middle of July was forbidden to proceed any further by extenſive fields of ice, and returned to Chepewyan fort, having been abſent 102 days. In October 1792, he proceeded on a voyage to the N. Pacific ocean. From the Lake of the Hills he aſcended the Peace river, which in the drieſt ſeaſon is a quarter of a mile in breadth; the ſoil on each ſide is low and rich. Like other unchriſtianized people, the Indians on this river practiſe polygamy. The women are in the loweſt ſtate of debaſement; more indecent and filthy than the men. The females perform all the drudgery allotted to brutes in civilized ſociety, excepting what aid they receive from a few ſmall dogs. While the men carry nothing but a gun, their wives and daughters follow with ſuch oppreſſive burdens, that if they lay them down they are unable to raiſe them again. This help the men will not deign to lend them; they often, therefore, lean againſt a tree for a partial, temporary relief. Theſe people are total ſtrangers to the moſt ſimple remedies in time of ſickneſs. At their funerals, among other extravagant tokens of grief, the females, for the death of a favourite ſon, or huſband, or father, ſometimes cut off a finger at the firſt joint. Some of the old women have not a whole finger on either hand. The property of the perſon deceaſed is all deſtroyed, that the ſight of things connected with him may not renew their grief. Theſe ſavages are great gameſters, purſuing the buſineſs ſometimes for a ſucceſſion of days and nights.

In the mountains which ſeparate the waters of the Atlantic and Pacific oceans, are ſeveral chaſms, which emit ſmoke and fire with a ſulphureous ſmell. Finding the ſtreams of the weſt did not tend directly to the ſea, Mr. Mackenzie proceeded by land for a conſiderable time, finding in general a tolerable road or path made by the ſavages. As he advanced nearer the ocean, the ſettlements of the natives were more numerous and permanent; the manner of living more comfortable, the ſtate of ſociety ſomewhat improved: men took a ſhare in domeſtic labours, and women were more reſpected. Architecture was improved; painting and carving had made ſome progreſs. The timber of a houſe was ſeen hewn on two ſides; the end of the ridge-pole was carved in the form of a ſnake's head; the inſides of ſeveral buildings were decorated with painted hieroglyphics. In ſome of their villages are temples ſupported by pillars, carved in the ſhape of men. Theſe are painted black and red. Their waters are ſtored with ſalmon, and they hoſpitably invite the ſtranger to ſhare in their plenty; a variety of berries enrich the feaſt. Copper, iron, and braſs are frequently ſeen near the ſea, which the natives had purchaſed of European ſhips. The ſoil is good; alder trees are 7½ feet in circumference, and 40 feet without a branch; cedars are 24 feet in circumference and proportionably high. Wil-

lows, ſpruce, birch, and hemlock are common. Their canoes of cedar carry 50 perſons. In ſome inſtances, when a perſon dies he is buried till another of the family ſhall deceaſe, then he is taken up and burned, and the other perſon laid in the ſame grave. They believe in a good and evil ſpirit, and have ſeaſons for public and private worſhip. In N. lat. 52° 21′ 33″, and W. long. 128° 2′, Mr. Mackenzie reached the Great Pacific ocean, and with vermilion inſcribed on the ſide of a rock by the ſhore—

"Alexander Mackenzie, from Canada by land, the twenty-ſecond of July, one thouſand ſeven hundred and ninety-three."

NORTHAMPTON, the principal and county-town of Northamptonſhire, England, is memorable in the annals of political and local hiſtory for the number of councils and ſynods held there; for its formidable ancient caſtle, with the provincial earls; alſo for numerous monaſtic foundations, and military events; and laſtly, for its modern improvements and pleaſantneſs of ſituation, as a place of buſineſs or retirement. It may be ſaid to be divided into four almoſt equal parts, by two ſtreets running eaſt and weſt, and north and ſouth. Both theſe ſtreets are wide and commodious, and each extends nearly a mile in length. Moſt of the houſes are built of a reddiſh-coloured ſand-ſtone, dug from quarries in the neighbourhood; but ſome are conſtructed with ſtone of a yellowiſh tint, and a few are brick buildings. At the eaſtern extremity of the town a pleaſant walk has been made, which is called Vigo Paradiſe Walk, or the New Walk, and was formed at the expence of the corporation. At the lower extremity of it is a ſpring of chalybeate water, and near the upper end is another ſpring of clear water, known by the name of Thomas à Becket's Well. On the north ſide of the town is a tract of land, which, in the year 1778, was an open field of 894 acres; but in that year an act of parliament for encloſing it was obtained. About 129 acres of this were then allotted to the freemen of the town, for cattle, &c.: but it was provided in the act that the ſame may be claimed and uſed as a race-courſe for any two days between the 20th of July and the 20th of October.

*Ancient Hiſtory.*—It is ſtated that a town was formed at this place during the Anglo-Saxon dynaſty, and that the ſame was attacked, plundered, and burnt by the Danes, in their different predatory incurſions into this part of the iſland. The Northumbrians, under earl Morcar, took poſſeſſion of this town in the year 1064; and in the genuine ſpirit of ſavage warriors, murdered many of the inhabitants, burnt the houſes, and carried away multitudes of cattle and priſoners. According to records there were then ſixty burgeſſes in the king's lordſhip, and ſixty houſes; but at the era of the Norman conqueſt fourteen of the latter were waſte. By the Domeſday Survey, it appears that there were then only forty burgeſſes in North-hamtune. "William the Conqueror gave to Simon St. Liz, a noble Norman, the town of Northampton, and the whole hundred of Falkely (Fawſley), then valued at forty pounds *per annum*, to provide ſhoes for his horſes." In 1106, the Saxon Chronicle ſtates, that Robert, duke of Normandy, had here an interview with his brother, king Henry I., to compromiſe the differences then ſubſiſting between them. In his twenty-third year, that monarch and his court kept the feſtival of Eaſter at Northampton, with all the pomp and ſtate peculiar to that age; and in the thirty-firſt year of the ſame reign a parliament was held in this town, when the nobles ſwore fealty to the empreſs Maud, on whom the king had ſettled the right of ſucceſſion. In 1138, king Stephen, in order to attach the clergy to his intereſt, a meaſure in thoſe days eſſentially neceſſary, ſummoned a council to meet him at Northampton, when all the biſhops, abbots, and barons of the realm attended, for the purpoſe of making promotions in the church. In 1144, Stephen held his court here, when Ranult, earl of Cheſter, who came to tender his ſervices, was detained as a priſoner till he had ſurrendered the caſtle of Lincoln, and other fortreſſes, as ſecurity for his allegiance, he being ſuſpected of conſpiring with the duke of Normandy againſt the king. When the celebrated ſtatutes of Clarendon were eſtabliſhed (10 Hen. II.) for the good order of the kingdom, and for the better defining the boundaries of eccleſiaſtical juriſdiction; and archbiſhop Becket alone refuſed his aſſent (a refuſal attended with a train of evils, vexatious to the king and fatal to the prelate), a council of the ſtates was convened at Northampton, before which the archbiſhop was ſummoned to appear, and anſwer to the charges of contumacy, perjury, &c. which ſhould then be exhibited againſt him. In the 20th year of this reign, Anketil Mallore, who ſupported prince Henry's unnatural rebellion, marched with a conſiderable force from Leiceſter to Northampton; where, having defeated the Royaliſts, he plundered the town, and returned to Leiceſter with his booty, accompanied by nearly 200 priſoners. In the 26th year of this monarch's reign, a convention of the barons and prelates was aſſembled here to amend, confirm, and enforce the conſtitutions of Clarendon. By this council the kingdom was divided into ſix circuits; and juſtices itinerant were aſſigned to each. From the formation of this convention, the advice of the knights and burgeſſes being required, as well as that of the nobles and prelates, it has been conſidered as the model by which parliaments have been conſtituted in ſucceeding times. The king of Scotland, with the biſhops and abbots of that kingdom, attended this council to profeſs their ſubjection to the church of England. In the 10th of Richard I., Geoffrey Fitzwalter paid 40*s.* to be diſcharged from the inſpection of the coinage here: this is the firſt official mention of a mint at Northampton, though there are reaſons to believe it of greater antiquity. How long it ſubſiſted is uncertain, but mention is made of it in the two ſucceeding reigns. On the death of king Richard, John, his ſucceſſor, being then in Normandy, a great council of nobles aſſembled in this town, and were prevailed on by the adherents of the new monarch to take an oath of fealty to him, and ſupport his claim to the crown. King John, in the 10th year of his reign, having been diſpleaſed with the citizens of London, commanded the exchequer to be removed to Northampton. In his 13th year, in a council of lay nobles convened here, the king met the pope's nuncios, Pandulph and Durand, in order to adjuſt thoſe differences which had long ſubſiſted between him and the holy ſee. The king made large conceſſions; but as he would not, or could not, reſtore to the clergy their confiſcated effects, the treaty was broken off, and the king was ſolemnly excommunicated by the legates. During the reign of Henry III. Northampton was frequently honoured with his reſidence, and with particular marks of his favour: and in the wars between that king and the confederate barons, it was alternately beſieged and poſſeſſed by each of the contending parties. About this time a kind of univerſity was eſtabliſhed here, conſiſting of ſtudents, who at different times, and from various cauſes, had deſerted Oxford. The new ſeminary at firſt was countenanced by the king; but the ſcholars, having taken a decided part in favour of the barons, were commanded to return to Oxford. A ſimilar emigration took place from the univerſity of Cambridge; but was ſoon ſuperſeded by a royal mandate, which compelled the ſtudents to return to their old ſeminaries; and further



provided

provided that no univerſity ſhould ever be eſtabliſhed here. It is, however, a manifeſt indication of the importance attached to Northampton, that both the univerſities ſhould make choice of this place as their aſylum and abode.

On Good Friday, in the ſeventh year of Edward I., the Jews reſiding in this town attempted to crucify a Chriſtian boy, who fortunately ſurvived their cruelty: for this atrocious act fifty of them were drawn at horſes' tails, and publicly hanged. In the preceding year fifty had been hanged for clipping the coin. Theſe, and other enormities, rendered the Jews ſo odious, that in the 18th year of this reign a ſtatute was paſſed for their total expulſion from the kingdom, and for the confiſcation of their property. Edward I. frequently reſided at Northampton in great ſplendour; and on his death a parliament was held here to ſettle the ceremonial of his burial, and the marriage and coronation of his ſucceſſor. Another parliament met here in 1317, in which an impoſtor, John Poydras, ſon of a tanner at Exeter, was brought to trial for affirming that he was the real ſon of Edward I., and that the king was a carter's ſon, and ſubſtituted at nurſe in his ſtead: producing no evidence, however, in ſupport of his aſſertions, he was condemned and executed. In the 11th year of Edward III., the mayor, bailiffs, and burgeſſes of Northampton, obtained the royal licence to hold an annual fair for twenty-eight days; which fair is now diſcontinued. In this reign ſeveral parliaments were held here. The laſt parliament that aſſembled at Northampton was 4 Richard II., when the poll-tax was levied, which cauſed a rebellion, wherein Walter Tyler was the chief. The next memorable event reſpecting this town, was a deciſive battle fought in its vicinity between the Yorkiſts and Lancaſtrians (38 Henry VI.), when that unfortunate monarch was made priſoner. Northampton was viſited by queen Elizabeth in 1563, and by king Charles I. in 1634: it was ravaged by the plague in 1637; and in 1642 was ſeized by the parliamentary forces, by whom it was fortified; the ſouth and weſt bridges being converted into draw-bridges, and additional works thrown up in the defenceleſs places. In the north-eaſt part of the town parts of a foſs and baſtion of earth are yet viſible. The town ſuffered greatly by a flood, May 6th 1663. Northampton has ſuſtained ſome very ſevere loſſes by fire; but theſe have ultimately proved beneficial to the place, for the uniformity and ſubſtantial character of the houſes, width of the ſtreets, and general arrangement of the town, are all to be attributed to thoſe calamitous events. According to Leland's ſtatement, moſt of the houſes were made of wood in his time. On Midſummer day, 1566, a fire deſtroyed ſeveral houſes: but the moſt memorable occurrence of this nature was in the year 1675, when the greater part of the town was conſumed, and many of the poorer inhabitants reduced to great diſtreſs. The general loſs of property was eſtimated at 150,000*l.* Above 600 dwelling-houſes were then burnt, and more than 700 families thereby deprived of their habitations and property. A ſubſcription was ſoon inſtituted, and it appears, by a liſt of benefactions, that above 20,000*l.* were raiſed for the ſufferers.

The town of Northampton was formerly ſurrounded by embattled walls, and was defended by a large fortreſs, or caſtle, and by baſtion towers. In the walls were four gate-houſes, named, from their relative ſituations, Eaſt Gate, Weſt Gate, North Gate, and South Gate. Thoſe towards the ſouth, north, and weſt, had rooms or dwellings over them, and that to the eaſt, according to Bridges, "was the faireſt of all," being lofty, and embelliſhed with ſhields, arms, and other ornaments. Southward of this was a ſmaller gate or poſtern, called the Durn Gate. By an inquiſition taken in the time of Edward I., it appears that the walls were embattled; and at different places had ſteps to aſcend them. Like the walls round the city of Cheſter, theſe ſerved for a public walk; where the infirm and indiſpoſed inhabitants were accuſtomed to "take the air." They alſo conſtituted the beſt foot-path in the winter, from one extremity of the town to another. This walk is reported to have been wide enough for ſix perſons to walk abreaſt. Leland mentions the walls and gates as ſtanding when he viſited Northampton. The ſame topographer ſays, "The caſtel ſtandeth hard by the Weſt Gate, and hath a large kepe. The area of the reſideu is very large, and bullwarkes of yerth be made afore the caſtelle-gate." That ſome fortreſs was erected at Northampton before the Norman conqueſt, may be inferred from the events that occurred here during the Saxon and Daniſh dynaſties; but of that building no accounts have deſcended to the preſent times. It is, however, recorded, that Simon de Senliz, or St. Liz, the firſt earl of Northampton of that name, erected a caſtle here in the reign of William the Conqueror; but as no mention is made of it in the Domeſday Book, it appears not to have been completed till after that ſurvey was taken. It was ſituated on an eminence without the Weſt Gate of the town; and was defended on three ſides by a deep trench or foſs, whilſt a branch of the river Nen ſerved as the natural barrier on the weſtern ſide. In Henry II.'s reign it was poſſeſſed by the crown; and was afterwards entruſted to ſome conſtable or caſtellan appointed by the ſovereign. But in the civil war of 1264, between Henry III. and his nobles, we find it in the occupation of the confederate barons, under the banner of the earl of Leiceſter, whoſe ſon, Simon de Montford, was then its governor. The king having received conſiderable reinforcements from the northern barons, his adherents beſieged the caſtle with great vigour; but its admirable ſituation and ſtrength, with the undaunted courage of the garriſon, compoſed of the fineſt troops in the ſervice of the earl, and, under the direction of officers of diſtinguiſhed ſkill and valour, baffled all the efforts of the royal troops, and convinced them that force was totally inadequate to their arduous enterpriſe. At length they had recourſe to a ſtratagem, not altogether juſt or manly in principle, but which effectually ſerved their purpoſe. While the barons were engaged in a parley, under pretence of negociation, a choſen body of the royal forces was diſpatched to make a breach in the oppoſite wall. The plan ſucceeded: the garriſon, thus taken by ſurpriſe, were, notwithſtanding a brilliant diſplay of courage, completely diſcomfited, and ſurrendered themſelves priſoners of war: in this capitulation were included fourteen of the moſt potent barons and knights bannerets, and forty inferior knights. The caſtle thus reverted to the crown, till, in the 3d year of Edw. III., Thomas Wake, then ſheriff, claimed the cuſtody of it as annexed to the county, and belonging to his juriſdiction; and it being found by inquiſition, then taken, to have been immemorially attached to that office, it was ordered to be given up to be held by the ſaid ſheriff and his ſucceſſors. Within the caſtle was a royal free chapel, dedicated to St. George. Previous to the year 1675, this fortreſs was uſed as the county gaol; and the two courts of juſtice were held here. In 1662, purſuant to an order of the king and council, the walls and gates and part of the caſtle were demoliſhed; and the ſcite of the latter ſold ſoon after to Robert Haſelrig, eſq. in whoſe family it ſtill remains. It appears, indeed, from the account of Norden, that even in the year 1593 the caſtle was much decayed, and the walls defenceleſs. "This towne," ſays he, "is a faire towne, with

with many faire old buildings, large ſtreets, and a very ample and faire market-place; it is walled about with a wall of ſtone, but meane too of ſtrength; neare unto the towne there ſtandeth an eminent caſtle, ruynous." Since Norden's time, moſt of theſe ruins have been ſwept away or levelled: and now only a few fragments of foundation walls, and parts of the foſſes, remain. The inner ballium was nearly circular, and ſurrounded by a lofty wall with baſtion towers at irregular diſtances. This again was encompaſſed by a deep and wide foſs. A broad ballium, or area for the garriſon, extended ſome diſtance, and was guarded by an outer vallum with barbican, &c. The general extent and character of the earth-works may ſtill be traced.

Northampton is both a corporate and borough-town; its firſt charter of corporation appears to have been obtained from king Henry II., but ſince that reign ſeveral other charters, to alter or enlarge the privileges of the corporate body, have been granted. For the firſt of theſe, the burgeſſes gave a fine of 200 marks, to hold the town of the king *in capite*. By a ſubſequent charter from king John, they were exempted from all "toll, laſtage, and murage; alſo from being impleaded out of the town;" and were inveſted with other liberties in as ample a manner as the citizens of London. In theſe privileges they were bound to pay annually into the king's exchequer 120*l*. In the 41ſt year of Henry III. a new charter was obtained, confirming and extending the liberties, &c. of the burgeſſes. Again in the 27th of Edward I., and in the 4th of Henry VII., the charter was renewed and confirmed; and in the 9th year of the latter reign, the mayor, bailiffs, &c. obtained the liberty of chooſing a recorder, and appointing two burgeſſes, who, with the mayor, were inveſted with the powers of juſtices of peace within the town. By a charter bearing date 3d of Auguſt, 15th Charles II., the corporation is ſpecified to conſiſt of a mayor and two bailiffs, and ſuch as have been mayors and bailiffs, with 48 burgeſſes, called common council, recorder, chamberlain, and town-clerk. Though this charter was ſurrendered in 1683, and a new one iſſued, yet the former continued in force till 1796, when an altered, or as it is commonly called, a new charter was obtained.

The recorder and town-clerk uſually continue for life, though ſubject to annual election. This corporation is inveſted with extenſive juridical powers; being qualified to try all criminal cauſes, though they ſeldom extend their juriſdiction beyond petty larcenies. For this purpoſe, therefore, they hold a court of record once in every three weeks. As a borough, Northampton has continued to return two members to the Britiſh ſenate ever ſince the 12th of Edward I., when it ſent two repreſentatives to the parliament held at Acton-Burnel, in Glouceſterſhire. In the firſt year of Edward II. the parliament was held at Northampton; and John de Longueville, and Robert de Bedford, were members for this place. Few boroughs have been more noted in the annals of conteſted election than Northampton, as it is commonly conſidered an open borough: *i. e.* every inhabitant houſholder, paying ſcot and lot, has the liberty of voting. This Mr. Pennant calls "a cruel privilege for ſuch, who have, of late years, been ambitious of recommending their repreſentatives." If cruel to the ambitious, it is certainly important to the humble part of the public, for though corruption, intrigue, and bribery, may ſeduce a few, theſe are not ſo likely to operate on the many. The number of voters is nearly 1000. A memorable election conteſt for this borough occurred in 1768, when the earls of Halifax, Northampton and Spencer were oppoſed to each other; or rather each exerted his reſpective influence to return a member. Never perhaps was bribery ſo extenſively and laviſhly employed: and though all the parties were not poſitively ruined, yet each was materially injured in fortune. It is ſtated that lord Spencer expended above 100,000*l*. and each of the other noblemen nearly 50,000*l*.

*Churches.*—There were formerly ſeven pariſh-churches within the walls of Northampton; reſpectively dedicated to All-Saints, St. Giles, St. Gregory, St. Mary, St. Michael, St. Peter, and St Sepulchre. Beſides theſe, there was St. Catharine's, a chapel of eaſe to All-Saints, in the town; St. Edmund's church, without the eaſt gate, and St. Bartholomew's, without the north gate. Of theſe ſtructures four only are remaining at preſent, into which number of pariſhes the town is divided; All-Saints, St. Giles's, St. Peter's, and St. Sepulchre's. The church dedicated to All-Saints, ſituated about the centre of the town, having been conſumed by fire in 1675, was begun to be rebuilt ſoon afterwards, and was completed in the year 1680, and the firſt ſermon was preached by the biſhop of Peterborough, Sept. 5th. 1680. The interior of this is very unlike the generality of churches. The windows and architectural ornaments are neither Gothic, Grecian, nor of any regular order or ſtyle. It conſiſts of one large room or ſpace, with a ſquare chancel at the eaſt end, and a tower at the weſt end: near the centre are four large columns ſupporting a flat roof, from which riſes a dome or cupola. Attached to the weſt end of the church is a tablet recording the name of John Bailes, who was born in this town, and lived to a very advanced age; retaining his faculties of "hearing, ſight, and memory to the laſt. He lived in three centuries, and was buried the 14th of April, 1706." Bridges obſerves, that "his age appears to have been aſſigned conjecturally to 126; he was at moſt but 114 years old." After his death he was diſſected by Dr. James Keill, who publiſhed an account of the appearances, &c. of the corpſe, in the Philoſophical Tranſactions, N° 306, art. 8.

St. Giles's church is ſituated near the eaſtern end of the town, immediately within the ancient town-wall. This is a large pile of building, and conſiſts of a nave, aiſles, tranſept and tower riſing from the centre. At the weſt end is an ancient door-way, with a ſemicircular arch, and Norman mouldings.

St. Peter's church is ſeated at the weſtern extremity of the town, in the vicinity of the caſtle, and was probably erected by one of the firſt Norman earls of Northampton. From the regiſter of St. Andrew's priory in this town, it appears that the rectory of St. Peter's was given to that monaſtery by Simon de St. Liz, and was confirmed to it with the chapelries of Kings-thorpe and Upton, by Hugh Wells, biſhop of Lincoln. The architecture of this church is curious and intereſting. In ſome particulars it may indeed be conſidered an unique edifice. It conſiſts of a nave and two aiſles of equal length, having ſeven columns on each ſide, three of which are compoſed of four ſemi-columns. The four ſingle ſhafts are ornamented with ſtone bands, of four mouldings near the centre; but the cluſtered columns, which ſeemed more to require this appearance of binding, have no ſuch appendage. All the capitals are charged with ſculpture of ſhell-work, heads, animals, &c. Theſe capitals have lately been cleaned, and the rich and curious ſculpture with which they are charged is fully diſplayed. This arduous and laudable taſk was performed by Miſs A. Baker of Northampton. On each ſide of the nave are eight ſemicircular arches, with indented zigzag mouldings on the face and ſoffits. Over theſe was a ſeries of ſix ſmall windows, with ſemicircular heads on each ſide. But the moſt decorated and curious part of the interior of this ſingular ſtructure, is the great archway,

archway, beneath the tower, at the weſtern end of the nave. This conſiſts of three receding arches, each charged, both in elevation and ſoffit, with zigzag mouldings. On each ſide of the archway are three pilaſter columns, ſome of which are ornamented with ſpiral and lozenge mouldings. The exterior of the church and tower is equally curious, though the architectural and ſculptural decorations are not ſo profuſe or elaborate. At the ſouth-weſt and north-weſt angles of the tower are buttreſſes of peculiar form. Each conſiſts of three ſemi-columns, gradually diminiſhing at every ſtory. On the north and ſouth ſides of the ſame are two ſeries of arcades; and at the weſt end one range correſponding; with a blank arch, having three rows of flat ſtones, charged with varied tracery in the pannels.

St. Sepulchre's church, near the northern extremity of the town, is another ſingular and curious ſpecimen of the eccleſiaſtical architecture of England. This alſo, like St. Peter's, may be conſidered unique, having ſome features and peculiarities unlike any other of the country. It conſiſts of a ſquare tower with a ſpire at the weſt end; a circular part, and a ſquare eaſt end, of three aiſles. This and the tower are additions, of a comparatively modern date to the original edifice. Part of the circular building is evidently very ancient, probably before A.D. 1200; but various alterations have been made at different times. Within a circular exterior wall, is a ſeries of eight columns alſo diſpoſed in a circle. From theſe ariſe eight arches in the pointed ſtyle, but completely plain and unadorned. Over the columns the wall aſſumes an octangular ſhape. Four of the pillars have ſquare baſes and capitals, whilſt thoſe of the others are circular. A ground plan, or elevation of one ſide of the nave, a perſpective view of the interior, and another of the exterior, with a hiſtory and deſcription of this edifice, are publiſhed in the ſecond volume of the Architectural Antiquities of Great Britain.

Northampton formerly contained ſeveral monaſtic eſtabliſhments and edifices, but few of theſe are now remaining. The priory of St. Andrew was ſituated at the north-weſtern part of the town, near the river, and was founded anterior to the year 1076; for in 1084 Simon de St. Liz repaired the buildings, and augmented the endowments.

The Franciſcans, or Grey friars, had an eſtabliſhment in Northampton ſoon after their coming into England. They originally hired an habitation in St. Giles's pariſh, but afterwards built one on ground given them by the town in the year 1245. Near this houſe was a priory of Carmelites, or White friars, founded in 1271, by Simon Mountfort and Thomas Chetwood.

The Dominicans, or Black friars, were ſettled here before 1240. John Dalyngton was either founder, or a conſiderable benefactor to this eſtabliſhment.

William Peverel, natural ſon to the Conqueror, founded here, before 1112, a houſe of Black canons, in honour of St. James.

The Auſtin friars, or Friars Eremites, had a houſe in Bridge-ſtreet, founded in 1332, by ſir John Longueville, of Wolverton, in Buckinghamſhire; and ſeveral perſons of his name were interred here.

The college of All-Saints was founded in 1459, with liberty of purchaſing to the value of 20 marks. It conſiſted only of two fellows.

The hoſpital of St. John, for women, an ancient building in Bridge-ſtreet, conſiſts of a chapel, a large hall, and other apartments. It was founded for the reception of infirm poor perſons, probably by William St. Clere, archdeacon of Northampton, who died poſſeſſed of that dignity in 1168.

Near this place, cloſe to the ſcite of the ſouth gate, is St. Thomas's hoſpital for women, founded in 1450, in honour of St. Thomas Becket. It was firſt endowed for twelve poor people, but an additional revenue was granted by ſir John Langham, in 1654, for ſix more.

Among the public buildings and eſtabliſhments of the town, none is of greater utility or larger ſize than the General Infirmary, which was begun in 1791, and opened in 1793. It ſtands on the eaſtern ſide of the town, but detached from it, on the brow of a hill which gradually ſlopes to the ſouth. The building, which coſt about 10,000*l.* conſiſts of three ſtories above ground, and one beneath, and is admirably diſpoſed for the reception and accommodation of the ſick. One ſide of the houſe is appropriated to male, and the other to female patients. The whole was deſigned and built by Mr. Saxton, architect, and is faced with ſtone from the Kings-thorpe quarries, the proprietor of which made a preſent of the whole. The eſtabliſhment is ſupported by the intereſt ariſing from numerous legacies, and from annual ſubſcriptions. According to the report of the committee in Auguſt, 1809, there appear to have been cured during the preceding year, "1859 in and out-patients," and ſince the firſt opening of the infirmary, in 1744, there have been 44,147 perſons "perfectly cured," beſides 5780 who had received "great benefit." Excluſive of medical and ſurgical aid, the eſtabliſhment provides, what are no mean auxiliaries in the cure of diſtempers, *proper accommodations, conſtant attention, with wholeſome and nutritious food.* "In our charitable abode," ſays the committee, "nothing is denied that can any way promote recovery."

Near All-Saints church is the old county gaol, now converted into the turnkey's lodge and debtor's priſon. It was originally built by ſir Thomas Haſlewood as a private houſe. Behind this is the new gaol, which was begun in 1791, and finiſhed in 1794.

The town-gaol in Fiſh-lane is a ſmall modern building.

Near the eaſt end of All-Saints-church is the county-hall, or ſeſſions-houſe, a large room fitted up for the two courts of niſi prius and crown.

At the northern extremities of the town is a range of modern buildings, erected in 1796, and appropriated to barracks. A new theatre has been built in Gold-ſtreet.

*Schools.*—A blue-coat ſchool was eſtabliſhed here about the year 1710, by John Dryden, eſq. of Cheſterton. There are alſo a brown-ſchool, a green ſchool, and a girl's ſchool, eſtabliſhed in this place, Latterly there have been ſchools eſtabliſhed here on Lancaſter's and Bell's plans.

In the year 1778, an act of parliament was obtained for paving, lighting, watching, &c. the town; but this being found inſufficient, a new act was procured in 1797. To carry this into effect, the commiſſioners expended about 10,000*l.*, to meet the intereſt of which, a rate of 1*s.* 6*d.* in the pound is levied on the rental of the houſes. In conſequence of this act, nearly all the ſtreets and lanes of Northampton are paved, both for carriages and for foot-paſſengers; and as the town is chiefly built on the ſlope, and near the top of a hill, it is generally clean and pleaſant. Near its centre is a large open area, ſurrounded by ſhops and private houſes, called the ſquare, or market-place. In the town are ſeveral chapels, appropriated to different ſects or religious ſocieties. That called the Caſtle-hill meeting, is a large, commodious building, and belongs to the Independents. The juſtly celebrated Dr. Doddridge preached here for 22 years, and alſo ſuperintended an academy, which, by his learning and judicious management, obtained conſiderable reputation.

Another meeting-houſe for Independents was erected here

in 1776, in which are ſeveral ſmall but handſome monumental memorials. The Baptiſts' meeting, a large building, was formerly noted by the preaching of the Rev. S. Ryland, who officiated in it for ſome time, and was buried here. The Moravians, Methodiſts, and Quakers have alſo chapels in the town. In the year 1811, this town was found to contain 1623 houſes, and 8427 inhabitants.

Northampton has given birth to ſome perſons of eminence, who may properly be claſſed among the worthies of the county. Richard and Adam of Northampton were both born here, and both were advanced to the epiſcopal ſee of Ferns, in Ireland; the firſt in 1282, and the ſecond in 1322.

John of Northampton, or, according to his Latin name, Joannes Avonius, was a Carmelite friar in this his native place. He was the inventor of the *Philoſopher's Ring*, a kind of perpetual almanac.

Dr. Samuel Parker, biſhop of Oxford, was a native of this place; as were Dr. Thomas Cartwright, biſhop of Cheſter; William Beaufu, a Carmelite friar; and Robert Brown, the celebrated founder of the Browniſts.

About one mile ſouth of Northampton, on an elevated bank adjoining the public road, is an elegant ſtone croſs, which was erected by king Edward I., in memory of his deceaſed queen Eleanor. This intereſting monument of ancient architecture and conjugal affection, has been already noticed in a preceding volume of our work under the word Cross. On the ridge of a hill weſt of this place is an ancient encampment, called Hunſborough, of nearly an oval form, conſiſting of a double vallum, with a ſingle foſſe, and containing an area of about one acre. One mile S.W. of Northampton is Delapre abbey, the ſeat of Edward Bouverie, eſq. The preſent houſe occupies the ſcite of a nunnery, which was founded in the time of king Stephen, by Simon de St. Liz, jun. earl of Northampton. In the neighbouring village of Hardingſtone was born James Harvey, author of "Meditations among the Tombs," &c. Hiſtory and Antiquities of Northamptonſhire, by J. Bridges, eſq. and the Rev. P. Whalley, 2 vols. folio. Beauties of England, vol. xi. by J. Britton, and the Rev. J. Evans.

Northampton, a large uneven county of Pennſylvania; in the N.E. corner of the ſtate, on Delaware river, which ſeparates it from New Jerſey and New York; it is divided into 27 townſhips, and contains 30,062 inhabitants:—Alſo, a townſhip in Buck's county, Pennſylvania, including 942 inhabitants.—Alſo, a town in Northampton county, Pennſylvania, on the S.W. bank of Lehigh river, five or ſix miles S.W. of Bethlehem, containing 573 inhabitants.—Alſo, a county of Halifax diſtrict, North Carolina, bounded N. by the ſtate of Virginia, containing 12,331 inhabitants, of whom 6206 are ſlaves.—Alſo, a maritime county of Virginia, on the point of the peninſula, which forms the E. ſide of the entrance into Cheſapeak bay; having the ocean E., and Accomack county N.; its ſouthern extremity being Cape Charles, in N. lat. 37° 11′, and W. long. 75° 57′, off which is Smith's iſland. This county, the lands of which are low and ſandy, contains 3585 inhabitants, and 3178 ſlaves. In this county is "Northampton court-houſe," 40 miles S.S.W. of Accomack court-houſe; 43 miles N.E. of Norfolk.—Alſo, a reſpectable poſt-town and capital of Hampſhire county, Maſſachuſetts, ſituated within a bend of Connecticut river, on its W. ſide; 40 miles N. of Hartford; and containing a ſpacious congregational church, a court-houſe, gaol, and about 250 dwelling-houſes, of which many are handſome buildings. Its meadows are extenſive and fertile; and it carries on a conſiderable trade. This townſhip was incorporated in 1685, and contains 2190 inhabitants.—Alſo, a townſhip in Burlington county, New Jerſey, comprehending about 56,000 acres, half improved and half moſtly pine-barren. The chief place is "Mount Holly." It contains about 150 houſes, an epiſcopal church, a Friends' meeting-houſe, and a market-houſe; 22 miles from Trenton.

NORTHAMPTONSHIRE, a county of England, and nearly in the centre of the iſland, is bounded by Leiceſterſhire, Rutlandſhire, and Lincolnſhire on the north; by Cambridgeſhire, Bedfordſhire, and Huntingdonſhire on the eaſt; by Buckinghamſhire and part of Oxfordſhire on the ſouth; and the Charwell ſecures it from another part of Oxfordſhire, whilſt the river Leam, for a ſhort diſtance, and the old Roman Watling-ſtreet, ſeparate it from Warwickſhire on the weſt. The extent of Northamptonſhire may be eſtimated at nearly 66 miles in its longeſt diameter, *viz.* from its moſt weſtern verge at Aynho to the remoteſt north-eaſtern limit near Crowland. Its greateſt breadth, from Hargrave in the eaſt to Barby in the weſt, is eſtimated at about 30 miles; yet its average width, perhaps, is not 20 miles; and from Brockley acroſs to Aſtrop in the ſouth, alſo from Peterborough in a northerly direction to Peakirk, it does not exceed eight miles. The circumference may be conſidered 216 miles, and the ſuperficial area of the whole has been computed at 550,000 acres; but the lateſt authorities referred to in the poor returns to parliament, ſtate it to be 617,000 acres, of which 290,000 are ſaid to be arable; 235,000 in paſturage, and about 86,000 uncultivated, including woodlands. It contains 1 city, 11 market-towns, 336 pariſhes, and, according to the population return of 1811, there were then 28,995 houſes, and 141,353 inhabitants.

At the time of the general Norman ſurvey, there were 30 hundreds and wapentakes in the county of Northampton, as we find them recorded in Domeſday Book. When this ſurvey was made, a conſiderable part of Rutlandſhire was included in the county of Northampton; but in the fifth year of king John we have mention made of it as a ſeparate ſhire; and by an inquiſition taken in the fourth of Edward I. it was certified to have been given by Henry III. to the king of Almains. By a later diviſion the hundreds were reduced to twenty-eight, and in the reign of Edward II. they were further contracted to the preſent number of twenty, and were called by the names which they now bear; ten being comprehended in the eaſtern diviſion of the county, and ten in the weſtern.

*Roman Antiquities*, &c.—When the Romans took poſſeſſion of the central part of Britain, they found it occupied by a tribe of people known by the name of Coritani; theſe being ſubjugated, their conquerors ſoon began to form military roads and fortreſſes. Two great roads, or via-ſtrata, croſſed the county; and were directly, or collaterally, connected with ſeveral permanent ſtations, temporary encampments, and vicinal ways. The Watling-ſtreet, in proceeding from the ſouth towards the north, enters Northamptonſhire at or near Stratford, and, continuing in almoſt a direct line acroſs the county, leaves it at Dove-bridge. On this courſe there appears to have been three ſtations, as mentioned both in the ſecond and ſixth Iters of Antoninus; and alſo in the Itinerary of Richard of Cirenceſter. Theſe were Lactodorum, 17 Roman miles from Magiovinium, Bennavenna, or Iſannavotia, 12 miles from the firſt; and Tripontium, 12 miles diſtant from the latter. Much difference of opinion has prevailed among antiquaries reſpecting the ſcites of theſe ſtations; and it will not be an eaſy taſk to reconcile the diſputes of thoſe who argue from maxims of theory rather than

than the evidence of remains, ſituations, and probable deſcriptions. From the known and indiſputable ſtation of Verulam, St. Alban's, the Watling-ſtreet, in its progreſs northward, paſſed Durocobrivis, near Dunſtable, and Magiovinium in the vicinity of Stratford. From this to Lactodorum was 17 miles, which diſtance, with the name ſtill retained of Towceſter, and the veſtiges of the place, are tolerably ſatisfactory proofs as to the ſcite of this ſtation. The biſhop of Cloyne ſays that Towceſter, unequivocally, "muſt have been the Lactodorum." The next Roman town on this road was Benaventa, or Bennavenna, which has been placed at Wedon-Bec, at Caſtle-Dykes, and near Daventry; but the ſuperior claims of the latter are deciſive from a mere curſory view of each place. Here is the immenſe encampment called Borough-Hill; alſo the remains of other fortifications named Burnt-Walls, &c. in a valley to the weſt. In an adjoining wood, cloſe to the preſent turnpike road, are other military works, called John of Gaunt's caſtle, which probably conſtituted part of the Roman ſtation. Twelve miles north of this was Tripontium, a name deſcriptive of its ſituation and character. This ſtation is uſually aſſigned to Lilburn, where is a conical, artificial hill, poſſibly the keep of a fortreſs, and ſome caſtrametations. Cauſeways, pavements, and other ancient veſtiges, have been found here.

Beſides the ſtations and roads already noticed, there appear to have been other works of the Romans on the weſtern ſide of this county. The great encampment called Caſtle-Dykes, ſouth-weſt of Wedon, appears to have been either formed or altered by the Romans. It was a fortreſs of great ſtrength and magnitude. About three miles to the eaſt is Nethers Heyford, where part of a teſſellated pavement was diſcovered in 1699. This was, however, only a fragment of a common floor, though Moreton deſcribes it as "a noble piece of art, exceeding all that I have ſeen or read of."

About three miles ſouth-weſt of Daventry is Arbury Banks, a large encampment on the ſummit of a hill. Moreton and Reynolds attribute this to the Romans; and the former deſcribes it as being on "one of the higheſt hills in the county." At Guilſborough are ſome entrenchments called "The Boroughs," which Dr. Stukeley pronounced to be "traces of a Roman camp." In the ſouth-weſtern angle of the county, between the village of Aynho and Newbottle, is another entrenchment, called Raynſbury camp. From what has been already ſtated, it is evident that the weſtern ſide of Northamptonſhire abounded with military poſts during the Roman colonization of England; and from reviewing this diſtrict with the parts of Warwickſhire and Oxfordſhire immediately adjoining, we ſhall find ſuch other traces of the Romans, as may ſerve to develope their general ſyſtems of military and political tactics. In nearly a direct line ſouth from Raynſbury camp, in the county of Oxford, the remains of a Roman road, called the Porkway, point towards Aldceſter and Cheſterton; and nearly parallel with that ſtreet, is a raiſed mound named Aveditch-bank. Theſe appear to have formed a communication between the fortreſs of Cheſterton, and that of Raynſbury: it is, indeed, extremely probable that the ſame road continued to, and formed a connecting line with, the other great works at Caſtle-Dykes, Borough-Hills, &c.

For the other ancient remains which may be ſtrictly attributed to the Romans, we ſhall refer to the eaſtern ſide of the county, where the Roman road called the Forty-foot-way, or Ermine-ſtreet, is found. This enters the county from Huntingdonſhire near the village of Caſtor, where it paſſed the Nen river. Parts of this road are ſtill lofty and conſpicuous between Caſtor and Upton; and again in the pariſh of Barnack. The only ſtation in this county on the line was Durobrivæ, which was at or near Caſtor.

In order to ſhew that the Romans occupied places and eſtabliſhed permanent habitations in other parts of the county, it will be ſufficient to point out the ſpots where veſtiges of thoſe people have been found. The moſt conſiderable of their remains are ſome teſſellated pavements, or floors of different rooms, which were found at Weldon in the year 1738. The plan diſplayed a long gallery about 90 feet by 10; which communicated with ſeven other apartments. The whole formed nearly a parallelogram of 100 feet by 30; and conſiſted of foundation walls and floors made of teſſeræ, laid in the common patterns. Numerous coins of the lower Roman empire, and ſeveral of Conſtantine, Conſtans, &c. were diſcovered at the ſame time.

At Cotterſtock, near Oundle, a teſſellated pavement was found in the year 1736. It meaſured about 20 feet ſquare; and among the rubbiſh were found fragments of urns, with ſhells, tiles, horns, and bones of beaſts. In the year 1798 ſome further diſcoveries were made in the ſame field; conſiſting of one pavement nearly perfect, and fragments of others; alſo ſeveral coins, &c.

At Thorpe, near Peterborough, Dr. Stukeley ſays that a Moſaic pavement was found; and at Stanwick, near Higham-Ferrers, Bridges deſcribes a teſſellated floor to have been found. The names of Ilcheſter and Cheſter near Wellingborough, induce us to expect ſomething Roman there, and accordingly we find the remains of an encampment at Cheſter, of nearly a ſquare form, which included an area of about 20 acres within its outer banks. Parts of brick pavements, coins, foundations of walls, and other ancient relics, have been found at this place, which is on the banks of the river Nen.

Near the ſame river in Woodford field are "manifeſt ſigns," according to Moreton, "of a place poſſeſſed by the Romans." Fragments of teſſellated pavements, an urn, and ſome other remains have been found at this village.

Such are the chief veſtiges which have been diſcovered relating to the Romans in this county; and from theſe it is evident, that nearly the whole of the open parts of it was ſubſervient to their military domination. On the banks of the Nen and Welland, it is probable that they occupied other fortreſſes and villas; but theſe have never yet been ſufficiently explored, or the entrenchments ſatisfactorily deſcribed.

*Saxon and Norman Eras, Encampments and Caſtles.*—Soon after the Saxons had uſurped poſſeſſion of Britain, they ſubdivided it into different kingdoms or ſtates; and the preſent county was included within the Mercian monarchy. Under this the great monaſteries of Medenhamſtead, now Peterborough, and Croyland in the ſame diſtrict, were founded. Indeed the former was the firſt, in the time of formation, and moſt important in ſize and conſequence within the kingdom of Mercia; and this, like its neighbour at Croyland, was plundered and burnt by the Danes in their different predatory excurſions into this part of the iſland. Medenhamſtead, however, became ſo famous, that it was called Urbs-Regia, the royal city; and juſt before the Roman conqueſt it was pre-eminently diſtinguiſhed by the title of Aurea Civitas, or golden city. From king Wulfere's charter of endowments and privileges to this monaſtery, dated 664, we learn that ſeveral places in the vicinity were tributary to it. Among theſe, the following names of towns and villages occur, Wansford, Cliff, called King's Cliff, Eſtune, now Eaſton, and Northborough. Other places are named in king's Edgar's charter, anno 972.

Oundle, then called Undale, is recorded in the Saxon Chronicle, A.D. 709, when biſhop Wilferth died there. In Edgar's charter this place is mentioned as a market-town of conſiderable note.

At Stamford Baron the monks of Medenhamſtead kept a monetarium, or mint.

It is not only probable, but well authenticated, that the Saxons, Danes, and Normans alternately and ſucceſſively took poſſeſſion of the chief Roman ſtations, and adapted them to their reſpective modes of attack and defence. In this county Toſeceaſter, or Towceſter, was burnt by the Danes, but king Edward ordered it to be rebuilt, and about the ſame time it was encompaſſed with a wall of ſtone.

*Eccleſiaſtical Hiſtory*, &c.—During the Saxon dynaſty, this county was under the epiſcopal juriſdiction of Dorcheſter, in Oxfordſhire, and after the year 1072 ſubject to that of Lincoln. It continued a part of that dioceſe, till Henry VIII., having ſeized the temporalities, and ſeculariſed the abbey of Peterborough, appointed this town and church as one of the new ſees in the year 1541; at the ſame time he ordained, by letters patent, that it ſhould conſiſt of a biſhop, a dean, ſix prebendaries, and an archdeacon. A further account of the cathedral and its eſtabliſhments, with ſome particulars of the biſhops, will be given under the head PETERBOROUGH.

*Geographical Features*, *Natural Hiſtory*, *Rivers*, *Canals*, *Foreſts*, &c.—At a former period the greateſt portion of Northamptonſhire was occupied by the foreſts of Salcey, Whittlewood, and Rockingham; and theſe ſtill cover above 18,000 acres of land. This ſpace, however, is not wholly devoted to woods. For within the boundaries numerous deer, cattle, horſes, and ſheep are fed. Many of theſe are afterwards fattened on the rich grazing lands of the county and then ſent to the London markets. The prevailing ſyſtem of huſbandry is grazing, and many of the farmers are juſtly noted for their ſkilful management, both of their land and ſtock.

The ſurface of this county is peculiarly advantageous for cultivation, having neither dreary waſtes nor rugged mountains; but is every where ſufficiently regular for all the purpoſes of huſbandry and tillage. Every hill is cultivated, or may be kept in a profitable ſtate of paſturage, and every inequality in the ſurface contributes to its ornament and beauty. The upper and middle parts of the county are abundantly covered with extenſive woods, which are interſected with numerous viſtas and lawns.

Mr. Donaldſon, in his "General View," ſtates, that there are 316 pariſhes in this county, 227 of which are in a ſtate of incloſure, and 89 in open field; beſides which, there are many thouſand acres of woodlands, and a large tract of rich, valuable land, called the Great Peterborough Fen, in a ſtate of commonage; ſo that ſuppoſing the incloſed part of the county under the moſt approved modes of management, there is above one-third of the whole, by no means in the beſt ſtate of cultivation, of which it is ſuſceptible. Without enumerating the various ſmall commons, or the nature and extent of the common rights of paſturage, it may be ſufficient to mention particularly the Great Peterborough Fen, a tract of fine level land, containing between ſix and ſeven thouſand acres of a ſoil equal perhaps to any in the kingdom, and capable of the higheſt cultivation. It is ſituated between Peterborough and Croyland, towards the north-eaſtern angle of the county, and is ſubject to the diſpaſturage of the cattle, horſes, and ſheep of thirty-two pariſhes, or townſhips, which comprize what is commonly called the Soke of Peterborough. The right of commonage is conſidered to be ſcarcely of any value, but if this portion of land was converted into private property, and divided into farms of a proper ſize, advantages both of a public and private nature muſt neceſſarily be the reſult.

*Woodlands*.—The extenſive tracts of woodlands in this county conſiſt either of foreſts, chaſes, or purlieu woods. Of the foreſts, the principal is that of Rockingham, which is ſituated in the northern part of the county, and extends for nearly twenty miles in one direction. The two large foreſts of Whittlewood and Salcey lie towards the ſouthern border of the county. There are two chaſes, Geddington and Yardly; the former was once a part of Rockingham foreſt; but permiſſion was given by the crown, many years ſince, to the anceſtors of the Montague family to diſafforeſt it, and convert it into a chaſe. Yardly chaſe was once a part of Salcey foreſt, but has alſo been diſafforeſted. Purlieu woods are thoſe which are ſituated in the vicinity of the foreſts, and which at one time formed a part of them; but the reſpective owners, having at ſome former periods obtained grants from the crown to diſafforeſt them, and to conſider them as their own private property, they are not now ſubject to any of the regulations of the foreſt woods. The purlieu woods are numerous and extenſive in this county, particularly towards the ſouthern ſide, and upon the borders of Rockingham foreſt; and beſides theſe, there are ſeveral ſmall tracts of woodland very advantageouſly ſituated in various parts of the county. The underwood in the foreſts and chaſes principally conſiſts of black and white thorn, aſh, ſallow, maple, and a ſmall proportion of hazel. As the hiſtory, extent, rights, and peculiarities of the foreſts, conſtitute a natural feature in the topographical annals of this county, it will be requiſite to detail them more fully.

The foreſt of Salcey is ſituated near the ſouth-eaſtern border of the county, where it joins Buckinghamſhire. From a perambulation made in the time of king Edward I., it appears, that the limits had been extended by king John; but that the woods and lawns, afforeſted by that monarch, were diſafforeſted by Edward, according to the tenour of the Charta de Foreſta, and in conſequence of a grant of a fifteenth part of the moveables of all his ſubjects.

The lands now conſidered as foreſt, and in which the crown is poſſeſſed of the timber and other valuable rights, extend in length about two miles and a half, and in breadth nearly one mile and a half, and contain 1847 acres, 23 poles. The whole is divided into four walks, *viz.* Hanſlop, Piddington, Hartwell, and the Deputy Ranger's walk. By the cuſtom of this foreſt, the underwood of the ſeveral coppices is cut in rotation at twenty-one years growth; and after each cutting the coppices are incloſed ſo as to exclude the commonable cattle of the foreſt for nine years; but the deer are admitted into them two years ſooner by means of creeps and deer leaps made in the fences. At the end of nine years they are again thrown open, and continue ſo the remaining twelve years, until the period of cutting the underwood returns. This foreſt is under the government of the following officers, *viz.* a warden or maſter foreſter, lieutenant or deputy warden, two verderers, a woodward, three yeomen-keepers of the ſeveral walks of Hanſlop, Piddington, and Hartwell, one page keeper, and the ſurveyor general of the woods and foreſts.

The number of deer kept in this foreſt is about 1000 of all ſorts; and the number killed annually is about 28 brace of bucks, and 20 of does; of which four bucks and four does are ſupplied for the uſe of his majeſty's houſhold, in purſuance of warrants from the board of green cloth.

In

In a ſurvey taken in 1783, there were reported then to be in this foreſt only 2918 oak trees fit for the navy, (including all trees down to 30 feet of timber,) containing by computation 3745 loads of timber, ſquare meaſure; and only 194 ſcrubbed, dotard, or defective trees of above 30 feet each; beſides browze trees, of which there were 8266 oak trees, containing by computation 7338 loads of timber, ſquare meaſure, and 8914 browze aſhes: ſo that the timber fit for the navy, according to this ſurvey, was little more than one-tenth part of the quantity fit for naval uſe, growing in this foreſt in 1608.

The foreſt of Whittlewood, though principally belonging to the county of Northampton, extends into the adjoining counties of Oxford and Buckingham, and has been formerly of very conſiderable extent. This foreſt, as well as that of Salcey, is part of the honor of Grafton. A perambulation made in the reign of Edward I., deſcribes ſeparately the parts lying within the three counties above named. The bounds of the foreſt, and the operation of the foreſt laws, were greatly extended in the 15th of Charles I.; but an act of parliament, in the next year, reſtored the ancient limits, as preſcribed by the perambulation of Edward I., and confirmed, 20 James I. But a part only of the lands within thoſe limits ſeems now to be conſidered as foreſt: that part contains 5424 acres, 1 rood, 11 poles, and is almoſt entirely encompaſſed with a ring mound, which has been its boundary beyond the memory of the oldeſt man.

The whole is divided into five walks, *viz.* Hazelborough, Sholbrook, Wakefield, Hanger, and Shrobb: the firſt ſituated in the pariſhes of Whitfield and Silverſtone; the ſecond in that of Whittlebury; the third in the pariſhes of Whittlebury, Potterſbury, Paſſenham, Denſhangen, and Lillington Dayrell; the fourth and fifth in the pariſh of Paſſenham. By grant of 11 Ann, the duke of Grafton holds the office of lord warden, or maſter foreſter, which gives him the poſſeſſion of the chief lodge, called the Wakefield Lodge, with the gardens, pleaſure-grounds, and incloſed meadow-lands, containing together nearly 117 acres, with the paſturage for cattle, in common with the dean, in an incloſed lawn, called Wakefield Lawn, containing upwards of 245 acres. His grace has alſo, as hereditary keeper, the cuſtody and management of the deer. No more, however, ſeems to have been required from his family, ſince the date of the patent, than to anſwer certain warrants for the ſupply of his majeſty's houſhold, and the public offices, or others accuſtomed to have veniſon from the royal foreſts. The reſidue appears to have been left to the diſpoſal of the lord warden.

The number of deer at preſent kept within the foreſt is computed to be about 1800 of all ſorts; and the number killed, one year with another, is about 138 bucks, and 100 does.

In the ſurvey made in the year 1608, Whittlewood foreſt is ſtated to contain 51,046 timber trees of oak, then valued at 25,755*l.*, and 360 decaying trees, valued at 123*l.* 6*s.* 8*d.* The quantity of timber is not mentioned; but, according to the computation mentioned in Salcey foreſt, it muſt have been from 40 to 50,000 loads, girt meaſure, or from 60 to 75,000 loads, ſquare meaſure.

By the ſurvey taken in 1783, there appeared to be growing in this foreſt 5211 timber trees fit for the navy, containing 7230 loads of timber, ſquare meaſure; and 402 ſcrubbed, dotard, and decayed trees, containing 569 loads. The ſame ſurvey ſtates, that there were 18,617 trees in the foreſt conſtantly lopped for browze for the deer, *viz.* 6335 oak trees, computed to contain 8907 loads of timber, ſquare meaſure, (being more than a load and quarter each on the average,) and 12,282 aſh trees, containing 3512 loads; ſo that the number and contents of the browzed oaks was greater than of the oak trees reported to be fit for the navy, of which the number in the coppices was not quite three trees to every two acres of land.

The foreſt of Rockingham is ſituated in the northern part of the county, and is eſteemed to have been formerly one of the largeſt foreſts in the kingdom. In a perambulation, dated the 14th of Edward I., it is deſcribed as extending from Northampton to Stamford, being about 30 miles in length; and from the river Nen on the ſouth to thoſe of the Welland and Maidwell on the north-weſt, being a medium breadth of nearly eight miles. This extent was limited ſoon after the acceſſion of Henry II.; but the bounds were particularly ſpecified and ſettled in the 17th of Charles I. The foreſt conſiſts of three ſeparate diſtricts, called the bailiwicks of Rockingham, Brigſtock, and Clive, or Cliffe, ſituated at the diſtance of between two and four miles from each other. Theſe three bailiwicks were formerly under the ſuperintendance of one warden or maſter foreſter of the whole foreſt; which office was granted, in the 1ſt of James I., to Thomas, lord Burleigh, for three lives. Charles I. divided, or rather aboliſhed, that office, and conſtituted three maſter foreſters of ſeparate diſtricts. The maſter foreſterſhip of Rockingham bailiwick, with Geddington woods, was granted to Edward, lord Montague, for three lives; but no ſubſequent grant of it appears. That of Cliffe bailiwick was granted, in the 5th of Charles I., to truſtees for Mildmay, earl of Weſtmoreland, for three lives, and is now held by the preſent earl of Weſtmoreland on the ſame tenure; and that of Farming woods, the patent for which was not ſued out in that reign, was granted, in the 27th of the next, to ſir John Robinſon for three lives, and is now held by the earl of Upper Oſſory. The other officers of this foreſt, in the reigns of James I. and Charles I., beſides the warden, were a lieutenant, four verderers, a ranger of the foreſt, and under-ranger of each bailiwick, a bow-bearer, maſter keepers, and under-keepers of the reſpective walks, and twelve regarders for each bailiwick, beſides woodwards and under-woodwards.

The bailiwick of Rockingham compriſes divers extenſive woods in the pariſhes of Cottingham, Middleton, Great and Little Oakley, Gretton, Little Weldon, and Corby, all of which are reputed to contain about 3500 acres.

The number of deer ſupplied from this bailiwick, for the uſe of the crown, is four brace and a half of bucks, and the ſame number of does; and for the foreſt officers, eleven brace of each: in the whole, fifteen brace and a half of each.

The bailiwick of Brigſtock, which is the leaſt of the three diviſions, comprehends that part of the town and fields of Geddington which lie to the north of the river Iſe; certain woods called Geddington woods, containing about 700 acres; the town and part of the fields of Brigſtock; the woods called Farming woods, containing alſo about 700 acres; and a lodge called Farming-wood Lodge, with an incloſed lawn adjacent to it, ſaid to contain about 200 acres. The number of deer ſupplied from this bailiwick is 34 bucks, and as many does.

The bailiwick of Cliffe is the largeſt diviſion of the foreſt, and comprehends four extenſive tracts of woodland, namely, Weſthay woods, belonging to the earl of Exeter; Moorhay woods, belonging to the earl of Weſtmoreland; Earl's woods in Moorhay walk, the property of the Rev. Abraham Blackhome and others; and Sulchay woods, belonging alſo to the earl of Weſtmoreland. Thoſe woods, with the open plains and waſtes adjoining, and two incloſed lawns, called

Moorhay lawn and Sulchay lawn, held by lord Weſtmoreland, in right of the keeperſhip of thoſe walks, contain together about 4582 acres. The town and fields of Kings-Cliffe, except Cliffe park and parts of the towns and fields of Duddington, Apethorpe, Newton, Naſſington, and Yarwell, are all compriſed within the limits of this bailiwick; but the woods and lawns above mentioned are the parts which are chiefly ſubject to the haunt and feed of deer. For further particulars relating to the foreſts, purlieu-woods, chaſes, &c. of this county, with ſome judicious ſtrictures on their general injurious ſyſtem of management, the reader is referred to Pitt's General View of the Agriculture of Northamptonſhire, 8vo.

*Canals, &c.*—The firſt artificial canal that was made to render any benefit to this county was the Oxford, which paſſes through the pariſhes of Aynho, Boddington, Braunſton, and Barby, all on the weſtern verge of the ſhire. At Braunſton it joins the Grand Junction Canal, which croſſes the weſtern ſide of this county. This navigable cut was planned for the purpoſe of opening a water communication between the river Thames and the principal inland canals of the kingdom. See CANAL.

*Rivers.*—Northamptonſhire may juſtly boaſt, and we believe excluſively, that in the important article of water it is entirely and completely independent: for of the ſix rivers, which flow through or interſect it, every one originates within its boundaries; and not a ſingle brook, however inſignificant, runs into it from any other diſtrict; whilſt there is not a county bordering upon it, that is not in ſome degree ſupplied from its various and ample aquatic ſtores.

The Nen, or Nyne, though, in point of intrinſic celebrity, yielding the palm to the Ouſe and Avon, yet continuing longeſt in, and being moſt beneficial to, the county, has the faireſt claim to priority of notice. It has two ſources: one at Chapel-well, in Naſeby; the other at Hartwell, near Staverton; and both uniting at Northampton, form no inconſiderable river, winding through richly fertile meadows, reaching Peterborough, through Wiſbeach to Lynn, where it is abſorbed in the German ocean.

The Welland, in local importance, ranks the ſecond in this county, and takes its riſe near the vicarage houſe at Sibbertoft, whence having meaſured the ſhort ſpace of four miles, reaches the ſkirts of the county, which adopts its devious wanderings as the line of boundary during a lengthened courſe of nearly fifty miles, by Harborough, Rockingham, and Stamford, where it becomes navigable, through Deeping, to Croyland, when it enters Lincolnſhire, and falls into the Foſsdyke Waſh, near Boſton.

Northampton derives, comparatively, but little benefit from the four other rivers to which it gives riſe, though two of them, the Ouſe and the Avon, ſtand in the firſt claſs of Britiſh rivers; but they are both mere rivulets when they firſt iſſue from the earth, and ſoon deſert their native diſtrict.

The Ouſe (according to Morton) originates at Ouſewell, in the pariſh of Farthingho, near Brackley, and ſpeedily entering Buckinghamſhire, reviſits its parent county near Old Stratford.

The Avon, or Leſſer Avon, commences its courſe at Avon-well, near Naſeby, and flows in a weſterly direction into Warwickſhire.

The Leam, ſpringing from the village of Hellidon, is immediately joined by other rills from Cateſby and Staverton, and paſſes into Warwickſhire.

The Charwell derives its name from a ſmall ſpring called Charwell, near Charwelton.

*Roads, Bridges, &c.*—There are four great mail roads through this county, which are wide, level, and good; a few of the collateral turnpike roads are alſo kept in a good ſtate; but the croſs roads are ſhamefully neglected. They are generally very narrow, and the farmers are either careleſs of performing the ſtatute duty, or wholly neglect them. Each tenant who occupies a farm of 50*l.* is bound to give ſix days' labour with a cart and two men every year; but if the farmer be remiſs in this duty, it appears that thoſe empowered to interfere are equally negligent, and the public traveller is thereby ſubjected to much inconvenience, and even to danger.

*Manufactures.*—Northamptonſhire is not a manufacturing county; but ſtill many of its inhabitants are employed in, and derive a livelihood from, different ſpecies of handicraft buſineſs. The making of ſhoes, lace, woollen ſtuffs, and wool ſtapling, are the chief objects of manufacture, and particularly the firſt.

*Ancient Architecture, Sepulchral Monuments, &c.*—Peterborough cathedral, and its contiguous buildings, diſplay ſome fine examples of the early Norman architecture. The churches of Caxton, Barnack, Earls'-Barton, St. Peter's, and St. Sepulchre's at Northamptom, Barnwell, Twywell, and Stratton, are all diſtinguiſhed by ſemicircular arches, ſhort columns, with correſponding mouldings, &c. In ſome of theſe churches are ancient piſcinas, fonts, ſtone ſtalls, &c. At Fotheringhay is a ſpacious, handſome, collegiate church, with a lofty tower; and at Oundle, Luffwick, Kettering, Higham-Ferrers, Wellingborough, and Finedon, the churches are large and elegant. The croſſes at Geddington, and near Northampton, are intereſting examples of the architecture and ſculpture of Edward I.'s reign. Of ancient manſions, the following are remarkable for their extent, and for their ſtyles of architecture: Burleigh, Kirby, Caſtle-Aſhby, Fawſley, Ruſhton, and Drayton. In Warkton church are three large marble monuments with ſtatues, &c. to the Montague family; and in Weekly church are altar tombs, with effigies to the ſame family. At Brington are ſeveral coſtly tombs in memory of the Spencers of Althorpe. The church of Stowe is remarkable for a very intereſting altar monument with a recumbent figure, probably a portrait, by N. Stone, of Elizabeth Latimer, wife, firſt to ſir John Danvers, and ſecondly to ſir Edmund Carey. The church at Eaſton-Neſton is rendered memorable by ſeveral ſepulchral memorials to the Fermors, earls of Pomfret. In Stamford Baron church are ſome gorgeous monuments to the Cecils of Burleigh. The cathedral church of Peterborough contains ſome ſepulchral mementos, but few of theſe are of diſtinguiſhed importance. The perſecuted Mary queen of Scots is recorded by a cenotaph; Catherine of Arragon, firſt wife to king Henry VIII., was alſo interred here.

In the church at Rockingham, the Watſons, now baron Sondes, have uſually been interred, and ſome monuments have been raiſed to their memories. Lufwick church is not more diſtinguiſhed for its architecture than for the monuments that adorn its interior; for here are ſeveral to the different families of Stafford, Vere, Mordaunt, Green, &c. It contains alſo ſome fine ſpecimens of ſtained glaſs. In Caſtle-Aſhby church are ſome old braſſes, and an ancient tomb with an effigy of a knight armed.

The church of Eaſton Maudit contains three or four monuments with ſtatues, canopies, &c. to the Yelvertons. In Horton church is a curious tomb to William lord Parr, uncle to Catherine; alſo braſſes to Roger Saluſbury and his two wives. Hardingſtone church has two old tombs and a fine monument by Ryſbrack. At Fawſley are ſeveral mural ſlabs, braſſes, and finely ſculptured monuments to different perſons of the Knighty family. In Stean church a branch of the Crewe family of Cheſhire was formerly interred, and

ſeveral tombs are preſerved to record the names of different perſons. Marham church contains ſome monumental memorials to the Fitzwilliams of Milton. Hiſtory, &c. of Northamptonſhire, two vols. folio. The Natural Hiſtory of Northamptonſhire, by John Morton, M. A., folio. General View of the Agriculture, &c. of Northamptonſhire, by Pitt: Ditto by Donaldſon. Beauties of England, vol. xi, by J. Britton and the Rev. J. Evans.

NORTHBOROUGH, a townſhip of America, in Worceſter county, Maſſachuſetts, incorporated in 1760, and containing 698 inhabitants; 10 miles E. of Worceſter.

NORTHBRIDGE, a townſhip in Worceſter county, Maſſachuſetts, bounded S. by Uxbridge, incorporated in 1772, and containing 544 inhabitants; 12 miles S. by E. of Worceſter.

NORTH CAROLINA. See CAROLINA.

NORTH-CASTLE, a townſhip of America, in Weſt Cheſter county, New York, N. of Mount Pleaſant, and the White Plains on the borders of Connecticut; containing 1168 inhabitants.

NORTH-EAST TOWN, a town of America, in Dutcheſs county, New York, about 90 miles N. of New York city; containing 3252 inhabitants.

NORTH END, a town of Matthews' county, Virginia; 185 miles from Waſhington.

NORTHERN ARCHIPELAGO. See ANDREANOFSKEA and ALEUTIAN.

NORTHERN *Aſpect*, or *Expoſure*. See EXPOSURE.

NORTHERN *Hemiſphere*. See HEMISPHERE.

NORTHERN *Indians*, in *Geography*, a name given to the wandering tribes that inhabit the region of North America, which lies between N. lat. 59° and 68°, being 500 miles wide, bounded E. by Hudſon's bay, W. by the country of Athapuſcow Indians, S. by Churchill river, and N. by the Dogribbed and Copper Indians. In their perſons they are generally above the common ſize, ſtrong, but not corpulent. They are neither active nor lively in their diſpoſitions; they have very low foreheads, ſmall eyes, high cheek-bones, Roman noſes, full cheeks, and generally long, broad chins. On each cheek they have three or four parallel ſtrokes marked black. In their diſpoſition, theſe are moroſe, covetous, and ungrateful; and much addicted to deceit and impoſition, and when treated with reſpect, inſolent. Among their good qualities, we may enumerate their mildneſs, temperance in drinking, and averſion from riot and violence. In their marriages, they have no ceremony; the women have no choice, being betrothed by their parents in childhood. Polygamy is allowed, and wives are made to ſubmit to the hardeſt labour. The men are jealous, and divorces are very common. Many of theſe people boil their food in veſſels of birch bark, by caſting in hot ſtones; and for want of wood they often eat their meat and fiſh raw. Among their dainties, they reckon maggots, lice, and blood. Fiſh and game are plentiful, and ſupply the chief part of their food; and when theſe fail, a black hard moſs collected from the rocks is a ſubſtitute; this is boiled, and affords conſiderable nouriſhment. Their principal diſeaſes are the ſcurvy, conſumption, and flux. They are very much under the influence of ſuperſtition. When any of their principal Indians die, they believe that they are conjured to death. The dead are left on the ground till they are devoured by fowls and beaſts. The aged are always treated with neglect, and fed with the meaneſt food. A cuſtom prevails among them of exchanging a night's lodging with each other's wives. This is conſidered as a pledge of friendſhip between two families; and when either of the men dies, the other conſiders himſelf bound to ſupport the family deprived of a huſband and father. Two or three ſiſters are often wives to the ſame huſband. Of religion, in principle and practice, they ſeem to be lamentably deſtitute; though their conjurers pretend to converſe with ſpirits. The preſent evil alone diſturbs their minds, and they ſeem to have no idea of futurity. Hearne. Morſe. See INDIANS.

NORTHERN *Light*, or *Aurora Borealis*. See AURORA *Borealis*.

NORTHERN *Ocean*. See OCEAN.

NORTHERN *Signs*, are thoſe ſix on the north ſide of the equator. See SIGN.

NORTHFIELD, in *Geography*, a townſhip of America, in Orange county, Vermont, between 20 and 30 miles W. of Newbury, containing 204 inhabitants.—Alſo, a pleaſant poſt-town in the N. part of Hampſhire county, Maſſachuſetts, on the E. ſide of Connecticut river; 30 miles N. of Northampton, containing 1047 inhabitants; incorporated in 1673, repeatedly deſtroyed by the Indians; and rebuilt in 1713. —Alſo, a ſmall town in Rockingham county, New Hampſhire, on the E. ſide of Merrimack river; incorporated in 1780, and containing 925 inhabitants.—Alſo, a townſhip in Richmond county, Staten iſland, New York, containing 1387 inhabitants.

NORTHFLEET, a village and pariſh in the lower half hundred of Toltintrough, lathe of Aylesford, and county of Kent, England, is ſituated near the banks of the Thames, two miles diſtant from Graveſend, and 20 miles N.E. of London. It was anciently the property of the ſee of Canterbury, but was alienated by archbiſhop Cranmer, in exchange for other lands, with Henry VIII.; it has ſince had ſeveral intermediate poſſeſſors, but was finally granted by the crown to the late earl of Beſborough, about the year 1758, at the annual rent of ſix ſhillings and eight-pence. Of this nobleman it was purchaſed by the late John Calcraft, eſq. The north-weſt part of this pariſh is a low marſh, which was formerly covered by the Thames, and is now croſſed by a high cauſeway and bridge, with floodgates to prevent the tides flowing beyond it. The village is irregularly built round Northfleet Green, and on the ſides of the high road. The pariſh church, which is one of the largeſt in the dioceſe, conſiſts of a nave, aiſles, and chancel, with a low tower, erected at the beginning of the laſt century, within the ſcite of the foundation walls of the ancient ſtructure, but by no means correſpondent with the reſt of the building. The nave is ſeparated from the aiſles by octagonal, maſſive columns, ſpreading off into pointed arches, without the intervention of capitals. The church contains ſeveral monuments of the fourteenth century; and on the north wall is one of alabaſter, to the memory of Dr. Brown, eminent for his knowledge in natural hiſtory, and phyſician to king Charles II. In the return made to parliament, purſuant to the population act of the year 1811, Northfleet was ſtated to contain 372 houſes, occupied by 2031 perſons; of theſe a great number derive employment from the contiguous chalk works, which extend from the northern ſide of the village to the Thames; their width on an average being nearly a quarter of a mile. The chalk pits are immenſe; the cliffs where the chalk has been dug preſenting, in many places, a precipitous ſurface from 100 to 150 feet in perpendicular height. The chalk forms a conſiderable branch of commerce, and along the ſhore are ſeveral wharfs for the convenience of ſhipping it off, both in its natural ſtate, and when burnt into lime, for which purpoſe here are ſeveral large kilns. The flints alſo, which pervade the chalk in thin ſtrata, are collected for ſale; theſe form a material ingredient in the compoſition of the Staffordſhire ware; and great quantities are exported to China.

On

On an elevated ſituation in the vicinity of Northfleet is Ingreſs, formerly called Ince-grice, the ſeat of Henry Roebuck, eſq. It was the property of John Calcraft, eſq. who died in 1772; this gentleman arranged in an elegant ſummer houſe, built in a hollow of the chalk cliffs, a valuable collection of Roman altars, brought from Italy; with ſtatues and other ſpecimens of Roman ſculpture, placed in various parts of the garden. Haſted's Hiſtory and Topographical Survey of Kent, 12 vols. 8vo. Beauties of England and Wales, vol. vii. by E. W. Brayley.

NORTHFORD, a pariſh of Branford, New Haven county, Connecticut, in which are a poſt-office, and alſo a Congregational and an Epiſcopal church; 10 miles E. of New Haven.

NORTH HAMPTON, a townſhip of New Hampſhire, in Rockingham county, containing 653 inhabitants; incorporated in 1742.—Alſo, a townſhip in Montgomery county, New York; containing 996 inhabitants.

NORTH HAMPSTEAD, a townſhip in Queen's county, Long iſland, New York; containing 2413 inhabitants, of whom 269 are ſlaves.

NORTH HAVEN, a townſhip of Connecticut, ſituated in New Haven county, on the E. ſide of Eaſt river; 32 miles S. by W. of Hartford, ſettled in 1660, and containing 1157 inhabitants.

NORTH HUNTINGTON, a townſhip in Weſtmoreland county, Pennſylvania, including 1484 inhabitants.

NORTHING, in *Navigation*, the difference of latitude, which a ſhip makes in ſailing towards the *north pole*.

NORTH KINGSTOWN, in *Geography*, a town of America, in Waſhington county, Rhode iſland, which carries on a conſiderable trade in the fiſheries, and alſo ſome to the Weſt Indies; its harbour is called Wickford; eight miles N.W. of Newport. The townſhip contains 2794 inhabitants, including 39 ſlaves.

NORTHLEACH, a ſmall market town in the hundred of Bradley, Glouceſterſhire, England, is ſituated in a bottom amongſt the Cotſwold hills, near the ſource of the little river Leach, at the diſtance of 20 miles from the city of Glouceſter, and 82 miles from London. The manor was given by king Ethelred to the abbey at Glouceſter, to the monks of which Henry III. granted the privilege of two annual fairs, and a weekly market. After the diſſolution the manor paſſed into lay hands; it came into the Dutton family at the beginning of the laſt century; and is now the property of James Dutton, who was created lord Sherborne in 1784.

About the beginning of the ſixteenth century Northleach was of conſiderable importance as a clothing town; but not having a ſufficiency of water to ſupply the increaſed demand of the manufacture, it gradually declined. Here was formerly a public market for wool and cloth; ſome of the buildings for the reception of theſe articles are mentioned by Rudder, in his Hiſtory of Glouceſterſhire, as remaining, having a ſpacious area in the centre, and communicating, when he wrote, with each other by galleries. The town conſiſts chiefly of one long, irregular ſtreet: the market houſe is an ancient ſtructure, ſupported by columns; near it are ſeveral ſteps, and the baſe of an ancient croſs. The church, which is a ſpacious edifice, conſiſts of a nave, chancel, and ſide aiſles, an elegant ſouth porch, and a lofty tower at the weſt end, with open-worked battlements. The ſouth porch is embelliſhed with tracery, externally and internally. The whole ſummit of the building is embattled, and ornamented with pinnacles. The church contains many ſepulchral memorials of opulent clothiers who lived in the fifteenth century. A free grammar ſchool was founded here, in 1559, by Hugh Weſtwood, eſq., who endowed it with the impropriation of Chedworth, then producing nearly 120*l. per annum:* every fourth year an exhibitor is ſent from this ſchool to Pembroke college, Oxford, on the foundation of George Townſend, eſq. The civil government of the town is veſted in a bailiff and two conſtables. In the population return in the year 1811, the inhabitants of the pariſh are ſtated to be 647 occupying 142 houſes. The market is held on Wedneſday; and here are now three annual fairs.

At Eaſtington, a tything in Northleach pariſh, Dr. Woodward made a great part of his valuable collection of foſſils, which he preſented to the univerſity of Cambridge. This tything is alſo remarkable for being the ſcite of an ancient encampment, called Norbury, which Baxter ſuppoſes to be a corruption of Morbyrig, or the Great Camp. It was of an oblong form, incloſed with a double agger, and contained about eighty acres; but the ground having been long cultivated, the banks are in many parts levelled. From the proximity of this to the Foſs-way, it has been conſidered as Roman.

About five miles from Northleach is the village of Sherbourn, or Sherborne. The manor belonged to the abbey of Winchcomb from before the Conqueſt till the Diſſolution. It afterwards became the property of the Duttons; and is now poſſeſſed by lord Sherborne, who has a ſeat here called Sherborne Houſe. It is an extenſive manſion, and conſiſts of two quadrangles; the eaſtern and moſt ancient part of which is ſuppoſed to have been the reſidence of the abbots of Winchcomb. Two parks belong to this houſe, each between three and four miles in circumference; in one of them is a neat lodge.

Sherbourn was the birth-place of Dr. James Bradley, who ſucceeded Dr. Halley as aſtronomer royal at Greenwich. He was born in 1692, died in 1762, and was buried at Minchin-Hampton in Glouceſterſhire. Rudge's Hiſtory &c. of Glouceſterſhire, 2 vols. 8vo. Beauties of England, vol. v.

NORTHLINED LAKE, a lake of America, about 160 miles S. of the head of Cheſterfield inlet, about 80 miles long, and 25 broad, full of iſlands. N. lat. 60° 40′. W. long. 98° 30′.

NORTHORN, a town of Germany, in the county of Bentheim, on the Vechte; eight miles N. of Bentheim.

NORTHPORT, a townſhip of America, in Hancock county, Maine, incorporated in 1796, and containing 482 inhabitants.

NORTH SALEM, a townſhip of America, in Weſt Cheſter county, New York, oppoſite to Ridgefield in Connecticut, containing 1145 inhabitants.

NORTHUMBERLAND, the moſt northerly county of England, lies between 54° 51′ and 55° 48′ N. lat., and between 1° and 2° 27′ W. long. It is bounded on the eaſt by the German ocean; on the weſt by Roxburghſhire and Cumberland; on the north by Berwickſhire; and on the ſouth by the county of Durham. Including the detached portions of the latter county, called Northamſhire, Iſlandſhire, and Bedlingtonſhire, it extends 64 miles in length, and in ſome places 48 in breadth; and compriſes an area of 1980 ſquare miles, or 1,267,200 acres; of which 817,200 are level and ſuſceptible of cultivation, while the remaining 450,000 are of a mountainous character, and not adapted to agricultural purpoſes.

*Hiſtorical Events.*—This county, previous to the Roman invaſion, is conjectured by Camden to have formed a part of that diviſion of Britain which was occupied by the Ottadini or Ottatini, a tribe of the Meätæ, who are mentioned by Dio Caſſius as poſſeſſing the territories adjoining the Picts wall.

wall. Theſe people were ſituated more to the ſouth and eaſt than the Gadeni, and had for their chief city Bremenium, the ruins of which are ſtill ſeen near Rocheſter in Reedſdale. After the armies of Rome had extended their conqueſts to the Forth, Northumberland was included in the province of Valentia. Under the Saxon government it conſtituted part of the extenſive and powerful kingdom of Northumbria, which is generally ſuppoſed to have reached from the north bank of the Humber to the Frith of Forth. This monarchy was begun by Ida, who arrived in Britain in the year 547, and having conquered a conſiderable extent of territory, aſſumed the purple under the title of king of Bernicia; and was ſucceeded by his ſon Adda. In the firſt year of this prince's reign, Ælla, a noble chieftain of Saxony, who had accompanied Ida in his expedition, made war upon the Britons in the province of Deïra, drove them from their territories, and ſettling his followers therein, aſſumed the regal authority. Adda, king of Bernicia, dying in the ſeventh year of his ſovereignty, was ſucceeded by four princes, Glappa, Theolwald, Frethulf, and Theodric, of whom nothing is known but their names, and the number of years they reſpectively ſwayed the ſceptre. On the death of the laſt of theſe monarchs Ælla acquired the ſovereignty of both kingdoms, which he united under the name of the kingdom of Northumberland. This prince enjoyed his conjunct rule only three years, when he died, leaving iſſue a ſon and a daughter, Edwin and Acca, but as the former was yet too young to take upon himſelf the government, Ethelric, the ſecond ſon of Ida, was raiſed to the throne. His reign laſted during five years of profound peace, at the end of which time he departed this life, and left the kingdom to his ſon Ethelfrith, who, the better to inſure the ſtability of his ſway over Deïra, which of right ſhould have deſcended to Edwin, eſpouſed Acca, the ſiſter of that prince. Ethelfrith, ambitious of military renown, was conſtantly engaged in war for the firſt twenty years of his reign, either with the Britons or the Scots, whom he defeated in ſeveral deſperate engagements, and ſpread the terror of his arms even among the Saxon ſtates. This train of ſucceſs, having ultimately led to peace with all the neighbouring kingdoms, Ethelfrith had leiſure to examine more cloſely his affairs at home. He looked with a jealous eye on young Edwin, whoſe title to the throne of Deïra was unqueſtionably preferable to his own, and fearing that he might one day be induced to aſſert his rights, reſolved to remove this obſtacle to his happineſs, by murdering the prince. He, however, being by ſome means made acquainted with the intended treachery againſt him, fled from Northumberland, in company with his wife, and ſought refuge at the court of Redwald, king of the Eaſt Angles. This prince, by the perſuaſion of his queen, determined rather to hazard the fortune of war, than deliver up Edwin to the meſſengers of the Northumbrian monarch, who demanded him with all the arrogance of a conqueror towards his vaſſals. Accordingly collecting his forces, he followed the ambaſſadors with ſuch expedition as aſtoniſhed Ethelfrith, who, nevertheleſs, advanced againſt him with perfect confidence of ſucceſs. Both armies met upon the banks of the river Idle, where a ſanguinary engagement enſued, in which Regenhere, the ſon of Redwald, was ſlain. Victory, however, declared for the Eaſt Anglian; and as Ethelfrith himſelf alſo fell in the action, and his ſons were yet infants, Edwin found little difficulty in obtaining poſſeſſion of the Northumbrian crown.

Of all the princes of the heptarchy at this period, Edwin was undoubtedly the greateſt, being no leſs diſtinguiſhed for his influence abroad, than for his rigid and impartial adminiſtration of juſtice within his own dominions. He reclaimed his ſubjects from the licentious life to which they had hitherto been accuſtomed, and eſtabliſhed ſo excellent a ſyſtem of police in every part of his kingdom, that it became proverbial to ſay, a perſon might do any act with as much ſafety as a woman or child could paſs through Northumberland with a purſe of gold in their hand; meaning thereby, that there was not the ſmalleſt danger to be apprehended from its execution. Every individual placed near his throne loved him; and he was one of thoſe few monarchs who could boaſt of the ſincere attachment of his miniſters and favourites. Of this happy fortune, there is a remarkable inſtance upon record. Guichelme, king of Weſſex, envying his glory, but fearing to wage open war againſt ſo gallant and powerful a prince, determined to cut him off by treachery. With this view, he ſent as ambaſſador to his court, one Eumer, a villain adequate to the moſt bloody and atrocious deed, who having obtained admittance to the king, under the pretence of delivering a meſſage from the Weſt Saxon prince, drew his dagger, and would have murdered Edwin on the ſpot, but for the noble conduct of Lilla, an officer in his army. This heroic ſoldier perceiving the danger of his prince, and having no other means of defence, ſuddenly interpoſed his own body between him and Eumer's dagger, and was pierced to the heart. Exaſperated at this barbarous deſign, which, though it failed of its avowed purpoſe, had deprived him of ſo valuable a friend as the murdered Lilla, he marched an army into Weſſex, and being every where ſucceſsful, either ſlew or made priſoners all who had any ſhare in his intended aſſaſſination, and rendered the kingdom tributary to the crown of Northumberland.

About this time the Eaſt Angles having conſpired againſt their king, Redwald, put him to death, and offered the ſceptre to Edwin. But this prince, notwithſtanding his vaſt ambition, poſſeſſed a mind ſuperior to the baſe feeling of ingratitude. Inſtead, therefore, of graſping at the opportunity thus afforded him, of adding another powerful kingdom to his already extenſive territories, he remonſtrated with the deputies on the barbarity of their regicide, and declared his determination to ſupport Earpwold, the ſon of Redwald, on the throne of his father. Hitherto the Northumbrian Saxons continued to worſhip idols, and though ſome attempts had been made to convert them to Chriſtianity, all had failed to effect that deſirable object. The period, however, was now arrived in which they were deſtined to receive the bleſſed doctrines of the goſpel. Edwin's firſt wife having died while he reſided at the court of Redwald, he married, for his ſecond, Ethelburga, the daughter of Ethelbert, king of Kent, who was already converted, and had eſtabliſhed the religion of Jeſus throughout every portion of his dominions. That lady, emulating the glory of her mother, Bertha, by whoſe zeal that happy reſult had been accompliſhed, carried Paulinus, a learned biſhop, along with her, and beſides ſtipulating a toleration for the exerciſe of her own worſhip, which was readily granted, uſed every effort in her power to induce her huſband to adopt it alſo. Edwin, like a prudent prince, promiſed to examine the principles upon which her faith was founded, and declared that if they appeared more agreeable to the dictates of reaſon than the foundations of his own, he would willingly comply with her requeſt. Accordingly he held ſeveral conferences with Paulinus, canvaſſed the arguments with the wiſeſt of his counſellors, and after a ſerious and long inquiry, decided in favour of Chriſtianity. But though allowed to exerciſe their judgments on the great queſtion of their ſalvation, the people did not reject the truths offered to their conſideration. The Northumbrians, almoſt to a man, threw off the ſhackles of idolatry, and embraced the new religion. Unhappily, however, the

ſucceſſion

ſucceſſion of events which followed this important era proved hoſtile to the immediate conſummation of the glorious deſtiny ſo auſpiciouſly begun. Penda, the Pagan king of Mercia, ſtimulating Ceadwallo, king of the Britons, to take up arms, and throw off the Northumbrian yoke; the two monarchs joined their forces, and waited the advance of Edwin, who had already taken the field with a powerful force to quell the inſurrection. A place called Hatfield Chace, in Yorkſhire, was the ſcene of conteſt. Both armies performed prodigies of valour, but Edwin and his ſon being killed in the action, the Northumbrians, loſing confidence, immediately gave way, and in the end were defeated with immenſe ſlaughter.

Penda and Ceadwallo now penetrated into the kingdom of Northumberland, and ſpread death and deſolation every where around them. Penda in particular, if belief can be given to the monkiſh hiſtorians, directed his ſavage vengeance with ten-fold cruelty againſt the Chriſtian inhabitants; till at length fated with blood, both he and the Britiſh monarch retired to their own dominions. Eanfred, the ſon of Ethelfrith, now returned with his brothers Oſwald and Oſwy from Scotland, and took poſſeſſion of Bernicia, his paternal kingdom; and Oſric, the couſin-german of Edwin, eſtabliſhed himſelf in Deïra, the inheritance of his family. Hence the monarchy of Northumberland was again divided into two diſtinct ſovereignties; and as the kings of each renounced the doctrines of Chriſtianity, which they had embraced during their exile, Paganiſm once more became the court worſhip in both kingdoms. This apoſtacy, however, did not ſhield them from the rage of Ceadwallo; but moſt probably gave a keener edge to his ſword, as he himſelf was profeſſedly a Chriſtian. Again entering Northumbria, he ravaged the country with ſtill more ferocious barbarity than before. Oſric fell in the defence of his own city; and Eanfrid, terrified at his fate, went in perſon to the camp of the Welſh king to ſue for peace, and implore his clemency; but notwithſtanding the ſacred purpoſe of his viſit, he was arreſted and put to death by the murderous tyrant.

Upon this event Oſwald, the only ſurviving legitimate brother of the murdered prince, reſolving to revenge the wrongs of his family, and taking advantage of the hatred with which the treachery of Ceadwallo had inſpired his countrymen, raiſed a conſiderable army, and marched to offer battle to the execrable oppreſſor. A moſt ſanguinary action enſued, in which, notwithſtanding his inferiority in numbers to his enemy, Oſwald was completely ſucceſsful, Ceadwallo and the chief of his nobility being ſlain on the field, and the reſt of his army routed and diſperſed. This glorious engagement was fought at Dennis, on the borders of the county; and eventually enabled Oſwald to aſſume the crown of Northumberland, by a re-union of the kingdoms of Bernicia and Deïra. Oſwald likewiſe reſtored the Chriſtian religion, and ſucceeded, by his judicious conduct, in wholly extirpating Paganiſm from his dominions. He is much celebrated by the monkiſh writers for his ſanctity and charity, which procured him the honours of canonization. Oſwald died in battle againſt Penda, king of Mercia, and was ſucceeded by his natural brother Oſwy, who eſtabliſhed himſelf on the Northumbrian throne, by putting to death Oſwin, the ſon of Oſric, the laſt king of the race of Deïri. His ſon Egfrid ſucceeded him, who was ſlain in an engagement with the Picts, without leaving any children; becauſe Adelthrid, his queen, refuſed to violate her vow of chaſtity. Alfred, his natural brother, conſequently acquired poſſeſſion of the kingdom, which he governed for nineteen years, and left it to Oſred, his ſon, a boy only eight years of age. This prince reigned eleven years, and was murdered by his kinſman Kenred, who enjoyed his uſurped dignity little more than a year, having ſuffered the puniſhment of his barbarity by a ſimilar fate. Oſric, and after him Celwulph, the ſon of Kenred, next mounted the throne; which the latter relinquiſhed in favour of Eadbert, his couſin-german. He, imitating his predeceſſor, abdicated the crown alſo, and retired into a monaſtery. Oſwolf, ſon to Eadbert, periſhed in an inſurrection ſoon after his acceſſion, when the ſovereignty was ſeized by a nobleman named Mollo, who reigned ten years, and was ſlain by the treachery of Alured. This prince, a deſcendant from Ida, firſt king of Northumberland, now obtained the ſceptre, but, conducting himſelf tyrannically, was expelled by his ſubjects: Ethelred, his ſucceſſor, was likewiſe compelled to renounce his authority; and Celwald, the next king, was depoſed and ſlain by the people, and his place filled by Oſred, who, after reigning one year, made way again for Ethelred, whoſe death was equally tragical as that of almoſt all his predeceſſors. An univerſal anarchy now prevailed in Northumberland for ſeveral years, till at length Egbert, king of Weſſex, ſubdued the kingdom, and rendered it tributary to his crown. From this time Northumberland remained in ſubjection to the Weſt Saxon yoke, till it was conquered, after a bloody ſtruggle, by the Danes, who nearly extirpated or expelled the whole of the Saxon proprietors, and ſettled themſelves in the deſerted territories.

Thus ended the powerful monarchy of Northumberland, after it had ſubſiſted three hundred and thirty years. As the poſſeſſors of the land were now entirely Danes, Daniſh laws prevailed throughout its entire extent, and continued in force till the time of Edward the Confeſſor, when they were incorporated with the Weſt Saxon and Mercian codes, and the whole made common to England under the name of the laws of Edward. The governors ſubſequent to this period were hereditary earls, who ſometimes aſſumed the title and inſignia of royalty. Edgar, however, deeming the hereditary rule of ſo extenſive a country an elevation too high for a ſubject, divided it into two diſtinct portions; and not long after granted all the diſtrict, from the Tweed to Edinburgh, to Kenneth, king of Scotland, to be for ever annexed to his dominions. Other grants cut off additional diſtricts about the ſame era, ſo that previous to the Norman conqueſt Northumberland was reduced to its preſent limits. Theſe events led to important changes. This county, now rendered a frontier diſtrict with Scotland, became the principal theatre of the border wars, which raged from the time of Stephen to the union of the two crowns in the perſon of king James. The people of Tindale and Reedſdale, in common with the borderers of Cumberland and Scotland, were, in thoſe days, nothing leſs than clans of lawleſs banditti, who were conſtantly engaged in depredatory excurſions. The tract which they occupied extended about 50 miles in length, and ſix in breadth, and was called "the Debateable Land," both nations laying claim to it, though in fact it belonged to neither, as their utmoſt efforts were ineffectual for the ſubjection of its inhabitants, whoſe dexterity in the art of thieving was ſuch, that they could twiſt a cow's horn, or mark a horſe, ſo that its owner could not know either again. The Engliſh borders were divided into three marches. The weſtern march extended from the Solway Frith to Tindale; the middle march compriſed Tindale and Reedſdale; and the eaſtern march reached from Reedſdale to Tweedmouth. The marches were under the juriſdiction of a lord-warden general, an office of a military nature, and uſually held by one of the dukes or earls of Northumberland. The executive part of the duties, however, was uſually confided to a deputy, under whom were three inferior wardens. One of theſe officers ſat, by the king's commiſſion, as judge in the

march courts, and aſſiſted in framing border laws and ſettling treaties with Scotland. Their common buſineſs was to regulate the watches, diſcipline the militia, and take meaſures for aſſembling them in arms at the firſt alarm of an enemy in the time of war; but during peace they were chiefly employed in ſuppreſſing the inſolence and rapine of the borderers.

Beſides the mere border conteſts, ſeveral important battles have been fought within the boundaries of this county. The battle of Otterburne, where the brave earl Douglas loſt his life in 1388, was decided in the neighbourhood of Otterburne-caſtle. This action terminated in favour of the Scots, notwithſtanding the fall of their leader; ſir Henry Percy, the commander of the Engliſh, being wounded and taken priſoner. John Nevil, marquis of Montague, general of Edward IV., gained a deciſive victory at Hexham over the forces of the depoſed king, Henry VI., and was, on that account, raiſed to the dignity of duke of Northumberland. Near Branxton was fought the celebrated battle of Flodden, in which James IV. of Scotland was ſlain with the flower of his nobility; and at Newburn the army of king Charles I. ſuſtained a complete overthrow from the Scots under the command of general Leſley, who ſoon after beſieged and took the town of Newcaſtle, though bravely defended by ſir John Morley, the mayor.

In former times the lands of Northumberland were held of the king by knights' ſervice. The barons and people of higher condition dwelt in caſtellated manſions, or moated towers. The middling claſſes of the people held their lands of the barons chiefly in ſocage tenure, and reſided in buildings called peels or piles, conſiſting of a ground floor, in which their cattle were kept during the night, with a floor above, occupied by the family. The lower orders, in common with the middle claſs, were ſubject to the grievous ſervice of keeping night-watches at all the fords, paſſes, and inlets of the vallies, to guard againſt the incurſions of the borderers, or of the Scots, during hoſtilities. When either a troop of banditti, or an enemy, made their appearance, every man within hearing of the horn was bound, under pain of death, to riſe and aſſiſt in the protection of the country. In this ſtate of things, as may be ſuppoſed, the occupations of peaceful life were little attended to. Agriculture was ſuffered to languiſh, and every art, but the art of war, was eſteemed mean and diſhonourable. Fortunately the events of the two laſt centuries have materially altered this dreadful aſpect of human life. Since the union of Scotland and England thoſe ſcenes of contention and barbariſm, which rendered exiſtence and property equally precarious, have been gradually diſappearing. The country has been incloſed far up the vallies of Tindale and Reedſdale, and the refinements of civilization, and the ſocial and enchanting harmony of rural life now prevail, where, before that happy event, ſcarcely a ſound was heard, but the "warder's tread," or the agonized ſcreams of the widow and the fatherleſs, whoſe kind protector lay weltering in his blood, while the flames devoured their little cottage, and left them no ſhelter from the rude blaſt of the pitileſs winter.

*General Aſpect, Soil, and Climate.*—The aſpect of Northumberland diſplays as much variation as that of any other county in England. Along the ſea-coaſt the land is, for the moſt part, a perfect level. Towards the middle the ſurface is more diverſified, and thrown into large ſwelling ridges. Theſe parts are well incloſed, and, in ſome ſpots, enriched with woods and plantations. The weſtern and northern diſtricts of the county, with the exception of a few intervening vales, may be characteriſed as an extenſive ſcene of open, mountainous country, where the hand of cultivation can rarely be diſcovered. Of theſe diſtricts, that towards the north is the moſt valuable, exhibiting in general a ſeries of fine green hills, thrown into numberleſs combinations of forms, and incloſing and ſheltering many deep, narrow, and ſequeſtered glens. The more ſouthern diviſion, on the other hand, is not marked by any ſtriking irregularities of ſurface, but, like the Highwolds of Yorkſhire, preſent a range of widely extended ſolitary waſtes, producing little elſe but heath, and ſcarcely affording ſubſiſtence to the few flocks of ſheep by which they are depaſtured. With reſpect to ſoil, it may be obſerved, that a ſtrong, fertile, clayey loam covers the level tract along the ſhore. This ſoil is admirably adapted for the culture of any ſpecies of grain. A ſandy, gravelly, and dry loam, is chiefly apparent in thoſe vallies which are watered by rivers; but particularly in the vales of Breamiſh, Till, and Beaumont, and on the outſkirts of the Cheviot mountains. In the middle and ſouth-eaſt parts of the county, a wet, cold, clayey bottom is found to exiſt throughout a great extent of country; and in moſt of the mountainous diſtricts black peat earth is more abundant than any other kind of ſoil. The climate is as changeable as the nature of the country is various. Upon the mountains ſnow ſometimes lies for ſeveral months in conſiderable depth, though there is none in the vallies, or lower diſtricts. The weather is extremely inconſtant, but moſtly runs in extremes. In the ſpring dry eaſterly winds are very prevalent, and continue late; ſo that ſummer ſeldom commences till near the cloſe of June, when milder breezes from the ſouth pour in their life-inſpiring balm, and quicken the drooping plants into vigorous vegetation. Hence the autumn of the year is properly the ſummer of Northumberland. The months of September and October are uſually fine ſettled weather, but no ſooner has November begun, than winter ſets in with the utmoſt keenneſs and ſeverity.

*Agriculture.*—In a country exhibiting ſuch diverſity of ſurface and climate, as has been mentioned above, a correſponding difference of produce and management may be expected to prevail. Wheat is ſeldom raiſed, except on the lands near the ſhore. Drilling has been introduced, and is practiſed to a conſiderable extent. The manures in uſe are chiefly the produce of the ſheep-fold in the higher diſtricts, and lime, marle, and ſea-weed in the lower. A large quantity of manure is likewiſe brought from London, as ballaſt, in the coal veſſels. Great attention is paid to rearing ſtock. The favourite and almoſt excluſive breed of cattle is the ſhort-horned, or Dutch kind; and this preference is given in conſequence of the ſuperior rapidity of their growth. The Devonſhire kind is only in the poſſeſſion of one proprietor; and in Chillingham park, belonging to the earl of Tankerville, is a ſtock of wild cattle, probably the only remains of the true and genuine breed of that ſpecies in Great Britain. Their colour is invariably white, muzzle black, with ſmall tips of red behind the ears. The horns partake of the ſame colour as the body, and are tipt with black. Some of the bulls have a thin, upright mane, about an inch and a half, or two inches, long. On the firſt appearance of a ſtranger, theſe animals gallop off at full ſpeed to a conſiderable diſtance, then wheeling round, they come up boldly again, toſſing their heads in a menacing manner. On a ſudden they make a full ſtop, and again fly off. This they repeat ſeveral times, approaching nearer and nearer every return, till they come within a few yards, when it is uſually thought prudent to leave them. When the cows calve, they hide their offſpring in ſome ſequeſtered ſpot, and go and ſuckle them two or three times a day. If any perſon approaches a calf ſo ſituated, it claps down its head cloſe to the ground, and lies, like a hare, in a form to conceal itſelf, and ſhould he be ſeen to touch it, by the mother, he may rely

upon being inſtantly attacked by the whole herd. Such of them as may happen to be wounded, or grown weak and feeble through age or ſickneſs, are ſet upon by the reſt, and gored to death. (See Bewick's Hiſtory of Quadrupeds.) The ſheep of Northumberland are of three ſorts, the Cheviot-ſheep, the heath-ſheep, and the long-woolled ſheep. Of theſe the Cheviot breed is the moſt remarkable for its beauty; the ſecond ſort are peculiarly adapted to the bleak and heathy diſtricts; the third kind have the advantage of fatting at an early age, and producing great quantities of good wool.

The tythes of this county offer no peculiar feature, except that the tythes of hay and corn, being for the moſt part in the hands of opulent laymen, renders commutation for money leſs practiſed than it otherwiſe might be. The annual value of eſtates riſes from the ſmalleſt ſum to upwards of 30,000*l.* One eſtate only is ſaid to yield more than 80,000*l.* a-year. In the mountains, eſpecially near the ſources of the Tyne, there are ſeveral ſmall eſtates from thirty pounds to three hundred a-year, farmed by their proprietors, and as theſe have generally been handed down through ſeveral generations, a ſtrong attachment to ancient methods of huſbandry have deſcended with them, and improvements have been ſlowly adopted. The largeſt farms are thoſe in Glendale and Bamborough wards; and ſome tenants in the northern parts of the county rent from 2000*l.* to 4000*l.* *per annum*. Dry loams let for fifty, or fifty-five ſhillings *per* acre, and the old rich grazing paſtures for ſixty or ſeventy ſhillings, tythe free. All the rents are paid in money, and four or five months credit is uſually given to the farmers; many of whom are deſervedly held in high eſtimation for their agricultural ſkill, and by their liberal and ſcientific views have contributed to exalt their profeſſion to a high point in the ſcale of practical ſcience.

The rivers of Northumberland are numerous, and ſpread, by a great variety of branches, throughout almoſt every part of the county. The principal of them are the Tyne, the Tweed, the Blythe, the Wanſbeck, the Cocquet, the Aln, and the Till. The Tyne riſes from two ſources, one behind Croſs Fell, and another on the borders of Scotland, which, till the junction of their ſtreams, are denominated the North and South Tyne. This river was formerly celebrated for its ſalmon fiſheries; but theſe are now entirely deſtroyed. It is ſtill, however, of high importance in a commercial view, being navigable for veſſels of large burden far above Newcaſtle, which is one of the firſt trading towns on the eaſtern coaſt of our iſland. The conſervatorſhip of the Tyne is veſted in the mayor and corporation of Newcaſtle, whoſe juriſdiction extends to high water mark, on both ſides of the river from the ſea to Hedwin ſtreams, above Newburn, which diſtance is ſurveyed annually on Aſcenſion day. The Tweed divides England from Scotland, and conſequently forms the northern boundary of the county. It riſes at a place called Tweed's Croſs in Tweedale, and receives, in its progreſs through North Britain, three rivers, much celebrated in ſong, the Ettrick, the Leader, and the Tiviot. The annual rental of the ſalmon fiſheries on this river amounts to the enormous ſum of 15,766*l.*; and the yearly value of the ſalmon ſold is eſtimated at 60,000*l.* Near the mouth of the river, a rent of 800*l.* *per annum* is paid for a fiſhery not exceeding two hundred yards in length. (See SALMON, alſo BERWICK-*upon-Tweed*.) The Blythe and Aln both fall into the German ocean, and form eſtuaries which are navigable for a ſhort diſtance, and hence are extremely convenient for the exportation of coal. The Cocquet pours its waters into the ſea near Warkworth, where there is a fiſhery for ſalmon-trout and gilſe. By a recent alteration in its channel, this river ſeems to be preparing itſelf for being an excellent harbour for ſmall veſſels. The Wanſbeck is the moſt noted of any ſtream in the county for the beauty of its banks; and is immortalized by Akenſide in his Pleaſures of Imagination. The Till, riſing among the Cheviot hills, is called Brennich as far down as Wooler. This river, after being joined by the united currents of the Bovent and Glen, falls into the Tweed. The Bovent is remarkable for fine pebbles.

*Mineralogy*.—In a mineralogical eſtimate, Northumberland is a county of diſtinguiſhed importance. Lead-ore is found in great abundance, particularly in its weſtern parts. Allendale mines have been wrought for time immemorial, and at preſent afford an annual produce of about 12,000 bings of ore, which is ſmelted and refined at Dukefield, and yields ſeven or eight ounces of ſilver for each fother of lead. The ores here have the calcareous or fluor-ſpar for their matrix, and the ſides of the mines are often richly decorated with pellucid and poliſhed cryſtals of various minerals; but never ſhew ſo much magnificence and glory as when they are interſperſed with yellow ore of copper, and with pyrites and black jack, which, in hard veins, diſplay a combination of the moſt beautiful colours nature or imagination can depict. The other lead-mines are at Shilden, near Corbridge, and at Little Houghton, in the vicinity of Bamborough. Indications of the ſame metal alſo appear near Simonburn, and in different places ſouth of the Tyne. There likewiſe have been mines in Rothbury foreſt, and at Newborough; and ore is obtained in conſiderable quantities at Fallow-Field, but the ſmall quantity of ſilver it contains is not equal to the neceſſary expence of ſmelting it. Zinc abounds in moſt of the lead-veins, and iron-ſtone lies imbedded in vaſt quantities in the ſtrata of indurated clay, throughout the whole of the coal diſtrict, which is computed to extend (including a ſmall portion of Durham) 20 miles in length, and 15 in breadth, being an area of 300 ſquare miles. The caking-coal is found in the greateſt abundance, and of the beſt quality, in that range of country lying between a line drawn from Alnemouth to Tinemouth; from thence, by the ſouth boundary of the county, into the pariſh of Bywell; and again from Bywell to Alnemouth. This diſtrict, as far as it has been examined, is found to conſiſt of various kinds of ſilicious ſtone, ſchiſtus, and coal. Beds of ſchiſtus uſually conſtitute the matrix of the coal-ſeams, both above and below, and frequently exhibit beautiful impreſſions of foſſil plants, as ferns, vetches, ears of barley, &c. and, what is remarkable, pine-apple leaves. Layers of iron-ſtone are frequent in theſe beds, generally of a rhomboidal form, but ſometimes in nodules. At Kenton, in particular, are diſcovered immenſe foſſilated trees, ſome of which have been hewn into ſeats, and ſhew the yearly rings of their growth, and alſo the roughneſs of the bark. The ſtrata of Northumberland uſually dip or incline towards the eaſt; and each ſtratum keeps its parallelism, with reſpect to thoſe immediately over or under it, through all the confuſion of the perpendicular rents and chaſms, which are denominated by miners dikes, ſlips, hitches, and troubles. Some of theſe chaſms are filled up with clay, ſand, and round ſtones, which have dropped in from the ſurface, according to the opinion maintained by Werner in his late work on the formation of mineral veins. Many of them are the receptacles of metals and beautiful ſpars; and others of baſalt, a ſubſtance bearing a near reſemblance to lava, and hence ſuppoſed to have been thrown up in a fuſed ſtate from the internal cavities of the earth, and to afford an appoſite illuſtration of the Huttonian theory. A baſalt dyke, thus formed in the coal-mine at Walker, is caſed with the cinders of coals; but in what manner this phenomenon has occurred,

occurred, it is not eaſy to determine. The great operations of nature in the economy of the globe are yet but imperfectly known; and perhaps, in the preſent ſtate of the ſcience on which their explanation peculiarly depends, cannot be inveſtigated with any proſpect of attaining a correct ſolution: nor indeed do we conceive that it ever will be poſſible to eſtabliſh their theory upon the ſame demonſtrative evidence, by which Newton and La Place have been enabled to explain the complicated, but uniform, movements of the heavenly bodies. Chemiſtry is a ſcience only admitting of the partial application of geometry, or the calculus; and therefore, of neceſſity, many of its theoretical concluſions muſt continue to reſt on a ſpecies of moral evidence alone. As far, however, as the human mind can reach in the purſuit of truth, abſtractedly from mathematical accuracy, we are hardy enough to think that geologiſts may one day carry the deciſion of the curious and intereſting queſtion, which now divides the chemical philoſophers of Europe.

Beſides the minerals already mentioned, ſeveral others of inferior importance are diſcovered in Northumberland. Lime-ſtone, of an excellent quality, abounds in almoſt all parts of the county, except in the coal diſtrict, the boundaries of which have been deſcribed, and in the porphyry tract of the Cheviot hills. Stone-marle is plentiful in many places near the Tweed, and ſhell-marle is found in a few places in Glendale Ward, principally at Wark, Sunnylaws, and Learmouth, where it has been formed by a depoſit of various kinds of ſhells, both univalve and bivalve, many of which are ſtill perfect, and form a ſtratum, ſeveral feet in depth, of fine calcareous earth. In the centre of this bed of marle is a horizontal ſtratum of ſand, about twelve inches thick, certainly a matter of curious ſpeculation to the natural hiſtorian. Some years ago, a red ſtag, in the attitude of running, and entire, was dug up here; as well as the ſcalp and horns of ſome animal of the bos taurus ſpecies, being more than twice the dimenſions of the horns of any ox or cow of the preſent day, an inhabitant of this iſland.

*Roads and Canals.*—The turnpike roads in this county are moſtly in good order, but have one material defect, which is, that they are frequently diſgraced with ſteep banks, when a trivial alteration of the line would have thrown them on a level. This remark is peculiarly applicable to both the roads paſſing over Rimſide-Moor, and to the great poſt-road, which aſcends and deſcends a great number of hills, without even the plea of being nearer, as the leveller track would have been ſhorter, travelled in leſs time, and with far leſs fatigue. Of the townſhip roads, ſome are good, but by much the larger proportion are extremely bad. As to canals, it is to be remarked, that though frequently planned, and even the neceſſary fund raiſed for their execution, not one has hitherto been put in actual progreſs.

*Manufactures and Commerce.*—Northumberland cannot be ſaid to poſſeſs any decided ſtaple manufacture. Many arts, notwithſtanding, are practiſed here upon a large ſcale; the principal of them, as may be ſuppoſed from what has been ſtated, being derived from, or connected with, the coal trade and mines, as ſhip-building, roperies, forges, founderies, copperas, coal-tar, ſoda or marine alkali, white lead, potteries, glaſs works, and a variety of others which it ſeems unneceſſary to mention. Hexham has been long noted for its manufacture of gloves, which employs about 300 perſons. Small manufactures of woollens are likewiſe eſtabliſhed at Alnwick, Mitford, and Acklington, and cotton-mills have been lately erected at Nether-Witton. The commerce of the county conſiſts in the exportation of all the articles it produces in any conſiderable quantity, and particularly in the exportation of coal, of which 12,490,707 tons were exported from the Tyne only, in eight years, from January 1ſt, 1802, to December 30th, 1809. The imports embrace almoſt every article of neceſſity, convenience, or luxury, not ſupplied within its own boundaries. Newcaſtle, Berwick, and Alnemouth are the chief ſea-ports; but numerous ſmaller harbours are diſperſed along the coaſt, and alſo on the banks of the navigable rivers.

*Political and Eccleſiaſtical Diviſions and Government.*—Northumberland is politically divided into ſix wards, and ſix hundred and thirty-five conſtableries. The names of the wards are Tindale, Morpeth, Caſtle, Glendale, Balmborough, and Cocquetdale; which contain the following borough and market-towns: Newcaſtle-upon-Tyne, Berwick-upon-Tweed, Alnwick, Bamburgh, Corbridge, Belford, Hallwhiſtle, Haydon-bridge, Bellingham, Hexham, Morpeth, North Shields, Ovengham, Rothbury, Stamfordham, Warkworth, and Wooley. It ſends eight members to the national council, *viz.* two knights of the ſhire for the county, and two repreſentatives for each of the three boroughs of Newcaſtle, Morpeth, and Berwick. The balance between the ariſtocracy and the popular party in the county is nearly equal, the intereſt of the duke of Northumberland returning one member, and the independent gentlemen and yeomen another. The church diviſions are into five deaneries, Newcaſtle, Corbridge, Bamburgh, Alnwick, and Morpeth, and ſeventy-three pariſhes, including thoſe of Bedlington, Berwick, Holy Iſland, and Norham, which, though within the confines of Northumberland, are under the civil juriſdiction of the courts of Durham. All the deaneries are within the archdeaconry of Northumberland, dioceſe of Durham, and province of York. The churches of Hexham, Allondale, and Johnlee, with their reſpective chapels, are peculiars of the metropolitan ſee; and Throckington is a peculiar in the advowſon of the dean and chapter of York cathedral.

*Population.*—According to the parliamentary returns of 1801, this county, with Berwick-upon-Tweed, compriſed 28,052 houſes, 35,503 families, and 157,101 perſons, of whom 73,357 were males, and 83,744 females. By the ſame eſtimate, 25,738 perſons were reported as employed in trade and manufactures, and 23,190 in agriculture. From the late returns (1811), a conſiderable increaſe appears to have taken place. Theſe ſtate the houſes at 29,552, the families at 37,743, and the individuals at 172,161 in number, *viz.* 80,385 males, and 91,776 females. The families engaged in trade are computed to amount to 16,547, and thoſe employed in agriculture to 10,945.

*Antiquities* form the only remaining ſubject which it ſeems requiſite to notice in this article; and it may be juſtly ſaid that few diſtricts of the ſame extent offer a more fertile, or a more intereſting field for the gratification of antiquarian curioſity.

Having been ſituated on the confines firſt of Roman Britain, and afterwards of the Engliſh monarchy, Northumberland, probably, exhibits more veſtiges of military art than any other portion of our iſland. The wall of Severus, and Hadrian's vallum, paſs through the ſouthern part of this county, and are laſting monuments of Roman induſtry and of Caledonian valour. Hadrian's rampart conſiſts of a principal agger or mound of earth, thirty feet broad at the baſe and ten feet high, and a ditch, ten feet deep and fifteen feet wide; a ſecond mound, three feet high, and ſix feet in breadth at the baſe; another ditch, twelve feet deep and twenty-four over, beſides a third agger, ſituated about ſeventy feet from the reſt of the work, meaſuring thirty feet broad at the baſe, and ten feet high. All theſe valla are of ſemicircular form,

and, as well as the ditches, conſtantly run parallel to each other. They are compoſed of turf, ſtones, and earth thrown up looſely together, and the whole work extends from near the mouth of the Tyne, entirely acroſs the iſland to the Solway Frith. The wall of Severus is ſituated only at a ſhort diſtance from this rampart, and appears to have been built of ſtone, ſometimes formed on oak piles, and was in its original ſtate from ſeven feet, to ſeven feet four inches, broad at the foundation. This wall reached beyond the vallum of Hadrian, keeping a conſtant parallelifm with that work, and was defended at ſhort intervals by ſtrong towers, all of which, except one near Harlow-hill, are mentioned by Gough as being ſixty-ſix feet ſquare, the wall itſelf conſtituting the northern ſide of each. Beſides theſe poſts on the wall, the Romans had various ſtations diſperſed through the county, of which Bremenium, Habitancum, and Corſtopium were the principal. Bremenium, indeed, was a Roman ſtipendary city of primary importance, having been, as already mentioned, the chief town of the Ottadini before the arrival of theſe mighty conquerors. This place is ſituated on the Watling-ſtreet, as well as Habitancum and Corſtopium, and ſtill retains ſtrong marks of its ancient conſequence. It is defended by three ramparts of earth, and a wall ſeven feet thick, fancifully chequered with aſhlar work of different colours. Here was formerly a hypocauſt, which has been deſcribed by Hutchinſon; and many veſtiges of antiquity, ſuch as urns, inſcribed ſtones, &c. have been frequently dug from the ruins. But ſuch relics, it may be remarked, abound in almoſt every part of the county; and are by far too numerous to admit of even a general notice, much leſs a particular deſcription, in an article like the preſent. The ſame thing may be ſaid with reſpect to the caſtellated manſions and religious ſtructures of later erection, the bare enumeration of which would occupy a volume of conſiderable magnitude. Several of theſe, however, will be found mentioned under the names of the borough or market-towns at or near which they may happen to have been placed. Some Druidical circles are likewiſe ſeen in this county, alſo croſſes, cairns, and other minor monuments of the conteſts and illuſtrious deeds of our brave though ferocious anceſtors.

The encampments here are of every form and ſize in which they are diſcovered in Great Britain; ſome of them, doubtleſs, Britiſh and Roman, and others of the Saxons, Danes, Normans, and Engliſh, and not unlikely ſucceſſively altered and occupied, after their original conſtruction, by the armies of one or more of the ſucceeding nations, who ſpread their dominion over England. The Roman roads in Northumberland are numerous. One road accompanies the Roman barriers throughout their whole extent from eaſt to weſt. The Maiden-way, called by the country people the Made-way, interſects the weſtern diviſion of the county, reaching from Caervorran to Whitley-caſtle, and thence to Whillop-caſtle in Weſtmoreland. Watling-ſtreet enters Northumberland at Ebcheſter, and croſſing the Tyne at Corbridge, divides into two branches at Bewcley, a ſhort diſtance north from the great wall. One branch paſſes through Reedſdale into Scotland, by Riſingham and Rocheſter, and the fine encampment at Mackendon: the other branch is uſually called the Devil's Cauſeway. It has at firſt an eaſterly direction paſt Ryal, towards Bolain, whence ſweeping northwards over Rimſide Moor, it enters Scotland weſt from Berwick-upon-Tweed. Connected with this road is a paved way from the eaſtern gate at Rocheſter, over Boleyard Lees by Hallyſtone to Sharperſton. Near Hallyſtone it is ten feet wide, and is ſtill very perfect. General View of the Agriculture of Northumberland, by J. Bailey and G. Culley, 8vo. 3d edit. 1805. The Natural Hiſtory and Antiquities of Northumberland, &c. 2 vols. 4to. 1767, by John Wallis, A. M. A View of Northumberland, by William Hutchinſon, 2 vols. 4to. A Hiſtorical and Deſcriptive View of the County of Northumberland, &c." 2 vols. 8vo. Newcaſtle edit. 1811. Beauties of England, Northumberland, vol. xii., by the Rev. Mr. Hodgſon, 1812.

NORTHUMBERLAND, a town of America, in Grafton county, New Hampſhire, ſituated on the E. ſide of Connecticut river, at the mouth of the Upper Amonooſuck; incorporated in 1779, and containing 205 inhabitants.—Alſo, a county of Pennſylvania, bounded N. by Lycoming; S. and W. by Dauphin and Mifflin counties; divided into 24 townſhips, and containing 27,797 inhabitants. The chief town is Sunbury.—Alſo, a flouriſhing poſt-town in the fore-mentioned county, ſituated on the point of land formed by the junction of the N. and W. branches of the Suſquehannah; regularly laid out, and containing about 120 houſes, a Preſbyterian church, and an academy; two miles N. by W. of Sunbury.—Alſo, a county of Virginia, bounded E. by Cheſapeak bay, and W. by Richmond, containing 3900 free inhabitants, and 3903 ſlaves; 12 miles from Kinſale.—Alſo, a county in Upper Canada, bounded E. by the county of Haſtings, and the portage of the Preſq' Iſle de Quinte, S. by lake Ontario, until it meets the weſternmoſt point of Little Bay; thence by a line running N. 16° W., until it meets the ſouthern boundary of a tract of land belonging to the Miſſaſſaga Indians, and thence along the tract parallel to lake Ontario, until it meets the northweſternmoſt boundary of the county of Haſtings. This county comprehends all the iſlands near to it in lake Ontario, and the bay of Quinte; and the greater part of it fronts lake Ontario.

NORTHUMBERLAND *Iſlands*, a chain of iſlands in the South Pacific ocean, near the N.E. coaſt of New Holland, running parallel to the main land, at the diſtance of five to eight miles; differing in height and ſize, ſcarcely one of them being more than 15 miles in circumference, and many not four. S. lat. 21° 28′ to 22° 26′. W. long. 209° 50′ to 210° 54′

NORTHUMBERLAND *Straits*, a narrow channel of the Eaſt Indian ſea, between the iſlands of Calamianes and the ſhoals of Apo.

NORTHWICH, a large and ancient market town, partly in the hundred of Eddiſbury, and partly in that of Northwich, in the county of Cheſter, England, is ſituated near the conflux of the rivers Dane and Weaver, at the diſtance of 18 miles from the city of Cheſter, and 174 miles from London. The ſtreets are irregular and badly paved, and many of the houſes are of conſiderable antiquity. The townſhip of Witton adjoins to Northwich, and is conſidered as forming part of the town. In the town is a parochial chapel, a ſpacious edifice, which is remarkable for the peculiarity of its choir, being ſemicircular; the roof of the nave is adorned with numerous figures of wicker baſkets, ſimilar to thoſe uſed in the manufacture of ſalt. A grammar ſchool was founded and endowed here in the year 1558, by the Rev. ſir John Deane, rector of St. Bartholomew the Great in London. The government of the ſchool is veſted in twelve truſtees, by whom the maſter and ſcholars are appointed. From the central ſituation of Northwich, the increaſe of its population, and the extenſion of the ſalt trade, this town is become a place of great reſort. A very conſiderable market is held on Fridays; and two fairs annually, which continue nearly a fortnight each, for the ſale of Yorkſhire and Mancheſter goods, and for various other commodities. In the return made to parliament in the year 1811, Northwich was ſtated to contain 324 houſes, and 1382 inhabitants.

bitants. The lower claſſes of the people derive employment from a cotton factory recently eſtabliſhed, and from the *ſalt* trade, which, though carried on to great extent in ſeveral parts of this county, is chiefly concentrated in the neighbourhood of Northwich. Here the ſalt is manufactured not only from the brine ſprings, but alſo from the natural rock, a circumſtance peculiar to this town and its vicinity: the annual quantity of rock ſalt delivered from the pits is from 50,000 to 60,000 tons; in addition to which, the brine pits yield a yearly ſupply of not leſs than 45,000 tons. See SALT.

About four miles from Northwich is Vale Royal abbey, the ſeat of Thomas Cholmondeley, eſq. A monaſtery of this name was founded here, for Ciſtercian monks, by prince Edward, afterwards king Edward I. No part of the ancient abbey is now remaining, though ſome places retain appellations connected with monaſtic diſcipline. The hall of the preſent manſion was erected in the beginning of the ſeventeenth century; it is nearly ſeventy feet in length. The wings have been recently rebuilt. The apartments are embelliſhed with numerous portraits, ſome of which are of diſtinguiſhed eminence. The library is large and valuable. Lyſons' Magna Britannia, vol. ii. Beauties of England, vol. ii. by J. Britton, and E. W. Brayley.

NORTHWOOD, an interior and elevated townſhip of America, in Rockingham county, New Hampſhire, in which, and on its borders, is a number of ſmall ponds, whoſe waters ſupply Piſcataqua and Suncook rivers; incorporated in 1773, and containing 950 inhabitants; about 39 miles N.W. of Portſmouth. Cryſtals and cryſtalline ſpars are found here.

NORTH YARMOUTH, a poſt-town of Cumberland county, in the ſtate of Maine, on a ſmall river which falls into Caſco bay; 17 miles W. by S. of Brunſwick. The townſhip, which is extenſive, was incorporated in 1713, and contains 2600 inhabitants. It is divided from Freeport on the N.E. by Cuſſens river.

NORTON, CHIPPING, a borough and market town in the hundred of Chadlington, and county of Oxford, England, is ſituated 20 miles diſtant from the city of Oxford, and 74 miles from London. Its appellation, Chipping, ſhews it to have been a town of note in the Saxon times, as Ceapan, whence it is derived, ſignifies a market or place of trade, as all the places appear to have been which have the name of Chipping-prefixed. The town is incorporated, and the government is veſted in two bailiffs and twelve burgeſſes, who are empowered by charter from James I. to hold a court and determine all actions under 4*l*. The church is a ſpacious edifice, being 98 feet long and 87 broad, and the middle aiſle 46 feet in height. Here is a free grammar ſchool, which was founded by king Edward VI. In the enumeration made purſuant to act of parliament in 1811, Chipping-Norton is ſtated to contain 383 houſes, occupied by 1975 perſons. Six annual fairs are held, and a weekly market on Wedneſday. Two burgeſſes were ſent to parliament in the 30th year of Edward I., and alſo in the 32d and 33d years of Edward III., ſince which period no return has been made.

About three miles from Chipping-Norton is an ancient monument, called the Rowldrich, or the Roll-rich-ſtones, ſtanding in nearly a circular form, the diameter from north to ſouth being 35 yards, and from eaſt to weſt 33 yards. The ſtones appear to have been originally ſixty in number; at preſent twenty-two are ſtanding, few exceeding four feet in height, and ſixteen inches thick, except one in the very north point, which is ſeven feet high, and five feet and a half broad; eighty-four yards north-eaſt from the circle, is a large ſtone called the King-ſtone, eight feet in height, ſeven feet in breadth, and about twelve inches in thickneſs. Camden thinks this monument to be a memorial of ſome victory, perhaps erected by Rollo the Dane, who invaded England in 816. But Dr. Stukeley aſcribes it to the Druids; as Rholdrwg, he ſays, ſignifies the *circle* or *church* of the Druids. To the ſame origin he attributes the ſeveral barrows contiguous to this ſpot, one of which is ſixty feet long, and twenty broad. Mr. Gough conſidered the doctor's opinion as carrying more probability with it than the crude conjectures of earlier writers. Gough's Camden, vol. i.

NORTON, a townſhip of America, in Briſtol county, Maſſachuſetts; 33 miles S. of Boſton; incorporated in 1711, and containing 1481 inhabitants. Here are manufactures of nails and of ochre.—Alſo, a ſettlement on the N.E. coaſt of Cape Breton iſland.—Alſo, a town of South Carolina; 22 miles S.S.E. of Columbia.

NORTON *Sound*, a large bay on the N.W. coaſt of North America, diſcovered by Capt. Cook in 1778, and ſo called in honour of ſir Fletcher Norton, afterwards baron Grantley. This bay extends to the northward as far as N. lat. 64° 55′. The people adjoining to this bay did not appear to our navigators to differ, either as to their ſize or features, from thoſe whom they had found on every other part of the coaſt, King George's ſound (Nootka) excepted. Their clothing, which conſiſted principally of deer ſkins, was made after the ſame faſhion; and they obſerved the cuſtom of boring their under lips, and fixing ornaments to them. Their dwellings conſiſted of a ſloping roof, without any ſide walls, compoſed of logs, and covered with graſs and earth; the floor was laid with logs, the entrance being at one end; the fire-place juſt within it; and a ſmall hole was made near the door to let out the ſmoke. Brooms and ſpruce, and alſo fiſh, were obtained in exchange for knives, beads, and other trifles; but the article chiefly valued was iron. The berries which were procured here were wild currant berries, hurtle berries, partridge berries, and heath berries. From the elevated ſpot on which Mr. King ſurveyed the ſound, he could diſtinguiſh many extenſive vallies, with rivers running through them, well wooded, and bounded by hills of a gentle aſcent and moderate height. One of theſe rivers, which runs to the N.W., appeared to be conſiderable, and to empty itſelf into the ſea at the head of the bay. The trees were found to be larger by thoſe who advanced from the bay farther into the country. The bay in which our navigators anchored, lay on the S.E. ſide of it, and was called by the natives "Chacktoole." The ſtation was indifferent, being expoſed to the S. and S.W. winds; nor is there a harbour in all the ſound. From 77 ſets of lunar obſervations, the longitude of the anchoring place, on the W. ſide of the ſound, was found to be 197° 13′. Lat. 64° 31′. Variation of the compaſs 25° 45′ E. Dip of the needle 76 25′. The night-flood roſe almoſt two or three feet; and the day-flood was hardly perceivable. Cooke's Third Voyage, vol. ii.

NORVI, a town of the iſland of Sardinia; 16 miles N.E. of Saſſari.

NORUM, a town of Sweden, in Weſt Gothland; 20 miles S. of Uddevalla.

NORUNGAH, a town of Hindooſtan, in Bahar; 33 miles W. of Gayah.

NORWALK, a pleaſant poſt-town of America, in Fairfield county, Connecticut, on the N. ſide of Long Iſland ſound, containing a Congregational and Epiſcopal church, and between 40 and 50 compact houſes; 13 miles W. by S. from Fairfield. The townſhip, which was ſettled in 1651, is ſituated in a fertile wheat country. It has iron works, and a number of mills; it carries on a ſmall trade to New

New York and the Weſt Indies, and contains 5146 inhabitants.

NORWALK *Iſlands*, a cluſter of ſmall iſlands in Long Iſland ſound, near the coaſt of Connecticut. N. lat. 41° 4′. W. long. 72° 22′.

NORWAY, anciently *Norrik*, or the *Northern kingdom*, a country of Europe, anciently an independent kingdom, but for many years ſubject to Denmark; bounded on the S. by the entrance from the Baltic, called the Scaggerac, or Categate, on the W. and N. by the northern ſea, and on the E. by a long chain of mountains under different names, which ſeparates it from Sweden. Its extent and dimenſions have not been preciſely aſcertained. Geographers have differed about its limits northward, and, therefore, ſome have made its length 1100 miles, and others have ſtated it at 750 miles, its breadth at 170, and its area in ſquare miles 71,400. Its capital has been either *Bergen* or *Chriſtiana*, which ſee. Norway is formed by nature into two great diviſions, *viz.* Northern, and Southern or Proper Norway, ſeparated from each other by the ſmall Swediſh province of Herndahl. *Northern* Norway is a long and narrow ſlip of land, extending as far as North Cape, beyond the 71ſt degree of latitude, the moſt northern point of Europe; it is divided into Nordland and Finmark, and comprehended in the government of Drontheim. *Southern* or *Proper* Norway is bounded as we have already ſtated, and is divided into four dioceſes or governments, *viz.* Aggerhuus or Chriſtiania, Chriſtianſand, Bergen, and Drontheim, which ſee reſpectively. Although Norway comprehends a large tract of territory; yet, on account of its rocky ſoil and unfavourable climate, the number of inhabitants does not correſpond to the extent of the country. The amount of its population is eſtimated at 700,000, or 750,000 ſouls. The Norwegians being the ſame race with the Danes, and long connected with them in religion and government, ſpeak the ſame language, which is a dialect of the Gothic, intermixed with ſome provincial expreſſions. In their diſpoſition and manners, they occupy a kind of middle place between the ſimplicity of the Greenlanders and Icelanders, and the more poliſhed ſtate of the Danes. They are in general robuſt and brave, but irritable and reſentful; the women are handſome and courteous; and the Norwegian forms, both of living and of enjoying property, are mild, and much reſemble that of the Saxon anceſtors of the preſent Engliſh. Every inhabitant is an artiſan, and ſupplies his family with all neceſſaries from his own manufactures; ſo that in Norway there are few, who by profeſſion are hatters, ſhoemakers, taylors, tanners, weavers, carpenters, ſmiths, and joiners.

Every peaſant, few excepted, in Norway breathes the air of freedom. This freedom they derive from a particular code, called the "Norway law," compiled by Grieffelfeld, at the command of Chriſtian V., the great legiſlator of his country. By this law, the palladium of Norway, liberty is extended to all peaſants, except a few who belong to certain noble eſtates near Frederickſtadt. And even to theſe ſerfs the ſpirit of the ſame law communicates its influence; for no proprietor can have more than one of theſe privileged eſtates, and unleſs he poſſeſſes a title or certain rank, and reſides on his eſtate, he loſes his privilege, and the peaſants become free. The benefits of this code, ſays Mr. Coxe, are ſo viſible in its general effects on the happineſs and in the appearance of the peaſants, that a traveller muſt be blind, who does not perceive the difference between the free peaſants of Norway, and the enſlaved vaſſals of Denmark, previouſly to their emancipation, though both living under the ſame government. Many of the peaſants derive their lineage from the ancient nobles, and ſome even from the royal line; on this ſuppoſed deſcent they much pride themſelves, and are careful not to give their children in marriage but to their equals in birth and blood. For the cuſtom prevalent in Norway, favourable to the peaſants, called "Odel's" or "Odhel" *right*, ſee that article. The Norwegian peaſants, ſays the author now cited, poſſeſs much ſpirit and fire in their manner; they are frank and undaunted, but not inſolent; never fawning on their ſuperiors, and yet paying proper reſpect to thoſe above them. Their principal mode of ſalute is by offering their hand, and they return thanks for a favour, not by words or a bow, but by ſhaking hands with great frankneſs and cordiality. The peaſants are well clothed and well lodged, and apparently poſſeſs more comforts than any except the Swiſs. They weave their ordinary cloth and linen, and manufacture a kind of ſtuff like Scotch plaid. The coats of the men are principally made of a ſtone-coloured cloth, ornamented with rich button-holes and metal buttons. The women, when employed in their houſhold affairs, frequently appear only in a petticoat and ſhift, with a collar reaching to the throat and a faſh tied round the waiſt. Their linen is very fine, and diſplays the figure to the higheſt advantage. Although their dreſs is in many reſpects accommodated to their climate, yet cuſtom enables them to outbrave the inclemency of the weather; for they expoſe themſelves to cold without any covering on their breaſts or necks. The Norwegians maintain their ſtrength and ability for labour, in many inſtances, to an advanced age. The common food of the peaſant is milk, cheeſe, dried and ſalted fiſh, and ſometimes, but rarely, fleſh or dried meat, oatmeal called "flad brod," baked in ſmall cakes like pancakes, uſually made twice a-year. In times of ſcarcity they alſo uſe the bark of trees, generally of the fir, which is dried and pulveriſed, mixed with oatmeal, baked and eaten like bread. As a luxury, the peaſants eat "ſharke," or thin ſlices of meat ſprinkled with ſalt, and dried in the wind, like hung beef; alſo a ſoup made like haſty-pudding of oat-meal, or barley-meal, which is renderend palatable, by adding a pickled herring or ſalted mackerel. The uſe of potatoes has been lately introduced, though they do not grow to any ſize in a country where the ſummer is ſo ſhort: Fabricius ſtrongly recommends, in times of ſcarcity, the moſſes and lichens, and particularly the "lichen iſlandicus," which yields a nouriſhing ſuſtenance, and is commonly uſed for food in Iceland.

The Norwegians maintain their own army, which conſiſts of 24,000 infantry and 6000 cavalry. The troops are much eſteemed for their bravery, and like the Swiſs mountaineers, exceedingly attached to their country. The horſes, which ſupply the cavalry, are ſmall, but ſtrong, active, and hardy. Every peaſant, not born in a town, or on ſome noble eſtate, and thoſe on the coaſt, who are claſſed as ſailors, excepted, is by birth a ſoldier, and enrolled at the age of ſixteen. From that year he continues to ſerve until he arrives at thirty-ſix, when he receives his diſcharge. The militia take the field every year in June, and remain encamped about a month. Norway can furniſh about 14,000 excellent ſeamen. This country contributes to the annual revenue about 290,000*l.*

As to the climate of Norway, it varies according to its extent, and its poſition towards the ſea. Extending along the weſt ſide of the Scandinavian Alps, and expoſed to the vapours from the Atlantic, it is not ſo cold as we might be naturally led to imagine. If we compare the climate of Norway, with that of London, March in London is like April and the beginning of May in Norway, and the March of Norway is our January. On account of the frequent

ſpring

ſpring froſts, ſeeds ought not to be ſown in gardens before the 20th of May, and the froſts of the latter end of Auguſt are no leſs detrimental. The heat and cold vary ſo much in Norway, that in June or July the mercury in Fahrenheit's thermometer not unuſually riſes at Sydeborg to 88, and on the 1ſt of January 1782 fell to — 22, or 54° below the freezing point. At Eger it fell on the ſame day to — 36½, and at Kongſberg to — 40, or 72 below the freezing point, a degree of cold by which quickſilver is congealed. This extreme riſe and fall of the mercury makes a difference of 110° between the greateſt heat and greateſt cold at the ſame place; and this difference is much more conſiderable than that at Upſal or Stockholm, which lie nearly in the ſame latitude as Sydeborg. In ſome places vegetation is ſo quick, that corn is ſown and cut in ſix or ſeven weeks. Tillage cannot be ſuppoſed to flouriſh in a country ſo rocky as in many parts to defy the plough, and where the climate is ſo ſevere that the hoar-froſts begin in September, and the cold in the highlands prevents the maturity of the corn. The ſmall vallies and the intervals between the rocks are uſually provided with a fruitful ſoil, and the induſtry of the peaſants covers the naked rocks and ſandy grounds with a new earth; yet the arable grounds are few, and no parts of Norway yield ſufficient corn for interior conſumption, except the diſtricts of Hademark, Foten, and Ringerike. Many other circumſtances counteract the induſtry of the farmer; ſo that in the moſt favourable ſeaſons, a conſiderable importation of corn is annually neceſſary; but in unfavourable harveſts the utmoſt dearth is experienced in the inland parts, as the tranſport of the corn from the ſea-coaſt is very expenſive. In order to dry the corn expoſed to heavy rains, the peaſants fix in the ground forked poles ten feet high, on which they pile the ſheaves, the lowermoſt row hanging about two feet from the ground. They are alſo frequently obliged to bake the corn in wooden ſheds, heated by means of ſtoves.

Norway, however deficient in arable land, is very rich in paſture, and abounds in cattle. The mode of keeping cows reſembles that of Switzerland. About the middle of May they are turned into meadows; towards the middle of June driven to the heights, or to the foreſts, where they continue till autumn. The cows are uſually tended by a woman, who inhabits a ſmall hut, milks them twice a day, and makes butter and cheeſe on the ſpot. On their return the cattle are again paſtured in the meadows, until the ſnow ſets in about the middle of October, when they are removed to the ſtables, and fed during winter with four-fifths of ſtraw and one-fifth of hay. The horſes are uſually foddered with hay during the winter, and are ſeldom ſent to graſs before the beginning of June. In ſome places the cattle are fed with ſalted fiſh.

Of late years agriculture has been improved in Norway, and of courſe the value of eſtates has riſen nearly one-third. This melioration is principally owing to the exertions and encouragement of the Patriotic Society, which gives premiums for the beſt improvements and inſtructions in every part of farming.

The fiſheries, particularly on the weſtern coaſt, furniſh to the natives employment and wealth, and are the means of ſupplying the beſt ſeamen for manning the Daniſh fleet in times of war. The principal fiſh, which, when dried and ſalted, ſupply a very conſiderable article of exportation, are the cod, the ling, and the whiting: and beſides, the livers yield train oil, and the ſmalleſt fiſh ſerve as fodder for the cattle. The herring fiſhery has lately been depretiated in value, as the ſhoals, which uſed to frequent the coaſt of Norway, in their progreſs from the North pole, keep at a greater diſtance from the ſhore, and thus by firſt approaching the rocks of Maeſtrund and Stroemſtrand, the chief herring fiſhery has been transferred to the Swedes. Salmon is taken partly in the bays, and partly in the rivers, as they aſcend the ſtream in ſpring for the purpoſe of ſpawning, and is cured by ſalting and ſmoking. Againſt mackerel the Norwegians have conceived a prejudice from a ſtrange notion, that ſhoals of this fiſh often attack and devour the human ſpecies when bathing in the ſea.

Norway is almoſt wholly an alpine country. The mountains of Joglefeld conſtitute the ſouthern extremity of the grand chain that ſeparates it from Sweden. In proceeding northwards Joglefeld is ſucceeded by Buglefeld, and Haklefeld. Hardangerfeld forms a more extenſive denomination, and detaches a branch towards the S.W. Under the parallel of 61° the chain aſſumes the name of Filifeld, followed by Sognefeld and Langfeld, which terminates a little beyond the 62d degree of N. lat. The chain now aſſumes a winding direction from N. to E., and this part, which is eſteemed one of the higheſt, is ſtyled Dofrafeld. After turning to the N.E. we arrive at the parts towards the parallel of Drontheim, which are generally reckoned the moſt elevated, for towards Lapland the mountains decline in height. The ſucceſſive names of this central portion are Rudfeld, Shersfeld, and Salafeld. Jornafeld and Berrafeld, and ſome other local appellations, are mentioned by the general name of the mountains of Kolen, which paſs along the E. and S. of Daniſh Lapland.

In a more general point of view, the ſouthern part of the Scandinavian chain, running nearly N. and S. and terminating at the province of Kamfdal, is called "Langfiall," or the long mountains. Hence the part called "Dofrafiall" extends towards the E., ending above the lake of Aurfund or Oreſund, where it again proceeds almoſt due N. Hence alſo a conſiderable branch proceeds by Swakku, &c. towards Sweden. Swakku, according to Catteau, is 2262 Daniſh ells (each two feet) above lake Fæmund. Bergman computes its height above the ſea to be 9000 feet. The third part of the range from the N. of Oreſund and the vicinity of the copper-mines of Roras, is called the chain of "Kolen," extending between Norway and Swediſh Lapland, and afterwards bending, in the form of a horſe-ſhoe, on the S. of Finmark. The height of theſe mountains has been variouſly eſtimated. From ſome late ſurveys we learn that the higheſt in the dioceſe of Drontheim are not more than 600 fathoms above the ſurface of the ſea; that the mountains fall to the weſtern ſide from the diſtance of eight or ten Norwegian miles; but to the eaſtern from that of 40. The higheſt is Dovre-fial in Drontheim, and Tille in Bergen. Kinnakalle, in Weſtrogothia, is only 815 Engliſh feet above the lake Wepern, or 931 above the ſea. Areſkutan, a ſolitary mountain of Jemptland, about four or five Swediſh miles from the higheſt Alps, which ſeparate Norway and Sweden, is ſaid to be 6162 Engliſh feet above the neareſt river; Swackuſto, within the borders of Norway, 4658 above lake Fæmund, and that lake is thought to be 2 or 3000 above the ſea; and Sylfiællen, on the borders of Jemptland, is 3132 feet perpendicular from the height to the baſe. As to the conſtruction of the Norwegian mountains, nothing abſolutely certain is known, as they have not been much explored. Some of them conſiſt of ſandſtone, of the ſiliceous, argillaceous, or calcareous kind. According to Bergman, many of the mountains of Norway are of pudding-ſtone, ſometimes of quartz pebbles, cruſted by a grey micaceous cement. Some are of hornblende ſlate in which garnets appear. This country abounds with marble, and the lapis ollaris is found in great quantities, ſo that the cathedral of Drontheim and

other

other edifices were built with it. This is ufually found in the vicinity of granite; aſbeſtos and amianthus alſo indicate granite; and rock-cryſtals are found of large ſize and beauty, with talc, garnets, and amethyſts. Chalk and flints are unknown. Norway abounds in various metals. Some gold ore was found in 1645 near Arindal; the gold mine of Edſwold, about 30 miles N. of Chriſtiania, was diſcovered in 1758, but its produce was inconſiderable: it is on a vein of quartz and pyrites. The ſilver mines of Kongſberg, about 40 miles S.W. of Chriſtiania, have been long reputed the richeſt in Europe. According to Bergman's account of them, the rock conſiſts of vertical banks of micaceous ſchiſtus, with garnets, lime-ſtone, and quartz. The richeſt veins are in thoſe of a greyiſh quartz mingled with ſmall black mica, and reddiſh petroſilex; but eſpecially on a fine-grained white quartz, and a little calcareous earth, or where the quartz and mica are in alternate ſtrata. The ferruginous layers are moſt productive. Theſe mines of Kongſberg were diſcovered by the threads of native ſilver on the rock; and Jars ſays, that moſt of the mines now worked were diſcloſed by the ſame means. The gangarts are calcareous ſpar, fluor, and mountain rock; and the native ſilver is alſo found in a grey rock (hornblend), which may be regarded as the top and bottom of the mine. The diſcovery of the mines of Kongſberg was made in 1623 by two peaſants, who were diverting themſelves with throwing ſtones; and in conſequence of this diſcovery the town of Kongſberg was founded; which became a flouriſhing town of 6000 inhabitants. They are wrought by 36 ſhafts, and uſed to yield about 70,000*l.* annually, when 4000 men were employed. Norway alſo poſſeſſes other ſilver mines at Iarlſberg, about 30 miles N.E. of Kongſberg, diſcovered in 1726, but of ſmall account. The important copper mines of Roras, about 46 miles S.E. of Drontheim, were diſcovered in 1644. They are in the ſouthern ſlope, the chain of Dofra. Theſe mines are very productive, and a ſource of conſiderable revenue. The copper mines are at Quickne and Selboe, about 50 miles E. of Drontheim, and at other places, as Meldal and Foledal. There are alſo mines of cobalt at Foſſan, which are ſaid to produce a clear annual revenue to the crown of about 35,000*l.* But the iron mines of Norway are the moſt profitable; they are chiefly ſituated not far from Arindal, in the province of Chriſtianſand, and near Skeen, between Arindal and Kongſberg. Lead appears in the vicinity of Kongſberg; and there are alum works near Chriſtiania. Jade and magnets, and rock-cryſtals, are alſo found in Norway, with curious garnets, eſpecially the green.

The Norwegian mountains are generally clothed with pines and firs; and almoſt the whole country may be regarded as a foreſt, which ſupplies Europe with maſts and other timber. The timber is applied to ſeveral purpoſes, being exported in large quantities, and uſed for ſpars, beams, and planks, for building, as moſt of the houſes in Norway are conſtructed of wood, for the roads, which, eſpecially in the northern parts, are almoſt entirely formed of wood, for turpentine, for fencing and incloſing the fields, for fuel, and for manure. The pine or fir, and alſo the elm, are dried and powdered, and mixed with meal for feeding ſwine. The birch is uſed for various purpoſes; the outer bark is employed for covering the roofs of houſes, and the inner is applied like the bark of oak for tanning hides, fiſhing nets, and ſails. It ſupplies alſo, by tapping, a kind of wine. The twigs of the birch, as well as the alder and aſpen, are given to horſes in ſcarcity of fodder. A decoction of oak-leaves is uſed by the peaſants as a fomentation for the rheumatiſm.

Norway abounds with lakes and rivers. Many of the former are ſo large that they appear like inlets of the ſea. The moſt extenſive are in the ſouth of Norway. The chief of theſe are the lakes of Mioſs, Rands, Tyri, Ojeren, Or, Kowen, Tonhof, Tind, Huide, Niſſer, Kiel, and Syredal. Farther to the N. is the lake of Fæmund, that of Sælbo, and thoſe of Beitſtadt and Snaaſen. The largeſt rivers are called Elven or Elben. The chief river of Norway is the Glom or Glomen, full of cataracts and ſhoals; it ſprings from the lake of Oreſund, and runs nearly S. about 300 miles. Next to this is the Dramme, which flows into the bay of Chriſtiania, not to mention the Louwen, the Torriſals which runs by Chriſtianſand, and others flowing from numerous lakes. Among the quadrupeds of Norway we may reckon its horſes, which are ſmall, cows, ſheep, goats, ſwine, dogs, cats, deer, roebucks, hares, rabbits, rein-deer, bears, elks, wolves, lynxes, foxes, gluttons, martins, ſquirrels, badgers, otters, ermines, beavers, porcupines, moles, rats, and mice. Of its birds we ſhall mention only the elk or razor-bill, peculiar to this country, and uſeful on account of its feathers, and the eider-duck, valued alſo for its feathers. It has great variety of fiſh. See KRAKEN.

The general exports of Norway are tallow, butter, ſalt, dried fiſh, timber and planks, horſes and horned cattle, ſilver, alum, Pruſſian blue, copper, and iron. The number of ſhips above 10 *laſts* belonging to Norway, in the year 1799, was 747. The religion of this country is the Lutheran, and its biſhoprics are four. (See DENMARK.) The Norwegian coaſt preſents one continued ſeries of ſmall and unimportant iſlands, moſt of which are uninhabited; among theſe we may name Karm, Bommel, Jartar, Hitteren, and others at the entrance of the gulf of Drontheim, the Vikten or Vikton iſlands; and thoſe of Loffodee, noted for the whirlpool of Malſtrom. For many years the Norwegians held the iſles of Orkney and Shetland.

Norway, as we have already ſaid, was formerly an independent kingdom, and governed by its own hereditary ſovereigns. Its original population conſiſts of Fins and Laplanders; and its ſovereignty, originally founded in the S.E. part of Norway, around the modern city of Chriſtiania, was gradually extended, and Harold Harfagre, about A. D. 910, became maſter of all Norway. In the reign of Olaf I. Norway and Zealand were converted to Chriſtianity. On the demiſe of Hagen or Haken V. in 1319, without male iſſue, his grandſon in the female line, Magnus Smok, united the kingdoms of Sweden and Norway. Magnus was ſucceeded on the throne of Norway by his ſon Hagen or Haken VI., who married Margaret, daughter of Waldemar III., king of Denmark, A. D. 1363; and in conſequence of this marriage the three crowns of the north were united. On the death of her ſon Olaf V. Margaret aſcended the throne of Denmark and Norway in 1387, and that of Sweden in 1389. On her death the crown deſcended to her huſband, as ſome ſay, or according to others, to her nephew, Eric of Pomerania. Sweden was afterwards ſeparated from Denmark by the valour and addreſs of Guſtavus Vaſa; but Norway has continued united to the crown of Denmark. Coxe. Pinkerton. See DENMARK and SWEDEN.

NORWAY, a townſhip of New York, in Herkemer county, incorporated in 1792, and containing 1911 inhabitants.—Alſo, a poſt-town in Cumberland county, Maine, incorporated in 1797, having 609 inhabitants.

NORWAY *Rat*, in *Zoology*. See MUS.

NORWICH, in *Geography*, a city of Norfolk, England, is diſtinguiſhed in the commercial annals of Great Britain for its manufactures, and in the topographical hiſ-

tory of the iſland for the memorable events that have occurred here, for its numerous antiquities, and for various other objects, which we are about to inveſtigate and explain. The city chiefly occupies the top and ſides of a gentle hill, which runs parallel with the river Wenſum on its weſtern ſide, and terminates at a ſudden bend of it. At this turn, and near that termination, a caſtle, or military ſtation, appears to have been eſtabliſhed at an early period, and as the people congregated round it for perſonal ſecurity, or private advantage, they gradually formed and augmented the town. Of Norwich, in its preſent ſtate, it has been ſaid that it ſtands upon more ground, comparatively with its population, than any city in the kingdom, the buildings being generally interſperſed with gardens, which latter circumſtance has given riſe to its appellation of a "city in an orchard." The ſhape, or plan, is irregular, approaching that of a cornucopia, or bent cone; and has not unaptly been compared to the figure of a ſhoulder of veniſon. It is rather more than one mile and a half in length, from Conisford gate, in King-ſtreet on the ſouth, to Magdalen gate on the north; and one mile and a quarter broad, from Biſhop's gate on the eaſt, to St. Benedict's gate in the weſt.

Beſides the cathedral, it contains thirty-ſix churches, and ſeveral chapels or meeting-houſes of various denominations: it has five bridges over the river, one of iron and four of ſtone. The whole city was formerly ſurrounded, except on the ſide towards the river, by an embattled wall, flanked with forty towers, and had twelve gates; the former is dilapidated, and the latter have been taken down.

*Hiſtorical Events.*—The original foundation of Norwich is eaſily to be aſcertained. Soon after the Romans eſtabliſhed themſelves in Britain, they either erected fortreſſes near the Britiſh towns, or invited the ſubdued natives to aſſemble round the Roman military ſtation. Hence it is that many of our chief cities and towns occupy the ſcites of ſuch fortified poſts, or are in the immediate vicinity of them. Thus it is probable that Norwich originated in the decay of Venta-Icenorum, as Saliſbury aroſe out of Sorbiodunum, or Old Sarum. An old diſtich commemorates the former event.

"Caſtor was a city, when Norwich was none;
And Norwich was built with Caſtor ſtone."

"I have nowhere met with the name of Norwich," ſays Camden, "before the Daniſh invaſion. So far from its being founded by Cæſar or Guiteline the Briton, as is pretended by thoſe who embrace every ſtory without weighing it." On the origin of the name, multifarious opinions have been formed; leaving the wild conjecture of Polydore Virgil, who thought he plainly diſcovered Norvicus in the word Ordo-vices, the name of a Britiſh tribe who inhabited the oppoſite part of the iſland, which opinion was afterwards adopted by Dr. Caius; there can be no room for doubt that this place received its appellation from the Saxons; the word Northwic, in their language, ſignifying a northern ſtation, caſtle, or town. And on the Saxon coins of various reigns, the word occurs in their exergue, with the mint-maſter's name. Blomefield, in his Hiſtory of Norwich, has enumerated ſeveral of theſe. Thus it appears from the moſt authentic documents, that Norwich was a place of note previous to the Daniſh dynaſty.

On the dereliction of Britain by the Romans, the Saxons ſent their own troops to this part of the coaſt, under a pretence of aſſiſting the Britons againſt their northern enemies. But quickly changing the character of auxiliaries into that of invaders, they began to erect fortreſſes to defend the poſſeſſions they had ſeized, and enable them to execute their plan of finally occupying the whole iſland. At this period the caſtle of Norwich, or the fortification on the Wenſum, was probably conſtructed. The elevated ſpot on which this caſtle ſtands,—a promontory at the north-weſtern extremity of a ridge of land which extends from the ſcite of the ancient Caſtor to the Wenſum, and commands a proſpect over a large ſpace of country,—pointed it out as an eligible place to fix an advanced poſt. The Eaſt Anglian monarchy was probably eſtabliſhed between the years 530 and 540, and the caſtle erected about the ſame period. In the year 642 it is ſaid to have been a fortified royal ſeat of Anna, the ſeventh king of the Eaſt Anglian line. During the numerous incurſions of the Danes it was frequently poſſeſſed by them and by the Saxons alternately. Its ſituation rendered it an object of importance to the former, and it appears to have been occupied by Ingwar, a Daniſh chief, in the year 870, when king Edmund was aſſailed in his palace at Hoxne, and killed by his enemies. The Danes took poſſeſſion of the country, wintered at Thetford, and uſurped the monarchy of Eaſt Anglia. The reign of Alfred was diſtinguiſhed by his repeated and deciſive victories over thoſe northern marauders; and one grand object of that monarch's care was to fortify the principal parts of his kingdom againſt hoſtile attacks; caſtles and cities which had been deſtroyed or dilapidated, he rebuilt, and conſtructed ſeveral new and ſubſtantial fortifications, which enabled him to make ſuch military diſpoſitions as the impetuous invaders were never able effectually to counteract. At that time finding the walls or ramparts of Norwich caſtle incompetent for repelling the mode of attack adopted by the Danes, he cauſed others to be erected with the moſt durable materials, whereby he greatly improved its fortifications. That it was a military ſtation of note, and a royal caſtle, in his time, is evident from the coin ſtruck here about the year 872. In the reign of Etheldred, the caſtle is deſcribed to have been utterly deſtroyed by the army under Sweyne, king of Denmark, in the year 1004. This monarch was afterwards defeated by the Saxon earl Ulfkettle, and obliged to fly to Denmark. In 1010 the Danes again returned, and ſettled at Norwich, which they fortified. The caſtle appears to have been rebuilt by Canute, on his acceſſion to the throne of England, about the year 1018, at which time its cuſtody was entruſted to Turkil. The government was afterwards beſtowed on Harold, who, ſucceeding to the Engliſh throne, conferred this caſtle on a Saxon thane, named Leofric. Soon after the Norman conqueſt, king William appointed Ralph de Waher to the earldom of Norfolk, and gave him this caſtle for his reſidence. That nobleman joined in rebellion with Waltheof, the powerful earl of Northumberland, but, having been defeated, he retreated to his caſtle of Norwich, which being inveſted by the royal army, he withdrew to Normandy, leaving to his counteſs the charge and defence of the fortreſs. The garriſon, chiefly conſiſting of Armorican Britons, made an obſtinate reſiſtance, not yielding to the beſiegers till compelled by the imperious neceſſity of famine; and then it obtained an honourable capitulation. The earldom and caſtle, thus confiſcated, were conferred, A.D. 1077, on Roger Bigod, another of his Norman followers. After he was poſſeſſed of this important fortreſs, being in the intereſt of Robert Curthoſe, duke of Normandy, he retained it againſt William Rufus. Peace being ſigned between the two royal brothers, earl Bigod was guaranteed, by a prior ſtipulation, in his landed poſſeſſions, and the government of the caſtle. In the reign of Stephen it was ſeized by the crown, but again conferred upon the family of Bigod. In the reign of Henry II. it is ſtated by ſome writers, that Roger Bigod,

who then poſſeſſed this fortreſs, rebuilt, or materially altered, the caſtle, and that the preſent keep-tower is part of the work then erected. The ſame authors obſerve, that the caſtle was now rendered impregnable, but this is evidently a mis-ſtatement, for in the reign of king John, Hugh Bigod was expelled, and William Marſhall, earl of Pembroke, with John Fitzherbert, aſſociated in the ſhrievalty of Norfolk and Suffolk, and were appointed, by patent, conſtables of the caſtles of Norwich and Orford. Of theſe fortreſſes, Hugh de Burgh, afterwards earl of Kent, was made governor. In the year 1240, the cuſtody was committed to Hamon Paſſelow, to hold during the king's pleaſure. In the reign of Henry III., Lewis of France ſent troops into England, to aſſiſt the barons, when Norwich caſtle was beſieged, and forced to capitulate. Thomas de Brotherton, ſecond ſon of Edward I., obtained the honor and cuſtody of it from the Bigods. In the time of Edward II. the honor conſiſted of one hundred and twenty knights' fees; which were equal to eighty-five thouſand acres of land. The power of the earls appears ſoon after this to have been abridged, for the ſheriff of the county was authorized by the king to uſe the caſtle for a priſon, to keep perſons charged with crimes in ſafe cuſtody, till the itinerant juſtices ſhould hold their courts of oyer and terminer. This authority of the ſheriffs was repeatedly reſiſted by the earls, which occaſioned an act to be paſſed in the fourteenth year of Edward III., empowering the former to have the privilege of the ſame gaols and priſons as they formerly uſed.

*Of the Architecture, ancient and preſent State of the Caſtle.*—Some antiquaries contend that the chief part of the preſent fabric was conſtructed by king Canute; and Mr. Wilkin, in the "Archæologia," remarks, that "although the building is of *Daniſh* workmanſhip, it is, notwithſtanding, in the taſte of architecture practiſed by the Saxons, long before England became ſubject to the Danes; and is the beſt exterior of this kind of architecture extant." Blomefield conceives that the preſent ſtructure was erected by Roger Bigod, in the time of William Rufus, and that it occupies the ſcite of a *brick* building, which was raiſed by Canute. He alſo thinks it was conſiderably repaired and beautified by Thomas de Brotherton, in the time of Edward II. Gurdon, in his Eſſay towards a Hiſtory, &c. of this Caſtle, contends for its Daniſh origin, and ſays that Canute's arms were "lions paſſant guardant;" and that the impoſt ſtones of the great portal, in the eaſtern front, have two lions carved on them in baſſo-relievo. From the ſame circumſtance, Camden aſcribes the building to Bigod. Mr. King, while he contends for the architecture being Saxon, ſuppoſes the keep-tower to have been built in the time of Canute. "As to the keep, or maſter tower," he obſerves, "the only conſiderable part now ſtanding, the ſtyle of its architecture is, in many reſpects, ſo different from that of the towers erected in the reigns of William Rufus, and Henry I. and II., and the ornaments are ſo different from thoſe which were in uſe in the reign of Edward II., when pointed arches had been long introduced, and were eſteemed the moſt elegant of any, that I cannot but think the building of much greater antiquity (*i. e.* than the time of Bigod and Brotherton), and completely Saxon, though it is poſſible the ſtaircaſe might be repaired, or even rebuilt, by Thomas de Brotherton, whoſe arms are to be ſeen on part of the wall. In ſhort, as to the main body of the building, I take it to be the very tower which was erected about the time of king Canute, who, though himſelf a Dane, yet undoubtedly made uſe of many Saxon architects, as the greater part of his ſubjects were Saxon. And I am the more induced to form this concluſion, becauſe I can find no authentic account whatever of the deſtruction of the caſtle built in Canute's time, either by war or by accident, or of its being taken down, in order to erect the preſent ſtructure, as is ſuppoſed by ſome."

The promontory on which the keep is built, appears to be a natural elevation, excepting ſome little addition which may have been made by art, by throwing out the earth from the inner foſs; for it is obſervable that the ground from the caſtle a mile ſouthward, is nearly on a level with the upper ballium, although it declines to the weſt, and is rapidly declivous towards the river on the eaſt. The area of the ancient caſtle, including its outer works, contained about twenty-three acres, the whole of which was ſurrounded by a wall. This ſpace comprehended three *ballia*, each defended by a lofty vallum and deep foſs. The principal entrance was by *Bar*, now Bere-ſtreet, through Golden-lane, by the Barbican gate, which was flanked by two towers, and connected with the external vallum by a wall. On the eaſtern ſide, towards the river, was a poſtern, which led to a circular advanced redoubt, where the river forms a double or horſe-ſhoe bend. On the inſide verge of the outer vallum was a ſtrong wall, the ſpace included between which and the middle foſs conſtituted the firſt ballium. The ſecond ballium compriſed the ſpace between the middle and inner foſs, and was defended by a ſimilar wall. The upper ballium, as it was termed, becauſe its altitude far exceeded the other two, circumſcribed the citadel. The walls, according to Groſe, "were commonly flanked with towers, and had a parapet embattled, crenellated, or garreted; for the mounting of it there were flights of ſteps at convenient diſtances, and the parapet often had the merlons pierced with long chinks, ending in round holes, called œilets."

The walls of the city, built in the year 1294, were thus formed; but it does not follow that thoſe of the caſtle, erected at a more remote period, were ſo conſtructed. They have long been down, the outer and inner valla levelled, and the foſſa filled up for building, and other purpoſes. Near the ſouth-weſt angle of the inner ballium is the ſquare keep-tower, the antiquity and architecture of which have afforded a very fertile theme for diſputation. "Its extent from eaſt to weſt, including a ſmall tower, through which was the principal entrance, is 110 feet 3 inches; and from north to ſouth, 92 feet 10 inches; and the height to the top of the merlons of the battlements, 69 feet 6 inches. The height of the baſement ſtory is about 24 feet, the outſide of which is faced with rough flint, and has no external ornament, except two arches on the weſt ſide." From the baſement ſtory upwards, the whole building conſiſts of three ſtories, each ſtrengthened by ſmall projecting buttreſſes, between which the walls are ornamented with ſemicircular arches, reſting upon ſmall three-quarter columns. The backs of ſome of theſe arcades are decorated with a kind of reticulated work, formed by the ſtones being laid diagonally, ſo that the joints reſemble the meſhes of a net. To give it a greater richneſs of effect, each ſtone had two deeply-chaſed lines, croſſing each other parallel with the joints, ſo as to exhibit a moſaic appearance. On the eaſt ſide of the keep is a projecting tower, of a richer kind of architecture, called Bigod's tower; and as it is evidently of the Norman ſtyle, it was probably an addition to the original building, made by Roger Bigod, in the time of William Rufus. The interior of the keep is an unroofed area, but was formerly divided by floors, covered in at top, and ſeparated into ſeveral ſpacious apartments. The baſement floor appears to have been vaulted over with ſtone, ſome veſtiges of which are ſtill to be traced. It is conjectured, that the well was ſituated nearly

nearly in the middle of the keep. Within this fortreſs there was formerly a royal chapel, exempt from all epiſcopal juriſdiction.

The caſtle precinct contains ſix acres, one rood, and thirteen perches, and the ſummit of the hill is in circumference 360 yards: the whole of the latter is incloſed with iron paliſadoes and gates. Under an act of parliament, paſſed in 1806, the caſtle and its limits are veſted in the juſtices of the peace for the county, in truſt; by which they are empowered to build, repair, or alter any part belonging to it, as they may think proper.

*Civil Hiſtory of the Town and City, its Progreſs, Charters, Liberties, Wards, Pariſhes, political Hiſtory, Population, &c.*— The town of Norwich probably ſoon ſucceeded the building and eſtabliſhment of the caſtle, and was originally occupied by the Romanized Britons from Venta Icenorum, and the Saxons, who came firſt to aſſiſt, and afterwards to ſubdue them. During the Daniſh incurſions, it is ſaid to have been burnt by Sweyne, who ſailed with his fleet up the Wenſum. According to ſome writers, it was chiefly occupied, at this time, by merchants and fiſhermen: but if ſo, conſiderable alterations muſt have taken place in the courſe and extent of the river; for it muſt appear ſtrange that ſuch perſons would form a ſettlement at a place between 30 and 40 miles from the ſea. It is evident, that very material alterations have been effected in the tide rivers on the Engliſh coaſt, ſince the Romans left the country; and theſe changes have occaſioned much embarraſſment to topographers, and produced apparent contradictions in their writings. If the town was rebuilt by Canute the younger, in the year 1018, it muſt have had a rapid increaſe; for in the time of the Confeſſor, it appears to have had 25 churches, and 1320 burgeſſes. At this time, the property, excluſive of the Newburgh, was divided amongſt four proprietors. Of the part in which dwelt 1238 burgeſſes, the king and the earl of Norfolk had *ſac* and *ſoc;* 50 were amenable to the court of Stigand; and of 32, Harold had the *ſoc, ſac,* and patronage. Hence, at that period, the town appears to have exceeded, in the number of burgeſſes, either Lincoln, Ipſwich, Cambridge, or Canterbury. It was then deemed a hundred of itſelf, containing 833 acres of land and meadow, having alſo a ſheep-walk within its juriſdiction; ſo that it muſt have extended nearly a mile beyond the limits marked out by the preſent foundations of its walls. During the peaceable reign of Edward, and that of his ſucceſſor Harold, it continued rapidly to increaſe both in wealth and population; but in the year 1075, by the ſiege it endured in the rebellion of Ralph de Waher, it ſuffered prodigiouſly, and experienced a ſerious decreaſe. Many of the citizens, who had eſpouſed the earl's cauſe, fled; others were baniſhed by the king's general, Waleram, as aiders and abettors; and ſome were forced to quit the place from circumſtantial neceſſity, it having been partially burnt during the ſiege, by which they were deprived of the means of reſidence. Between the years 1083 and 1086, in which the general ſurvey of the whole kingdom, contained in Domeſday-book, was made, it appears that numerous houſes were vacant, though the number of churches had increaſed; there being, by the firſt part of the ſurvey, 25, and, by the ſecond part, 54.

The number of burgeſſes, at this time, began again to increaſe, and the houſes amounted to 738; which, allowing ſix perſons for each houſe, makes the number of inhabitants at that time 4428. Though Norwich then contained this comparatively ſmall population, yet it was in ſize ſecond only to York, excluding the metropolis, as appears by the following eſtimate of the moſt conſiderable places in the kingdom. York contained 1118 families, Norwich 738, Ipſwich 538, Exeter 315, Canterbury 262, Hertford 146, Warwick 113, Southampton 84, Bath 64, and Northampton 60. Enjoying an interval of domeſtic peace, in the reign of William Rufus, and the biſhop's ſee being removed here from Thetford, a conſiderable addition was made to its population, by the vaſt influx of Jews, who about that time came over from Normandy. They had firſt been allowed to ſettle in England by the Conqueror, as chapmen for the confiſcated goods of his ſubjects; and, encouraged by his ſon and ſucceſſor, their numbers were greatly increaſed. In the reign of Henry I., the government of the city was ſeparated from the caſtle juriſdiction; and in the following reign of Stephen, Baker, in his Chronicle, ſays, "the king gave licence to the city of Norwich to have coroners and bailiffs; before which time they had only a ſerjeant for the king, to keep courts." This was conſidered as the dawn of the corporation; and in the time of Richard I., A.D. 1193, the inhabitants of Norwich were recogniſed under the title of citizens. In conſequence of a repreſentation how much the place had ſuffered, in the rebellion of the barons againſt king John, and at other times, the citizens obtained leave to ſurround the city with a wall, and to erect gates and bulwarks for its defence. Theſe were begun in the year 1297, and finiſhed 1320; but they were not completely fitted up and fortified till the reign of Edward III., A.D. 1342. At that time, Richard Spynk, a wealthy citizen, erected additional walls, and towers, with portcullises to the gates, and furniſhed the garriſon with various military engines, ammunition, &c.

The year 1336 will ever be memorable to the inhabitants of Norwich, for the influx of a numerous body of ingenious Flemings, and the introduction of the worſted manufactures, which are ſtill denominated Norwich-ſtuffs. This city has ſuffered greatly, at various times, by the plague, and ſcarcity; and few places have ſuſtained greater loſſes from accidental fires. Theſe are attributable, not only to the quantities of timber uſed in building, but to the imprudent practice of covering the houſes with ſtraw, a cuſtom not yet entirely diſuſed. Two deſolating fires, which happened at the cloſe of Henry VIIth's reign, induced the corporation to iſſue an order, that no new erected buildings in the city ſhould be covered with thatch. The proſperity of the place, which had begun to decline, was revived in 1566, by the ſettling here of three hundred and thirty Dutch and Walloons, who had fled from the Netherlands during the violent perſecution under the duke of Alva. In 1571 the number had increaſed to 3925, and by the invention of bombazines, and other articles in the weaving manufacture, they contributed much to the general population of the place. In 1574, when a rumour was ſpread of invaſion, by means of the Invincible Armada, Norwich, towards the general defence, exhibited on its muſter-roll 2120 able men; 400 of whom were armed. In 1578 queen Elizabeth made a progreſs through the county, and took up her abode for ſeveral days in this city, where ſhe was entertained with great hoſpitality and loyalty. In the time of Charles I. the city declared for the parliament, and during that rebellion it was poſſeſſed by their forces, till Cromwell was declared protector of the realm. In the year 1663 the charter was renewed by Charles II.; it was reſumed by James II., or at leaſt the privileges ſuſpended, and reſtored to its full extent again in 1688. By virtue of this, the government is veſted in a mayor, recorder, ſteward, two ſheriffs, twenty-four aldermen, of whom the mayor is one, and ſixty common councilmen; a town-clerk, chamberlain, ſword-bearer, and other officers. In the third year of queen Mary's reign, A.D. 1556, the extent of ground, called "the city and county of

Norwich," was aſcertained and confirmed, by which it appears to be fourteen miles in circumference, comprehending nearly 6630 acres. The meaſurement from the Guildhall, in the market place, to Mile-croſs, on the north, is one mile and ſix furlongs; to Thorpe, eaſt, one mile and four furlongs; to Harford bridges, ſouth, two miles and two furlongs; to Earlham Bounds, weſt, two miles and four furlongs.

Norwich was early repreſented in parliament; it received the firſt ſummons in the twenty-fifth year of Edward I. to ſend members to the national council; but it is unknown who were returned on that occaſion; the liſt of parliamentary burgeſſes commencing the following year. In 1403, the fourth year of Henry IV., the king's writ ſummoned *four* citizens to be returned to parliament for this city: but ſo far was amplitude of repreſentation then from being conſidered an extent of patronage, that the city employed John de Alford to obtain the king's licence to ſend *two only*, as before; whoſe ſervices were remunerated by the payment of three pounds. The king evidently meant to confer additional honour upon the citizens by this extraordinary privilege; but burgeſſes in parliament at that period were allowed wages for their attendance, and the citizens objected to this diſtinguiſhed mark of royal favour, upon the ground of additional expence. The city at preſent ſends two members, who are choſen by the freeholders, and by certain other perſons who are free of the city by inheritance, ſervitude, or purchaſe. The ſheriffs for the time being are the returning officers. By a private ſtatute, paſſed in the year 1738, "for the better regulating elections in the city of Norwich," it is enacted, "that the right of election is in the freeholders, and ſuch freemen of the city only as are entered in the books, and do not receive alms or charity."

Till within a few years, the population of Norwich had been increaſing. From the year 1693, in which the firſt accurate enumeration was taken, to 1752, the number of inhabitants had increaſed 7288, which is rather more than 123½ annually. From the year 1752 to 1786, the increaſe was 3882, or rather above 121 for each year.

*Manufactures, &c.*—No place in the kingdom, Mancheſter excepted, has made a more diſtinguiſhed figure in the weaving trade than the city of Norwich. At what era of our hiſtory the art of manufacturing cloth from wool was firſt practiſed in this iſland, is not recorded. Like many other neceſſary and uſeful arts, its origin is wrapped in the oblivion of diſtant ages, and from that circumſtance, it is highly probable, this was amongſt the moſt early diſcoveries. Anterior to the time of William the Conqueror, woollens of various qualities and texture compoſed the principal manufactures; but ſoon after that period a ſort of cloth work was introduced, which, though not a new diſcovery, had not been previouſly practiſed in England. This was a totally different production from what had uſually been denominated cloth; the preparation being by a combing inſtead of a carding proceſs. By the former the wool is drawn out to a very long, in the latter to a ſhort ſtaple; that is, the fibres of the fleece are extended the whole length in the one inſtance, and broken and internected in the other. The art of combing wool is attributed, as a diſcovery, to Blaſius, a biſhop of the eaſtern church, in the fourth century, who is ſtill venerated by the woolcombers as the patron ſaint of their trade. Reſpecting the time it was firſt exerciſed in this county, different opinions have been entertained. Owing to an inundation in Flanders, numbers of the inhabitants of that province came over to this country in the time of Henry I. Some of them ſettled in Pembrokeſhire, and Blomefield ſuppoſes, that others fixed their abode, firſt at Worſtead, and afterwards at Norwich: and from their ſetting up the making the articles manufactured from jerſey, or combed wool, at the former place, ſuch have ever ſince been denominated worſted ſtuffs. In the reign of Edward II., a patent was granted to John Pocock, inveſting him with the excluſive privilege of meaſuring every piece of worſted ſtuff made in the city of Norwich, or county of Norfolk. But this having been found to operate as a reſtraint on the trade, the letters were ſoon afterwards recalled. What tended to increaſe, and raiſe to an enviable height, this ſpecies of manufacture, was the number of Flemiſh artiſans who came over in the year 1336. Their arrival was occaſioned by the great intercourſe at that time kept up between this country and the Netherlands, the Engliſh king having married Phillippa, daughter of William, earl of Hainault. The diſcovery of fullers'-earth, about this period, a ſubſtance ſo uſeful in the trade, and with which England abounds, contributed greatly to further their exertions in the weaving craft. Various ſtaples were appointed for the ſale of wool, and its exportation was prohibited under heavy penalties. On this occaſion, the city of Norwich was fixed for the ſtaple of the counties of Norfolk and Suffolk. In the time of Richard II., and ſucceeding reigns, various ſtatutes were enacted for the encouragement and regulation of the trade, by further prohibitions againſt ſending unmanufactured wool out of the kingdom, and for the meaſuring the manufactured articles, as well as for the ſale of cloth. In the twenty-third year of Henry VI., an act paſſed, ordering four wardens to be choſen for the city of Norwich, and four others for the county of Norfolk, "to do right, and make due ſearch of worſteads in Norwich and Norfolk, and which ſhall ſet down orders for the *true making thereof*." It having been diſcovered in the following reign, "that divers perſons in Norwich and Norfolk make *untrue* wares, by which means they loſe their ancient eſtimation beyond ſea, &c." The number of wardens was increaſed. From this act it ſeems, the trade had arrived at ſuch a degree of excellence, as to rival other nations in the foreign market; and Engliſh goods probably then obtained an extenſive ſale in thoſe very countries whence the art had firſt been imported. In the time of Henry VIII., according to Blomefield, the ſale of ſtuffs made in the city of Norwich only, amounted to the annual ſum of 200,000*l.*, excluſive of ſtockings, which was computed at 60,000*l.* more. Not only did the trade thus flouriſh at Norwich and Worſtead, but it had now ſpread over the country; for, by an act paſſed in the fourteenth year of this reign, it appears "that the making of worſteds, ſaies, and ſtammins, which had greatly increaſed in the city of Norwich, and county of Norfolk, was now practiſed more buſily and diligently than in times paſt at Yarmouth and Lynn." The wardens of theſe towns, therefore, were put under the controul of the juriſdiction of Norwich. During the reigns of Edward VI. and queen Mary, new articles of manufacture continued to be introduced, and new regulations paſſed for the making of ruſſels, ſatins, ſatins-reverſes, and Naples-fuſtians, as had been done before for the making of hats, dornicks, and coverlets; and the manufacturers of ſuch new articles were formed into a corporation, endowed with excluſive privileges. Subſequent to this the trade fell into decay, and a new era of its revival commenced. By the advice of the duke of Norfolk, queen Elizabeth was induced to offer an aſylum in her dominions to the inhabitants of the Low Countries, who had fled from the perſecution of the duke of Alva. Theſe people brought with them their arts and induſtry; they were allowed to ſettle in Norfolk, and each maſter to bring with him ten ſervants at the duke's charge. They rapidly increaſed, and the county was eſſen-

tially benefitted by their ſkill and exertions. New fabrications were introduced by the intermixture of ſilk, mohair, and wool; and ſeveral new articles were manufactured, as various in their qualities as their names; ſuch as bayes, ſayes, arras, and mochades. In 1575, the Dutch elders preſented in court a ſpecimen of a novel work, called bombazines, for the manufacturing of which elegant ſtuff this city has ever ſince been famed. In the reign of George I., an act was paſſed to compel the makers of any kind of ſtuff to become freemen of Norwich, as the manufacturers of ruſſels and fuſtians had formerly been. The preamble ſtates, that it was made to furniſh the city with a proper ſupply of able magiſtrates; but the policy of the meaſure lay deeper than the ſtatement. In the twenty-fifth year of George II., a ſtatute was enacted to open the port of Great Yarmouth, for the importation of wool and woollen yarn; a circumſtance which proved highly beneficial to the general trade of this city and county. From a ſtatement furniſhed by a maſter manufacturer in the year 1724, it appears that 120,000 perſons were then employed in the woollen, worſted, and ſilk manufactures. Not that the whole of theſe perſons reſided in the city, but they were employed in ſome branch of the trade, and their labours were conducive to the productions of Norwich.

The ſtaple articles of this manufacture, at preſent, are bombazines, worſted damaſks, flowered ſatins, and fine camblets; for the latter, the Eaſt India Company have given annually large orders, which has afforded ſome relief during the torpor of the trade to Italy and Spain. To theſe articles has been recently added the manufacturing of cottons, ſhawls, and other fancy goods, adapted both for furniture and dreſs, which for elegance, at preſent, ſurpaſs any thing of the kind made in England. The making of cotton thread-lace has alſo been introduced; and the trade in linen, called Suffolk hempen, is in a flouriſhing ſtate. The ſtaple manufacture of Norwich furniſhes about fifty diſtinct occupations, reckoning from the ſhearer who procures the fleece, to the mariner, who ſhips the bale goods; and when trade is very briſk it employs one hundred thouſand perſons. The Lincolnſhire and Leiceſterſhire wools are chiefly uſed, while thoſe of Norfolk are moſtly ſent for the uſe of the Yorkſhire clothiers. "The earnings of the manufacturers are various. Dyers and hot-preſſers earn about 15*s.* a week, combers about 12*s.*, ſome of the beſt weavers from 14*s.* to a guinea; weavers in general, on an average not more than 6*s.*, but then many women can earn as much, and children, by ſpinning, pipe-filling, and tyre-drawing, earn from 9*d.* to 2*s.* 6*d.* *per* week."

*Of the Churches, religious Houſes, and other eccleſiaſtical Subjects of the City.*—At an early period Norwich was diſtinguiſhed for its numerous monaſtic ſtructures. Herbert de Loſinga eſtabliſhed the ſee at Norwich in the year 1094, and laid the foundation ſtone of the cathedral in the year 1096. It has been ſaid, that "the firſt building was chiefly compoſed of wood;" but this is not very probable, as there can be no doubt that parts of it ſtill remain. How much was completed by Herbert is not clearly defined; though it is ſtated, that the choir, with its aiſles, alſo the tranſept and tower, were erected by him. To this Eborard, his ſucceſſor in the ſee, added the nave, with its two aiſles, extending from the antichoir, or rood-loft, to the weſt end.

Thus it ſtood, though not fitted up till 1171, when it was damaged by fire. John of Oxford, the fourth biſhop, repaired this injury, ſupplied the church with proper veſtments, and decorated it with ornaments, about the year 1197. Walter de Suffield, the tenth biſhop, made another addition, by erecting the Virgin chapel at the eaſt end, which has ſince been demoliſhed. In the year 1272, the cathedral was again injured by fire, but was repaired A.D. 1278. Soon after the tower, or the ſteeple, appearing to have been materially injured by the fire, it was taken down, and another erected at the ſole expence of biſhop Ralph de Walpole. The old chapter-houſe was built by the ſame bounteous prelate, who alſo erected that part of the cloiſter, which extends from the entrance of the chapter-houſe to the grand door-way into the church. Three more arches, on the ſame ſide, were executed by the clerk of the works, Richard de Uppehall. The remaining five arches, and the ſouth ſide of the cloiſter to the arch, where the eſpouſals was carved, were erected by biſhop Salmon, with the aſſiſtance of the monks; who, on this occaſion, ſuppreſſed the office of pittancer, and expended on the work the pittances of the convent. The north ſide, towards the church, was built by Henry de Well, who gave 210 marks himſelf, and obtained ſeveral donations to carry on the work. He was alſo allowed a portion of the pittance money. The weſt ſide, from the carving of the eſpouſals, the highly ornamented entrance towards the refectory, the lavatories, and the door-way into the pilgrims' hall, were built by Jeffery Simonds, the then rector of St. Mary-in-the-Marſh. The part extending from the pilgrims' hall door-way, to the entrance into the church incluſive, was the work of biſhop Wakeryng, who erected the new chapter-houſe, which was afterwards deſtroyed in the civil wars. In the year 1430, in the one hundred and thirty-third year from its commencement, this ſpacious, elegant, and juſtly celebrated cloiſter was finiſhed, in the preſidency of biſhop Alnwick, by whoſe executors the weſt end of the cathedral was rebuilt. In 1361, a hurricane blew down the upper part of the ſteeple, and at that time the preſent ſpire was built.

*Plan, Dimenſions, Diviſions, Architecture, &c. of the Cathedral.*—The architecture of this noble pile of building is chiefly of that ſtyle called Norman, wherein the ſemicircular arch, and large ſhort column, are the leading features. Theſe are conſiderably varied in ſize, mouldings, and ornaments, in different parts of the ſtructure. The plan diſplays a nave, with ſide aiſles, a tranſept, a choir, with ſemicircular eaſt end, and an aiſle ſurrounding it. Attached to, but projecting from this aiſle, near the eaſt end, is a ſmall chapel dedicated to Jeſus, and on the oppoſite ſide, at the ſouth-eaſt angle of the church, is another, called St. Luke's chapel. Weſt of this is a ſquare building, projecting from the aiſle, now uſed as the conſiſtory court. Between this and the tranſept is Heydon's chapel, and the old chapter-houſe. Abutting to the ſouth tranſept, are the precincts gaol or dungeon, and St. Edmund's, or the priors' chapel. Weſt of theſe, and attaching to the ſouth ſide of the nave, are the cloiſters. Such are the component parts of the cathedral, which joins to the biſhop's palace on the north ſide, and to the deanery, &c. on the ſouth. The following are given as the meaſurements: extreme length of the church, from eaſt to weſt, 411 feet, and of the nave, from weſtern door to tranſept, 140 feet. The extreme width of the latter is 191 feet, of nave, with aiſles, 72 feet. The cloiſters form a ſquare of 174 feet within the walls. They branch off from the ſouthern tranſept, and incloſe a ſquare court or area: eleven windows, or arched openings, are on the weſtern ſide, twelve on the oppoſite ſide, eleven to the north, and the ſame number on the ſouthern ſide. All theſe windows are divided into three lights, by two columns, and all are decorated with tracery; the latter preſents much variety and diſſimilarity. At the ſouth-weſt angle is a large lavatory. The roof is ſupported by groins, ſpringing from cluſtered columns, and ornamented with very bold boſſes at their points

points of interſection. The door-way leading from the eaſtern aiſle of the cloiſters to the nave is very curious. It is in the pointed arch ſtyle, with four columns on each ſide, having correſponding archivolt mouldings, in front of which are ſeven canopied niches, with richly ſculptured crockets, and each including a ſtatue.

The weſt front of the cathedral diſplays a large central compartment, fronting and correſponding with the width and height of the nave; alſo two lateral diviſions correſponding with the ſide aiſles. The elevation of the former ſhews a large central window, divided into three leading compartments in height, and the ſame number in width. Theſe are again ſubdivided by ſmall mullions, and the whole produces a highly ornamented effect. Beneath it is the grand entrance door-way, formed by a bold pointed arch, having its ſpandrils and ſide faſcia much enriched with mouldings, niches, pedeſtals, ſtatues, and other ſculptured decorations. The nave and aiſle on the ſouth ſide preſent five tiers or ſtories of windows and arcades, though part of the lowermoſt is obſcured by one ſide of the cloiſters. Above this is a ſeries of blank arches, or arcades, of the ſemicircular ſtyle, divided into fourteen compartments, by a flat buttreſs between each, and every diviſion conſiſts of ſix arches. In the next tier upwards, each compartment ſhews three ſemicircular arches, the central of which is opened and glazed, whilſt the other two are blank. Over this is a flatly pointed arch window, with two mullions in each diviſion. This conſtitutes the elevation of the aiſle, which is unuſually lofty and narrow. Above this is a ſeries of arches to the upper part of the nave, diſplaying in each compartment a pointed arched window in the middle, with a ſemicircular moulding over it, and two lateral blank arches. The ſides and front of the tranſept nearly correſpond, in the number and ſtyle of arches, with the diviſion juſt deſcribed. At the interſection of this tranſept, with the nave and choir, riſes a lofty tower, ſurmounted by a ſpire, the whole height of which is 315 feet. The former exhibits four ſtories, beſides that of the battlements; and each is covered with arcades, columns, and tracery mouldings, of very varied and curious workmanſhip. It is an intereſting ſpecimen of the Norman ſtyle of architecture, exemplifying it at that period, when the ſemicircular and interſecting arches with tall light columns were prevalent, and juſt before the pointed arch was generally adopted. The battlements and pinnacles at the angles are of a later ſtyle, as is the octangular ſpire, which has bold crockets attached to, and running up, the ribs at each angle. In the interior of the choir and its aiſles a very diſſimilar ſtyle of architecture is exhibited; for the former has large lofty windows, with pointed arches, ornamented with mullions and tracery, whilſt the latter diſplays ſeveral windows with ſquare heads, divided by three mullions and tracery. Theſe windows are curious and rare examples of form. Bold buttreſſes project from the upper part of the choir, acroſs and over the aiſle. Of the interior it muſt ſuffice to remark, that it is grand and ſolemn in the general effect; that the piers, columns, arches, and mouldings, are in a bold and ſubſtantial ſtyle. It is much to be regretted by every architect, antiquary, and man of taſte, that the modern fittings up of the choir, pewing in the aiſle, encumbered ſtate of the tranſepts, &c. tend to diſfigure the building, and deſtroy all harmony, propriety, character, and beauty. The preſent choir, or part appropriated for cathedral ſervice, is made to extend from the ſemicircular eaſt end acroſs the tranſept, and to the third column in the nave. This ſpace is nearly encloſed with boarded and painted partitions, filling up the arches, and ſhutting out the ſight from all general and comprehenſive views of the building.

*Tombs, &c.*—The cathedral contains various ſepulchral memorials. The tomb of biſhop Herbert, the founder, was deſtroyed in the time of the civil war; and a new altar monument was erected to his memory by the dean and chapter in the year 1682. It ſtands in the central part of the choir, incloſed with an iron paliſade. This part of the church contains alſo the graves of moſt of the prelates who have filled the ſee; but few intereſting monuments now remain. There are mural ſtones to the memory of biſhops Scambler and Overall. Between the ninth and tenth pillars, reckoning from the weſt, was a chapel, now thrown open, where is an altar-tomb, deprived of its braſſes, under which was interred ſir James Hobart, who was attorney-general to king Henry VII. Till the reformation this chapel was the chantry, belonging to the Hobart family. In Jeſus chapel ſtands a tomb, removed from the chapel of the Virgin Mary, erected to the memory of ſir Thomas Wyndham, who was knighted by ſir Edward Howard, in the fourth year of king Henry VIII.; he died at his ſeat at Felbrigge, October 22, 1521. Among other celebrated perſons, whoſe place of ſepulture is in this church, may be noticed John Heydon, eſq. a great favourite of Edward IV.; ſir Henry Heydon, knt., who built at his own expence Salthouſe church; ſir William Boleyn, great grandfather to queen Elizabeth; ſir Roger Bigod, knt. ſewer to king Henry I.; ſir Walter de Berney, Calthorp, Boſvill, Baconthorpe, &c. In the chapel called our Lady the Leſs, is an arched mural monument to ſir William Beauchamp, the founder, who lived in the reigns of Edward I. and Edward II.

The biſhops palace, on the north ſide of the collegiate precinct, is not the one built by the founder of the cathedral, though it ſtands upon the ſame ſcite. The original building was pulled down, and a larger ſtructure erected by biſhop Salmon, in the year 1318; in the rebellion it partook of the general injuries which were committed on eccleſiaſtical buildings by the fanatic ſpirit of the times. The greater part was let out in tenements, and the grand hall converted into a meeting-houſe. Jeſus chapel, in the cathedral, was originally appropriated to the uſe of the prelate; but being found inconvenient, biſhop Salmon erected another near the palace. In this, which was one hundred and thirty feet long by thirty broad, were buried the founder, and ſeveral other prelates. In 1619, it was licenſed for the Walloon congregation. During the rebellion it was greatly injured, and its fine painted windows mutilated.

*A Liſt of the Biſhops of Norwich.*—1. Herbert Loſinga, having removed the ſee from Thetford, held it till his death, in 1119.

2. Eborard, or Everard, after a vacancy of nearly three years, was advanced to the prelacy in 1121. He retired in 1146, and was ſucceeded by

3. William Turbus, on whoſe death, in 1175,

4. John of Oxford, dean of Saliſbury, was elected. He died in 1200, when

5. John de Grey was promoted to the ſee. He died at Poictou in 1214. The biſhopric was then vacant above ſeven years, and was conferred, in 1222, on

6. Pandulphus, the pope's legate. On his death,

7. Thomas de Blandeville was conſecrated in 1226; dying in 1236.

8. Ralfo was elected in his ſtead; and died the following year.

9. William de Raleigh, after a conteſt of three years, obtained the ſee in 1240. On his tranſlation to Wincheſter, in 1244,

10. Walter de Suffield, or Suthfield, was elected: he died in 1257, and was ſucceeded by

11. Simon

11. Simon de Waltone, who died in 1265; when,

12. Roger de Skerewing was conſecrated; he held the ſee thirteen years: on his death

13. William Middleton, archdeacon of Canterbury, ſucceeded in 1278. He died in 1288, when

14. Ralph de Walpole, archdeacon of Ely, was elected. Being tranſlated to the ſee of Ely in 1299, his place was ſupplied by

15. John Salomon, or Salmon, who enjoyed the biſhopric twenty-ſix years, and died in 1325.

16. Robert de Baldok was elected to ſucceed him, but out of ſubmiſſion he reſigned in the ſame year.

17. William de Ayrminne was conſecrated in 1325, and died in 1336.

18. Thomas Hemenhall was elected in 1337, but being in the ſame year removed to the ſee of Worceſter,

19. Anthony de Beck was appointed biſhop by the pope's mandate: he died in 1343, and was ſucceeded by

20. William Bateman, dean of Lincoln, who founded Trinity-hall, Cambridge, for the expreſs purpoſe of ſupplying his dioceſe with a ſucceſſion of qualified paſtors. He died at Avignon in 1354.

21. Thomas Percy, brother to the earl of Northumberland, ſucceeded by papal authority, though but twenty-two years of age. On his death, which took place in 1369,

22. Henry Spencer was conſecrated by the pope in perſon. This prelate was the firſt who quartered the epiſcopal arms with his own. He died in 1406.

23. Alexander de Tottington, prior of Norwich, was promoted to the ſee on the death of Spencer, and held it till 1413; when, on his death,

24. Richard de Courteney, chancellor of Oxford, was elected; but died within two years.

25. John Wakeryng, archdeacon of Canterbury, was elected in 1416; and died in 1425.

26. William Alnwick, archdeacon of Saliſbury, ſucceeded, by papal mandate, in 1426. He was tranſlated to Lincoln in 1436, when

27. Thomas Brown, or Breus, biſhop of Rocheſter, was tranſlated to Norwich by a bull of pope Eugenius IV. He died in 1445, when John Stanberry, a Carmelite friar, was elected but never conſecrated, through the interference of the pope.

28. Walter Hart, or Lyhart, maſter of Oriel college, Oxford, was then appointed by papal mandate. He held the ſee twenty-ſeven years, and died in 1472.

29. James Goldwell, the pope's prothonotary, was conſecrated at Rome by pope Sixtus IV. in 1472. On his death, in 1498, Chriſtopher Urſwyke was elected, but on his refuſal of the honour,

30. Thomas Jane, archdeacon of Eſſex, was conſecrated in 1499, but died the next year.

31. Richard Nykke, archdeacon of Exeter, ſucceeded, and having filled the epiſcopal chair thirty-five years, died in 1535.

32. William Rugg, or Reppes, abbot of St. Bennet's in Holme, was advanced to the biſhopric by Henry VIII. for his aſſiſtance in forwarding the king's divorce. He died in 1550, when

33. Thomas Thirlby, the firſt and laſt biſhop of Weſtminſter, was promoted to the ſee of Norwich, whence he was tranſlated to that of Ely, in 1554.

34. John Hopton, prior of the Dominican monaſtery, ſucceeded; and died in 1559, when

35. Richard Coxe, who in the following year was tranſlated to Ely by queen Elizabeth, who nominated in his ſtead

36. John Parkhurſt, who was conſecrated Sept. 1, 1560, and died Feb. 2, 1574.

37. Edmund Freke, biſhop of Rocheſter, was tranſlated to Norwich, July 13, 1575, and hence to Worceſter, December 1584, when

38. Edward Scambler, biſhop of Peterborough, ſucceeded. He died May 7, 1594.

39. William Redman, archdeacon of Canterbury, was elected December 1594, and died September 25, 1602.

40. John Jeggon, dean of Norwich, was advanced to the biſhopric February 20, 1603, and died March 13, 1617.

41. John Overall, biſhop of Lichfield and Coventry, was tranſlated to the ſee of Norwich, May 21, 1618, but held it only one year. On his death

42. Samuel Harſnett, biſhop of Chicheſter, was tranſlated to this ſee; whence he was preferred to the archbiſhopric of York, November 6, 1627, and was ſucceeded here by

43. Francis White, biſhop of Carliſle, who was tranſlated hence to the ſee of Ely, December 8, 1631, when

44. Richard Corbett, biſhop of Oxford, was promoted to Norwich, where he died July 28, 1635.

45. Matthew Wren, biſhop of Hereford, and father of that eminent architect ſir Chriſtopher Wren, was tranſlated to this ſee November 16, 1635, and was removed to that of Ely, April 1638.

46. Richard Montague, biſhop of Chicheſter, was tranſlated to Norwich, May 4, 1638, and died April 1641.

47. Joſeph Hall, biſhop of Exeter, was tranſlated to this ſee November 1641; but was deprived of his rights by the uſurped authority of the houſe of commons.

48. Edward Reynolds was conſecrated January 6, 1660, and died July 28, 1676.

49. Anthony Sparrow, biſhop of Exeter, was tranſlated hither Auguſt 28, 1676. He died May 19, 1685.

50. William Lloyd, biſhop of Peterborough, was promoted to Norwich June 11, 1685; but, on the acceſſion of king William, refuſing to take the oath of abjuration, he was deprived of his biſhopric. In his ſtead

51. John Moore was elected May 21, 1691, and having held the ſee ſixteen years, was tranſlated to that of Ely. He was the moſt celebrated collector of ſcarce and valuable books in England. On his deceaſe, George I. purchaſed his immenſe library, and preſented it to the univerſity of Cambridge.

52. Charles Trimnel, archdeacon of Norwich, was conſecrated biſhop February 8, 1707, and was tranſlated to Wincheſter in 1721; on which

53. Thomas Green, archdeacon of Canterbury, was advanced to this ſee; whence he was removed to that of Ely, September 4, 1723.

54. John Long, chaplain to George I., was promoted to this biſhopric October 2, 1723, and died October 26, 1727.

55. William Baker was tranſlated from the ſee of Bangor to Norwich, in 1727. He died December 4, 1732. He was ſucceeded by

56. Robert Butts, dean of Norwich, who was conſecrated biſhop January 25, 1733, and was tranſlated to Ely in 1738, when

57. Thomas Gooch, biſhop of Briſtol, was removed hither. In 1748 he alſo was tranſlated to the ſee of Ely, and was ſucceeded here by

58. Samuel Liſle, biſhop of St. Aſaph, who held this ſee only one year.

59. Thomas

the duke for the city workhouſe; but ſince the poor-houſe in St. Andrew's pariſh was enlarged, the whole ſcite has been ſold, and built on by different proprietors. Fuller ſays this palace was the largeſt he had ever ſeen out of London. Among its various accommodations for amuſement, were a theatre, tennis-court, and bowling-alley. The latter was the firſt of the kind in England, and when Thomas, duke of Norfolk, was accuſed of aſpiring to the throne of Scotland, by his intended marriage with Mary, queen of Scots, he proteſted to Elizabeth, that when in his bowling-alley at Norwich, he conſidered himſelf equal to a king of Scotland. On the north ſide of Newgate ſtands Surry houſe, a curious ſpecimen of domeſtic architecture; in the windows of which were emblazoned, on glaſs, many armorial bearings.

Among the more eminent natives of this city, are William Bateman, better known in records by the name of William de Norwico, from the place of his birth. He was ſon of William Bateman, who ſerved the office of bailiff, and in 1326 repreſented the city in parliament. Mathew Parker a pious and learned divine, and archbiſhop of Canterbury in the time of queen Elizabeth, was born in the pariſh of St. Saviour, in this city, Auguſt 6, 1504. John Kaye, better known by his latinized name of Caius, an eminent phyſician in the reigns of queens Mary and Elizabeth, was born at Norwich in the year 1510. Edward Browne, a diſtinguiſhed phyſician in the reign of Charles II., the eminent ſon of an eminent father, ſir Edward Browne, was born in this city about the year 1642. Dr. Samuel Clarke, a learned and polemical divine, who was diſtinguiſhed in the latter part of the ſeventeenth, and beginning of the eighteenth century, was the ſon of Edward Clarke, eſq. who was alderman of Norwich, and for ſeveral years one of its repreſentatives in parliament. He was born October 11, 1675. William Cuningham, a phyſician of Norwich, was born in the year 1531. Thomas Legge, antiquary, born in 1535. John Coſin, biſhop of Durham, the eldeſt ſon of Giles Coſin, a citizen of Norwich, was born November 30, 1594. Edward King, F.R.S. and F.S.A. deſcended from a Norfolk family of high reſpectability, was born at Norwich 1734. He died in London April 16, 1807. Annals of Norwich, in Watſon's Anglia Sacra, a complete hiſtory of the famous city of Norwich, 8vo. 1728. A hiſtory of this city forms two volumes of Blomefield's collection, for the county of Norfolk. Beauties of England, vol. xi. 1809, by J. Britton, F.S.A.

Norwich, a conſiderable townſhip in Windſor county, Vermont, on the W. ſide of Connecticut river, oppoſite to Dartmouth college; containing 1486 inhabitants.—Alſo, a townſhip in Hampſhire county, Maſſachuſetts, 14 miles S.W. of Northampton; incorporated in 1773, and containing 959 inhabitants.—Alſo, a city and poſt-town of Connecticut, and of the ſecond rank in New London county, ſituated at the head of Navigation or Thames river, 14 miles N. of New London. This is a convenient city, and has an extenſive and rich back country; and being ſituated on a navigable river, has convenient ſeats for mills and water machines of all kinds. The inhabitants manufacture paper of many kinds, ſtockings, clocks and watches, chaiſes, buttons, ſtone and earthen ware, oil, chocolate, wire, bells, anchors, and all ſorts of forge-work. It contains about 500 dwelling-houſes, a court-houſe, two churches for Congregationaliſts, and one for Epiſcopalians, and 3476 inhabitants. The town conſiſts of three diviſions, *viz.* Chelſea at the landing, the Town, and Bean hill, in which latter diviſion is an academy, and in the town is an endowed ſchool. The courts of law are held alternately at New London and Norwich. This town was ſettled in 1660, by 35 perſons, principally from Saybrook; 251 miles N.E. of Philadelphia. N. lat. 41° 34'. W. long. 72° 29'.—Alſo, a townſhip in Chenango county, New York, incorporated in 1793, ſettled principally by people from Connecticut, bounded ſoutherly by Oxford, lying 55 miles W. of Cherry valley, and containing 2219 inhabitants.—Alſo, a place now called "Whitby," in Upper Canada, on the N. ſhore of lake Ontario.—Alſo, a townſhip in Norfolk county, Upper Canada, E. of and adjoining Dereham.

NOSAG, a town of Bengal; 20 miles S.S.E. of Palamow.

NOSAPOUR, a town of Hindooſtan, in the circar of Hindia; 10 miles N.E. of Hurdah.

NOSCHALSKOI, a town of Ruſſia, in the province of Uſting; 68 miles S.E. of Lalſk.

NOSE, in *Anatomy* and *Phyſiology*, the organ of the ſenſe of ſmelling.

The noſe conſiſts of two large cavities, called noſtrils (nares), a right and left, formed by the bones of the face, extending from before backwards, placed between the two orbits above, and immediately over the palate below, and ſeparated from each other by a perpendicular flat partition, called the ſeptum narium.

The noſtrils, of which the right and left are perfectly alike, are ſurmounted in front by a pyramidal organ, compoſed of cartilage, and called in common language the noſe. At the baſis of this are two openings, leading into the noſtrils. Theſe cavities terminate behind, by two much larger apertures, in the upper and front part of the pharynx.

The bones compoſing the noſe are deſcribed individually in the article Cranium, which contains alſo a general account of the cavities reſulting from their union. The bony hollows are lined by a vaſcular membrane, called the pituitary or Schneiderian, on which are diſtributed the olfactory nerves, the immediate ſeat of the ſenſe.

As the noſtrils are open in front to the external air, and behind to the pharynx, on the ſurface of which the entrance of the air into the trachea (rima glottidis) is found, they ſerve, as well as the mouth, for the paſſage of the atmoſphere in reſpiration to and from the lungs. Odours diſſeminated in the air are thus brought in contact with the pituitary membrane, and impreſs the olfactory nerves in that membrane.

In the detailed deſcription of the apparatus of the ſenſe of ſmelling, we ſhall notice, 1, the external organ; 2, the general poſition, figure, and dimenſions of the noſtrils or internal cavities; 3, the communications of the latter with the pharynx; 4, the membrane lining them and its nerves; 5, the developement of the noſe; 6, the phyſiology of ſmelling.

I. The noſe, which covers and completes the organ of ſmelling towards the front, occupies the middle and upper part of the face, bounded above by the forehead, below by the upper lip, and on the ſides by the orbits and cheeks. The ſize and form are ſubject to numerous varieties; but the latter is moſt commonly that of a triangular pyramid, with its baſis downwards, its apex upwards; a poſterior ſurface confounded with the noſtrils, and two lateral ones. Each of the latter is ſeparated from the cheek behind by a ſemicircular groove, which then advances a ſhort way upon the lateral ſurface. The two lateral planes meet together in front in a ridge of various breadth, directed obliquely from above forwards and downwards, and called in Latin dorſum naſi (dos du nez). This ridge ends below in a prominence conſtituting the tip of the noſe (le lobe).

The baſis of the noſe preſents two oval openings, ſeparated

rated by a partition continuous with that which divides the noſtrils. Their outer ſides are moveable, and are called the alæ naſi. The openings are always patulous, and thus afford a conſtant paſſage to the air in reſpiration; the cartilaginous nature of their ſides provides for this circumſtance.

The top of the noſe is continuous with the forehead and eyebrows; behind, it is joined in the middle by the ſeptum of the noſtrils, and it is continucd on the ſides with the cheeks.

The noſe is covered in front by a double layer of muſcle and ſkin, and lined internally by a mucous membrane. But the eſſential part of the organ is a bony arch above, formed by the two oſſa naſi, and, below this, membranous fibro-cartilages. Hence it is ſolid and capable of great reſiſtance at the upper part, ſo as to protect the correſponding portion of the noſtrils, the immediate ſeat of ſmelling made up of the thin brittle plates of the ethmoid, from external injury; comparatively weak, and ſuſceptible of motion below, ſo that the openings may be expanded, contracted, or even entirely cloſed. The middle, although compoſed of cartilage, does not move; the dimenſions of the openings are altered by movements of the ſides or alæ naſi.

*Cartilages of the Noſe.*—The moſt conſiderable of theſe is a piece which forms the ſides of the anterior opening, and is called by Bichat fibro-cartilage des ouvertures naſales. Its figure is curved, as it conſiſts of two portions or branches united in front at an obtuſe angle at the tip of the noſe. The external branch correſponds to the alæ naſi, and extends upwards and backwards to terminate in a point; it is covered by the compreſſor muſcle, and by the ſkin on one ſide; by the mucous membrane on the other. The inner branch lies along the ſide and front edge of the ſeptum, and contributes greatly, with the correſponding one of the oppoſite ſide, to the thickneſs of this part of the noſe. It is broad in front, and terminates in a point behind. One ſurface of it is contiguous to the ſeptum; the other is covered by the ſkin, and the commencement of the mucous membranc. The union of theſe two branches forms a prominence at the point of the noſe, of which the convexity is very variable. There is generally a ſlight groove, which is ſometimes hardly apparent, ſeparating this from the correſponding part of the oppoſite ſide.

Another ſmall piece is placed at the lower and back part of the alæ naſi, where it is continuous with the cheek; it is merely a flat portion of irregular figure, ſurrounded on every ſide by a kind of fibrous membrane, which unites it to the outer branch of the former, to the cartilage of the ſeptum, and to the naſal proceſs of the ſuperior maxillary bone. This is placed between the ſkin and the mucous membrane.

The parts juſt deſcribed are of the fibro-cartilaginous texture; they retain their form, when no force is applied to them; ſo as to leave the noſtrils free for the purpoſe of reſpiration; but they yield eaſily to the muſcles connected with them.

The middle of the noſe is formed by a piece of true cartilage, poſſeſſing greater firmneſs than the parts juſt deſcribed. It is called the cartilage of the ſeptum, and by Bichat cartilage naſal. It is made up of three portions; two exterior and anterior, forming the ſides of the upper part of the noſe, and one poſterior and middle completing the ſeptum narium. Theſe three portions are united in front, at the dorſum of the noſe, at an acute angle. They are deſcribed diſtinctly by moſt authors, under the names of cartilage of the ſeptum, and lateral cartilages.

The middle and poſterior is the moſt conſiderable portion, and belongs to the internal cavities, as well as to the external organ. It is a broad flat piece ſituated on the middle line of the noſe, and has a trianguiar figure. Its direction is ſometimes perpendicular; ſometimes it deviates towards one ſide or the other; in the former caſe, its lateral ſurfaces are plane, in the latter convex and concave. Theſe have ſeveral inequalities and pores, to which the membrane of the noſe adheres very cloſely. The upper edge has an oblique direction, backwards and downwards; it is irregular, and either encloſed between two plates of the perpendicular lamina of the ethmoid, or, if that be ſingle, ſimply continuous with it. The inferior margin is received behind betwcen two plates of the lower, and is here rather oblique in the direction forwards and downwards; in front it is rounded, not adherent to any part, but placed between the internal branches of the right and left fibro-cartilages of the openings of the noſe, and concurring with them to form the partition between thoſe openings. The anterior edge forms the middle of the back of the noſe; it is thick above, where it is ſubcutaneous and prominent, thin below, where it is entirely concealed by the internal branches of the fibro-cartilages of the naſal openings, between which it ends in an obtuſe angle, formed by its union with the inferior margin, and correſponding to the tip of the noſe.

This portion of the cartilage is porous and unequal on the ſurface; leſs flexible than the pieces deſcribed previouſly, and breaking much more readily when bent. Its ſtructure, in ſhort, is more perfectly cartilaginous, and gives it ſolidity correſponding to its functions, in which there is no motion.

The upper half of the anterior edge of the part juſt deſcribed gives origin to the lateral portion on each ſide. This is continuous with the middle piece at this part, but ſeparated from it below by a cellular interval. Its form is triangular, and ſize variable; and it is directed obliquely along the ſide of the noſe. Above, it is connected to the os naſi and ſuperior maxillary bone by ſhort ligamentous fibres; below, by a looſe ligamentous tiſſue, to the external branch of the fibro-cartilage of the naſal opening. The external ſurface is convex, and covered by the compreſſor and ſkin; the internal is concave, and lined by the pituitary membrane. It is thin, and therefore has ſome flexibility, but its motions are always inconſiderable. When the openings of the noſe are dilated, the ala is the part that moves chiefly.

The cartilages juſt deſcribed are connected to each other, and to the edges of the bony opening by a thin, but tolerably firm fibrous membrane; to the inſide of which the pituitary adheres very cloſely. They vary very much in ſize and figure, and hence ariſe numerous differences in the outward appearance of the organ in different individuals. Theſe variations are of no importance anatomically ſpeaking. The bony part of the noſe is conſtituted by the oſſa naſi and the naſal proceſſes of the ſuperior maxillary bones. Theſe are united above to the frontal bone, and form a ſtrong arch, by which the interior of the organ is protected.

The naſal fibro-cartilages give inſertion to various muſcles, which form a ſtratum covering them under the ſkin. Theſe are the Epicranius, Compressor *narium*, Depressor *alæ naſi*, Nasalis *labii ſuperioris* (ſee thoſe words), and the *levator labii ſuperioris* and *alæ naſi*, (ſee Deglutition.) The motions of the cartilages have reference to two effects, *viz.* the dilatation and contraction of the openings. In the former the alæ are drawn upwards and outwards, ſo as to enlarge the aperture laterally; we obſerve this motion in a perſon breathing very laborioufly, and in ſome paſſions of the mind. The ala is drawn downwards, and applied againſt the ſeptum, when the opening is cloſed; this is a motion not very frequently performed.

The ſkin of the noſe is looſely connected to the ſubjacent parts above, and more firmly below. It is remarkable in

the latter ſituation for poſſeſſing a conſiderable number of ſebaceous glands, the ducts of which appear on the ſurface, when the cuticle has been removed, in the form of numerous pores. Their contents may be ſqueezed out after death in ſlender white threads.

The organ is covered internally by a mucous lining, which forms the tranſition from the common integuments to the pituitary membrane. It is ſoft and vaſcular, has a very diſtinct cuticle, and numerous ſtrong hairs, which are ſometimes long enough to project at the opening.

II. *Cavities of the Noſtrils.*—For their general figure, the bones compoſing them, &c. ſee CRANIUM.

The noſtrils are ſeparated from the cranium by the cribriform plate of the ethmoid; the palatine portions of the ſuperior maxillary and palate bones form the inferior boundary, by which they are parted from the mouth. The orbital ſurface of the ethmoid and the os unguis cloſe them towards the orbit; and they extend laterally to the projection of the cheek, under the eyes, if we include the maxillary ſinuſes.

Their direction is nearly horizontal, from the openings by which they commence in the face, to their termination in the pharynx: at the back part, however, they ſlope a little downwards, principally on account of the inclined ſurface of the body of the ſphenoid. The inferior boundary, compoſed of the bony palate, is ſtraight and horizontal. The ſuperior is curved from before backwards, and compoſed in front of the oſſa naſi, in the middle, of the cribriform plate of the ethmoid, and behind, of the body of the ſphenoid. The oſſa naſi ſlant downwards and forwards from the front of the ethmoid, and the ſphenoid downwards and backwards from the back of the ſame bone. Hence the perpendicular meaſurement of the noſtril is greateſt in the middle, from the ethmoid to the ſuperior maxillary bone, and it gradually decreaſes from this point towards the front and back openings. The antero-poſterior diameter is the moſt conſiderable; the longeſt meaſure of this is in the middle; it diminiſhes upwards on account of the curved figure of the roof of the noſe, and it alſo diminiſhes downwards, but not ſo much.

The tranſverſe meaſurement is greateſt below, and becomes ſmaller as we aſcend: the ſuperior concha is very nearly in contact with the ſeptum. Indeed, that the tranſverſe diameter of the noſe is on the whole inconſiderable, muſt be apparent from the fact, that the ſwelling of the membrane in cold very often entirely obſtructs the paſſage of air through it.

III. The opening of the noſtrils behind into the pharynx is placed immediately under the baſis cranii, and over the velum palati. There are two nearly oval apertures, about an inch in length, by half an inch wide, ſeparated by the poſterior edge of the vomer. The body of the ſphenoid above, its internal pterygoid plates at the ſides, and the back edge of the oſſa palati below, form theſe openings, which muſt be inſuſceptible of change in their dimenſions, as all theſe parts are fixed. The velum palati may be drawn up, ſo as to cloſe theſe apertures, and prevent the air from paſſing through the noſe in breathing, or to prevent the food in deglutition, or the contents of the ſtomach in vomiting, from being admitted into the noſtrils. See DEGLUTITION.

IV. The cavities of the noſe are lined throughout by a mucous membrane, which conſtitutes the eſſential organ of ſmelling. It is extended over all the eminences of the noſtrils, and enters all the cavities. In front it is continuous with the ſkin, and behind with the mucous ſurface of the pharynx.

If we begin to trace it from the floor of the noſe, we ſee it aſcending along the ſeptum to the roof of the cavity, forming no fold in its courſe, and eaſily detached from the bone and cartilage that compoſe the ſeptum. It is continued on the under ſurface of the cribriform plate, of which it cloſes the foramina: in front it paſſes to the back of the oſſa naſi, and behind to the under ſurface of the ſphenoid, entering and lining the cells of that bone, ſometimes contracting their orifice, ſometimes leaving it as wide as in the ſkeleton.

The pituitary membrane is then continued over the external ſurface of the noſtril, firſt covering the flat plate of the ethmoid and the ſuperior concha, and then reflected at the convex edge of the latter, to enter the ſuperior meatus. The fold is looſe, and deſcends rather lower than the edge of the concha, ſo as to contract the entrance of the meatus: behind it is continued towards the pharynx, beyond the poſterior end of the concha. Here it cloſes the ſphenopalatine foramen, through which the pituitary receives veſſels and nerves. The membrane lines the poſterior ethmoid cells, then covers the middle concha, is reflected at its inferior edge, and thus enters the middle meatus, which it lines. It is prolonged through an opening, generally very narrow, into the maxillary ſinus, which it lines. The entry to the ſinus is near the front of the meatus; and the aperture leads into the upper and anterior part of the cavity. After removing the middle concha, a bony plate is expoſed, covered by the pituitary membrane, and terminating above by an unattached edge: this plate conceals the narrow entrance of the ſinus. The large opening of this cavity in the ſeparate maxillary bone is diminiſhed by the appoſition of the ſurrounding bones; but it is ſtill farther contracted by the membrane, of which there are two layers at this part; one belonging to the noſe, the other to the ſinus. Above the entrance of the maxillary ſinus there is an aperture, by which the membrane paſſes into the anterior ethmoidal cells and the frontal ſinus, without forming any fold.

From the middle meatus the membrane is continued over the inferior concha, forming a very thick and large fold at its margin, by which the apparent depth of the concha is much increaſed. At the edge of the inferior concha the membrane paſſes into the inferior meatus, lines it, is continued with the mucous lining of the ductus naſalis, and then paſſes to the floor of the noſe, from which part we firſt traced it.

In front the pituitary membrane lines the cartilages of the noſe: behind it goes out at the poſterior naſal apertures to join the membrane of the pharynx, paſſing above under the body of the ſphenoid, below over the velum palati. At the back edge of the ſeptum, the membranes of the two noſtrils are continuous with each other. Towards the outſide of the opening it forms a more or leſs diſtinct perpendicular fold; behind which, juſt where the noſe and pharynx join, it covers the cartilage of the Euſtachian tube, forming above it a deep cul de ſac.

The pituitary or Schneiderian is analogous to other mucous membranes in the fluid, which it produces, but differs from them in its thickneſs, which is much more conſiderable. Its colour is generally very red; but this differs in different parts and ſubjects. A fibrous layer, which is only the perioſteum or perichondrium of the naſal cavities, is joined to a mucous ſtratum, in order to form the pituitary membrane, which muſt conſequently be claſſed among the fibro-mucous organs. This ſtructure may be very eaſily ſhewn by breaking the ſeptum, and removing the fragments; the fibrous portion is not injured, becauſe it adheres leſs firmly

to

to the bone than to the mucous ſurface, while the perioſteum in other ſituations is much more cloſely attached to the bone than to the ſurrounding parts. When the pituitary is thus ſeparated, it forms a very thick membrane, whitiſh, denſe, and ſtrong on the ſurface next to the bone; ſpongy, ſoft, and red towards the noſe. Yet, though the external appearance and nature of the two laminæ are ſo different, they are inſeparably connected together. The mucous layer is compoſed of a well defined corion, to which its thickneſs is owing. Its ſpongy texture is obſervable, particularly about the conchæ, and more eſpecially at their edge. Many anatomiſts have ſuppoſed that mucous glands exiſt in this membrane; but we cannot demonſtrate them. However, numerous ſmall pores and cavities are obſervable on many parts of its ſurface, which may be conſidered as mucous lacunæ. There are no papillæ on it. The capillaries are very numerous and ſuperficial, and often bleed from very ſlight accidents: fine injections penetrate through the membrane in every direction, and give a general deep red colour.

In the proper cavity of the noſtril, the pituitary membrane has throughout nearly an uniform ſtructure; but its appearance is very different in the ſinuſes. It is thin, not ſpongy, but ſmooth on the ſurface, eaſily detached from the bone, and poſſeſſing a much ſmaller ſhare of capillaries, except when it is inflamed.

The ſoft ſurface of the pituitary membrane is every where covered by a mucous fluid, either ſecreted by glands, if ſuch exiſt, or furniſhed by the exhalant arteries of the part. This fluid is thick, tenacious, and whitiſh, and more abundant in the cavities of the noſtrils than in the ſinuſes. The paſſage of the air dries it, and converts it into a hard cruſt of different appearances. In that affection of the noſe, which conſtitutes a cold, this mucous fluid is poured out in increaſed quantity, firſt tranſparent and thin, afterwards thick, tenacious, and white, or yellow. The naſal mucus, under ordinary circumſtances, is probably, in part, evaporated by the conſtant current of air in breathing to and from the lungs: it is partly expelled by the ſtrong current of air directed through the noſtrils in the act of blowing the noſe, and probably flows through the back openings into the pharynx. The latter is the courſe which it takes in the act of hawking: by drawing the air into the lungs entirely by the noſtrils, the mucus is forced from thoſe cavities into the pharynx, and expelled from it again by the mouth.

The openings of the frontal and ethmoid ſinuſes are ſo diſpoſed, that the mucus poured out in them will by its gravity paſs into the noſe: but this is not the caſe with the ſphenoid or ſuperior maxillary cavities. The mucus may run out of the latter, when the head lies on its ſide, but we do not ſee how it can be evacuated in the erect poſition.

It is, perhaps, hardly neceſſary to notice here the erroneous notion, which for ſo long a time prevailed univerſally in phyſiology and pathology, and which is generally entertained to this day by thoſe who are ignorant of anatomy, that the naſal mucus comes from the head, that it is a kind of excrement of the brain diſtilling through the foramina of the ethmoid. When we ſee an opinion, which an eaſy anatomical labour would have deſtroyed, univerſally maintained for centuries, we may conclude with certainty that the opportunities of reſearch were extremely limited, and that the anatomical works of the ancients muſt be completely deſtitute of information for us. Even Veſalius adopted the general error, which was not clearly refuted until after the middle of the 17th century, when C. V. Schneider publiſhed his work De Catarrhis, and ſhewed that there is no connection between the brain and noſe, that the dura mater covers the cribriform plate above, and a peculiar membrane below, and that the latter, extended over the whole naſal cavity, is the ſource of the fluid generated in catarrh.

In conſidering the action of the air on the pituitary membrane and its ſecretions, we muſt bear in mind that that portion which is ſent from the lungs is moiſt air; that it is loaded with the watery vapour formed in the proceſs of reſpiration.

The *nerves* of the pituitary membrane are derived from different ſources. The origin of the olfactory, and its courſe to the ſuperior ſurface of the cribriform plate, are deſcribed in the article NERVOUS *Syſtem*. From the ſoft ganglion which it forms in the cranium numerous branches ariſe, and paſs through the holes of the cribriform plate. They acquire a firm covering in this paſſage, ſo that they are as hard on the outſide of the cranium as any other nerves. They paſs through the bony canals of different lengths, which are continued from the foramina juſt mentioned. The filaments, which penetrate the internal ſeries of holes, are expanded on the anterior and middle portion of the ſeptum narium: they divide into branches, which again ramify, and are ſometimes united by communications: they are ſo involved in the texture of the membrane, that they can hardly be traced below its middle. The outer ſeries of twigs is expanded in a ſimilar way on the ſuperior and middle turbinated bones, but cannot be traced beyond the convex edge of the latter. They are ſpent on that ſurface of theſe bones, which forms a part of the cavity of the noſtril, and not on that which is concerned in forming the ethmoid cells.

The lower and poſterior part of the ſeptum, and the inferior concha, receive branches from the ſuperior maxillary nerve. The naſal branch of the ophthalmic nerve is loſt upon the front of the ſeptum, and the tip of the noſe. See the deſcription of the ramifications of the nerves. For excellent deſcriptions and repreſentations of the naſal nerves, ſee J. Hunter on the Animal Economy, and Scarpa Annot. Academ. lib. ii., particularly the latter. The pituitary membrane poſſeſſes two kinds of ſenſibility, correſponding to the two kinds of nerves diſtributed on it. The firſt is that peculiar ſpecies, by which it is enabled to perceive odours: it reſides in the olfactory nerves. The ſecond is common ſenſation, or the power of receiving thoſe general impreſſions which affect all organs poſſeſſing ſenſibility, and which, in this caſe, is exerciſed by the branches of the nerves of the fifth pair. That theſe properties are in ſome degree independent, is rendered obvious by the phenomena of diſeaſe. A tumour preſſing on the olfactory nerve, or any local diſeaſe affecting the ſame nerve, deſtroys the ſenſe of ſmelling; which ceaſes alſo in the inflammation accompanying a common cold: yet in both theſe inſtances, the common ſenſation of the part continues; and a foreign body, introduced into the cavity, will produce the ſame inſupportable tickling as in a perfectly healthy ſubject.

The pituitary membrane has very cloſe ſympathetic connections with other parts. Irritation of it by ſtimulating powders, acrid fumes, even by its own ſecretion in increaſed quantity, &c. will cauſe a flow of tears, and excite that convulſive action of the reſpiratory muſcles, called ſneezing. (See LUNGS.) Certain odours excite nauſea, and even ſickneſs; and ſome cauſe fainting. It has been aſſerted, that the impulſe on the retina, when a perſon comes ſuddenly from a dark place into a bright light, will cauſe ſneezing. The brain is moſt readily excited in ſyncope, by applications to the noſe. This is a fact univerſally known, ſo that burnt feathers, ammoniacal ſubſtances, &c. are immediately applied to the noſe of a perſon diſpoſed to faint. It will be

obſerved, that in almoſt all theſe caſes, an irritation of the pituitary membrane affects other parts; and that the pituitary is affected ſympathetically, only in the inſtance of ſneezing, or expoſure to a ſtrong light, even if that be admitted.

V. *Progreſſive Developement of the Noſe.*—The eye, at the time of birth, is as large and as perfect in its ſtructure as it will be at any ſubſequent period of life; and moſt parts of the internal ear are equally complete in their formation, at the ſame time. But the caſe is very different with the noſe, of which the formation, at the time of birth, is very incomplete.

Inſtead of the diverſities which are obſerved in the noſes of adults, that of the fœtus and the child has almoſt invariably the ſame form, character, and ſize. It is flattened, and extends more laterally. The uniformity of its figure coincides with the general uniformity of the face at this age; and its difference from the ſhape of the adult noſe correſponds with the general difference of character in the countenance of the child and grown perſon. The back openings are very ſhort from above downwards, and very oblique: the latter circumſtance ariſes from the inclination of the pterygoid proceſſes forwards.

The cavities of the noſtrils are remarkable for their ſmallneſs: the perpendicular diameter is very inconſiderable, the antero-poſterior is longer, and the tranſverſe does not differ ſo much from that of the adult as the others.

In the ſeptum, the lamina of the ethmoid is cartilaginous, and forms a ſingle layer with that of the proper cartilage of the ſeptum: the vomer is already oſſified. The conchæ are long, but very narrow. The ethmoid cells do not yet exiſt, this part of the bone being almoſt entirely cartilaginous; but ſlight traces and rudiments of them may be diſcerned. The frontal, ſphenoidal, and maxillary ſinuſes are not yet formed. The pituitary membrane is leſs denſe, and its capillaries are very abundant. The roof of the cavity, formed by the cribriform plate, and its floor, are conſiderably advanced in their formation. The olfactory nerve is remarkably large, ſo as to preſent a ſtriking contraſt to the ſize of the organ: it is proportionably larger than the optic. The nerves of the body in general do not correſpond in ſize with the developement of the organs, as the arteries do.

It ſeems probable that the power of ſmelling is very imperfect in the infant: odours appear to affect them very little. Blumenbach notices a relation between this ſtate of the ſenſe and the condition of the individual, at the age we are now conſidering. "Cuivis attendenti quoque patet, nullo quam hoc ſenſu infantes tenellos facilius carere: nec hebetiorem diutius perferre poſſe alium, quam ipſum odoratum. Partem enim nimis adhuc imbeciles ſunt, ut ſibi ipſi alimenta quærere nequeant, nec ad diſtinctionem eorum acri odoratu indigent, verum pro reſpectu vario longe diutius, quam quodvis aliud animal, aliena cura egent. Partem quoque debiliore odoratu ipſis conſultum videtur, cum ex ipſa eorum imbecillitate nonnulla in ipſos incommoda redundent, quorum injucunditate, delicatiore naſo magis afficerentur." De Sinib. Frontal. p. 7.

The ſinuſes do not begin to be developed till ſome time after birth: the maxillary does not appear before the teeth, and its developement coincides with that of thoſe organs, but is not ſo rapid. The frontal and ſphenoidal do not begin to appear until after the maxillary. All of them are formed very ſlowly, and they are by no means of their full ſize, when the growth of the body in general has ceaſed. The change of the voice at puberty, and after caſtration, is independent of any peculiar developement of the ſinuſes.

The general cavity of the noſe has reached its full ſize in adult age, but the ſinuſes ſtill increaſe. This growth is not, however, indefinite, although we cannot aſſign the preciſe period when it ſtops. In the old ſubject, the pituitary membrane loſes its redneſs, and becomes more denſe. The power of ſmelling, as well as that of taſting, is leſs frequently loſt in old age than that of ſeeing and hearing: the former, Bichat obſerves, are more cloſely connected with the organic life, of which the functions go on in old age, after thoſe of the animal life have partly ceaſed.

VI. In the laſt diviſion we have anticipated many remarks, that might be arranged under the head of the phyſiology of ſmelling.

The nature of odours is very little underſtood, and has been the ſubject of few, if any, experimental inveſtigations. The remark of Haller is ſtill applicable to it: "Neſcio quomodo factum ſit, ut in ſalium figuras, lucis radios, aeris tremores, ſubtiliſſimis experimentis ſit inquiſitum, ad corpuſcula vero, quæ odorem excitant, cognoſcenda, adeo exigua hominum fuerit curioſitas," &c. (Elem. Phyſiol. t. v. p. 154.) The notion generally entertained is, that moſt, or perhaps all, bodies conſtantly give off a ſomething, called odorous particles or effluvia, which is expanded in the ſurrounding air. We know only that the preſence of odorous bodies is perceived by us through the medium of the atmoſphere; and that the element, whatever it be, which affects us, is of almoſt infinite diviſibility. A ſmall particle of muſk will ſcent a room for many days, and affect numerous ſucceeding atmoſpheres; yet there is no perceptible loſs of ſubſtance in the muſk. Two grains of camphor diſſolved, filled a room with its peculiar ſmell; whence it was found by calculation, that a particle not heavier than $\frac{1}{22633984000}$ of a grain, muſt have been perceived by the noſe. Haller mentions that a large quantity of papers were ſcented by a ſingle grain of ambergris, and that the odour was retained at the end of 40 years; therefore, at the loweſt calculation, a ſquare inch of paper received its odour from $\frac{1}{2691064000}$ of a grain. We ſhall not be ſurpriſed, after conſidering ſuch examples, which indeed are quite familiar, to read the accounts of travellers, who ſtate that the ſpicy fragrance of Arabia, Sumatra, Ceylon, &c. is diſcovered by the noſe at the diſtance of many miles (30 or 40, for example) from the ſhore. The power of tracing their prey by the ſcent, in animals, is another proof of the wonderful ſubtilty of the odoriferous particles; although we may be permitted to doubt ſome of the examples commonly referred to this head, as that of a dog following his maſter 100 leagues after ſome days, of the vultures being attracted from Aſia by the effluvia of the bodies after the famous battle of Pharſalia, &c. &c.

Haller concludes that the odoriferous effluvia are more groſs than light, heat, or magnetic and electric fluids; ſince they penetrate glaſs, which the former do not.

Although the odoriferous effluvia ſeem, from the preceding accounts, to be extremely ſubtle, they are capable of producing very conſiderable and well-marked effects on the human frame. Not to mention the well-known action of very unpleaſant odours in exciting naufea, and even vomiting, Haller has collected many caſes in which purging, convulſions, and even fainting, have been cauſed by ſmelling particular ſubſtances. Ambergris, muſk, roſes, &c. have had the latter effects. The idioſyncraſies, in conſequence of which the ſmell of a cat, of cheeſe, &c. cannot be tolerated, are well known. Examples are not wanting of death produced by very offenſive ſmells, particularly of the putrid kind; and it is related that very powerful aromatic ſcents have been equally fatal. The ſmell of ſaffron is ſaid to be capable of producing ſleep, even in the mules who carry it.

Haller

Haller has attempted to arrange odours into certain claſſes; but he ſeems to have arrived at no very ſtriking reſults. The diſtinctions of them, according to their effect of exciting pleaſure or averſion in us, are not quite conſtant. Although in general, as Haller obſerves, all mankind are pleaſed by the ſmell of the roſe, the violet, and cinnamon, &c., and deteſt that of a putrifying body, of fæces, or of the polecat; yet peculiarities of conſtitution, habit, and aſſociation, have great effect in making us like or diſlike particular ſmells. Haller ſays, that he could not bear the ſmell of cheeſe, of meat at all approaching to putrefaction, of garlick, or any ſtrongly ſmelling ſubſtance. We ſoon approve of the ſmell of things which are ſerviceable in miniſtering to our wants. "Gratus hinc Grænlandiæ incolis odor olei balænarum, et phocarum; quibus populis in ea ultimæ terræ habitabilis infecunditate, nihil præter piſces, natura reliquit præſidii. Eos ergo rancidiſſimos adipes eadem cum voluptate potant, cum qua Europæi calyces Falerni ſiccant. Gratus odor Siamenſibus ovorum incubatorum, qui ejuſmodi ovis veſcuntur: gratus caſei odor iis, qui hoc cibi genus amant. Africani cadaveribus putridis elephantorum paſcuntur. Romani fœtidiſſimum garum, putridorum nempe hepatum piſcium liquamen, habebant in deliciis." Elem. Phyſiol. tom. v. p. 170.

The noſe is the moſt common paſſage for the atmoſpheric air to and from the lungs in reſpiration: when the mouth is open, that alſo partly tranſmits the air, but if we continue to breathe long in this way, a diſagreeable dryneſs of the tongue, &c. is produced. The odoriferous effluvia are carried into the noſe by the air, brought into contact with the pituitary membrane, and thus impreſs the olfactory nerves, ſo as to cauſe perceptions of odours; hence we ſmell without any particular action or effort, in the ordinary proceſs of breathing. When we wiſh to explore the odorous qualities of a body more accurately, we cloſe the mouth, and draw in the air by repeated ſmall inſpirations, ſo as to bring ſeveral freſh portions into contact with the pituitary membrane: this is called ſniffing.

It is only by the medium of the atmoſphere that odours are conveyed into the noſe; if the paſſage through theſe cavities be obſtructed, as by elevating the velum palati, cloſing the front openings, by polypi, &c. the perception of odours ceaſes.

We do not conceive that the whole noſe is equally the ſeat of this ſenſe, which, on the contrary, appears confined to the upper region of the cavity, to the ſuperior turbinated bones, and the upper part of the ſeptum, on which the olfactory nerve is diſtributed. That the ſinuſes are not eſſential to ſmelling, muſt be concluded from the circumſtance that children ſmell before theſe cavities are formed. No affection of the noſe, no diſeaſe of its bones, which does not involve the parts juſt ſpecified, injures the ſenſe. The curiouſly convoluted ſtructure of the ſuperior conchæ, the artificial arrangement of the foramina and canals, both in theſe and in the ſeptum, and the numerous nerves diſtributed here, all concur in making us fix on theſe parts as the organs of ſmelling. In the plain bony excavations forming the ſinuſes, in the thin membrane lining them, and provided with hardly any diſcernible nerves, we ſee no marks of a ſtructure denoting an organ of ſenſe. In birds and fiſhes there are parts analogous to the conchæ, with ſimilar diſtribution of olfactory nerves; but no ſinuſes.

It is not, perhaps, ſo eaſy to determine the uſe of the ſinuſes. Some have conceived that they are connected with the power of ſpeech or voice, and contribute to render it more ſonorous. This notion has been well refuted by Blumenbach, with reſpect to the frontal ſinuſes; and his remarks are equally applicable to the others. "Loquelæ enim, eximiæ hominis prærogativæ, hos inſervire ſinus, ex eo improbabile eſt, quod tot animalia infra recenſenda ſimilibus quidem ſinibus, nullum vero, præter hominem, loquela inſtructum ſit: quia et variis in morbis, de quibus poſtea ſermo erit, ſinus frontales abſque loquelæ detrimento plane defecerint. Sed neque ad vocem, quæ humano generi cum reliquis animalibus, quæ per pulmones ſpirant, communis eſt, multum nobis conferre videntur. Infans enim, diu antequam ipſius confícti ſunt ſinus frontales, et antequam loqui didicit, voce acuta pollet: et multa animalia vocalia abſque ſinibus; et contra ſtupendis alia ſinibus, attamen debili ſaltem voce prædita, videbimus. Denique per univerſam fere Europam innotuit exemplum Jo. Beckii, qui cum magna palati tam mollis quam oſſei parte pleraque etiam naſi organa (*viz.* oſſa naſi, ſeptum cum vomeris maxima parte, ſpongioſa inferiora in totum, eorum autem quæ ad os cribroſum pertinent magnam partam) perdiderat. Is ſpongia obturatis ſinibus et frontis et reliquorum calvariæ oſſium, adeoque abſque ullo narium ſinuumque juvamine, imo abſque molli uvula, (quam magis deglutitioni quam ſermoni prodeſſe exinde concludere licet) diſtincte ſatis loqui, et ſonoras voces edere poterat: cum e contrario ſublata ſpongia et apertis adeo ex larynge ad ſinus calvariæ viis, plane non loqui et ægre vociferari potuerit." Prolufio Anatom. de Sinibus Frontalibus; 1779.

It ſeems moſt probable that the ſinuſes are connected with the buſineſs of ſmelling; for we can aſſign no other function to them, and they are largeſt in animals, which have this ſenſe in the greateſt perfection; we are at a loſs, however, to ſhew how they contribute to this proceſs. Some have conceived that the air, loaded with odoriferous effluvia, enters them and is retained, ſo as to make the odour more permanent. Blumenbach thinks that the frontal ſinuſes ſecrete a watery fluid, which is of uſe in moiſtening the pituitary membrane in the upper part of the noſe, and rendering it more ſenſible.

The ſenſe of ſmelling performs many important uſes in animals; it enables them to trace their prey, and conducts them, at conſiderable diſtances, to objects that afford them ſubſiſtence. By pointing out the diſtinction of wholeſome and noxious plants, it protects the health of the herbivorous tribes. It diſcloſes to them the approach of their friends and enemies; and aſſiſts in the gratification of their appetites by guiding them, at the ſeaſon of love, to thoſe of their own ſpecies.

The advantages which the human ſpecies derives from this ſenſe are not ſo obvious. In civilized ſociety we make little or no uſe of it in ſelecting our food; indeed we conſume very offenſive things, as rotten cheeſe, ſtinking meat, &c. and it is not clear that the latter is leſs wholeſome than what is freſh. Uncultivated people are not deterred by what we deem the moſt diſguſting effluvia, of putrefying whales, ſeals, fiſh, and rancid oil, from employing theſe matters for food, and do not ſeem to be injured by their uſe. A man is not led to his mate by the ſcent, like a bull or a ſtallion. We derive, however, pleaſure from the exerciſe of ſmelling, when it is employed on ſome kinds of odours; and this has been regarded as an object of the ſenſe. "Quod autem creator opt. max. humano naſo tam inſignibus ſinibus, tamque mira et intricata fabrica ſtuduerit, hoc vero tanto magis ejus bonitatem declarat, quanto certius homini naſus, non ut ceteris animantibus tantum neceſſitatis cauſa, ut victum nempe diſcernere poſſit, ſed magnam partem ad voluptatem quoque et jucunditatem datus eſt. Quanquam enim impreſſiones, odoratus ope in ſenſorium commune effectæ, tenues plerumque ſint et tranſitoriæ; tamen ex omnibus quinque,



quos

quos vulgo numerant ſenſus externos, nullus alius tam celeres tam efficaces in toto encephali et nervorum ſyſtemate producit effectus, quam ipſe, de quo agitur, odoratus. Ut enim momentaneas et mirandas vires fragrantium rerum in ſyncopatis, taceamus, certum eſt, omnium reliquorum ſenſuum effectus, quin omnino ſanitatem hominum, jucundis aut fœtidis odoribus mirum quantum vel augeri, vel hebeſcere, et perſuaſi ſumus, nullus alias ſenſationes adeo delicatas eſſe, quam quæ per odoratum fiunt." Blumenbach de Sinib. Front. p. 15.

Nose, *Fractures of.* See Fracture.

Nose, *Hemorrhage from.* See Epistaxis.

Nose, *Polypi of.* See Polypus.

Nose-*Band*, in the *Manege*, called in French *muſerelle*, is that part of the head-ſtall of a bridle that comes over a horſe's noſe.

Nose-*Bleed*, in *Botany*. See Achillea.

Nose-*Peak*, in *Geography*, a mountain on the eaſt coaſt of the iſland of Paraguay. N. lat. 8° 56'. E. long. 118° 25'.

Nose-*Point*, a cape on the eaſt coaſt of the iſland of Paraguay. N. lat. 8° 59'. E. long. 118° 42'.

NOSIMA, a ſmall iſland of Japan, in the ſtraits between Niphon and Xicoco.—Alſo, a town of Japan, in the iſland of Ximo; 20 miles N.N.W. of Taiſero.

NOSOCOMIUM, Νοσοκομειον, an hoſpital, or infirmary, for the reception of the diſeaſed.

NOSOLOGY, from νοσος, *diſeaſe*, and λογος, *diſcourſe*, ſignifies literally a treatiſe or doctrine of diſeaſes; in which ſenſe it might be conſidered as ſynonimous with *pathology*. The term *noſology*, however, has been appropriated exclusively to a methodical arrangement of diſeaſes, after the manner of the claſſification adopted by natural hiſtorians, of which ſeveral ingenious ſyſtems were deviſed during the laſt century.

The advantages reſulting from an arrangement of this kind, both to the learner and to the practitioner of medicine, have been long acknowledged by able and learned phyſicians. Baglivi, Sydenham, Boerhaave, Gaubius, and others, expreſſed their deſire to ſee ſuch a work accompliſhed, from a conviction, that, like the objects of natural hiſtory, diſeaſes would be more eaſily and certainly diſcriminated, by being arranged under genera and ſpecies, with characteriſtic definitions. In truth, the analogy in the method of inveſtigation, in both caſes, is very cloſe: for it conſiſts in ſtudying and comparing the *external characters*, and in ſeparating thoſe which are poſſeſſed in common with other genera, from thoſe which peculiarly belong to any individual genus. Thus, in reſpect to diſeaſes, as the condition and movements of the internal organs of the animal frame are not open to the immediate cognizance of our ſenſes, we can only obtain information concerning them, by an inveſtigation of the external ſigns or *ſymptoms*, which, as we are taught by experience, indicate certain internal operations. (See Disease.) Every intelligent and diſcriminating practitioner muſt, therefore, have formed a ſpecies of noſological ſyſtem in his own mind; *i. e.* he muſt have aſcertained the ſymptoms which are characteriſtic of the different forms of diſeaſe, and which diſtinguiſh each form from thoſe others which reſemble it. "Whoever denies this," as Dr. Cullen well obſerves, "may as well deny the exiſtence of the medical art. For if phyſicians can actually diſcriminate between one diſeaſe and another, they certainly can point out the marks of ſuch diſcrimination. Now theſe marks are, in fact, the very circumſtances which enter into the noſological definition of the genera and ſpecies of diſeaſe, and which it is the object of a rightly conſtructed noſological ſyſtem to explain." (See his Synopſ. Noſol. Method. Prolegom.) It can ſcarcely be doubted, then, that the ſtudy of noſology muſt contribute to improve the means of diſcrimination of the phyſician, and muſt facilitate the progreſs of the inexperienced in the acquiſition of his art.

Another advantage, which has been alluded to by Dr. Cullen, will alſo accrue from it; it will conduce to render the views of the practitioner more clear and determinate, and to lead him to inveſtigate and preſcribe for the actual varieties of diſeaſe, rather than to content himſelf with learning their titles, and with conſidering that every eſſential information has been acquired, when the name of a diſeaſe has been made out; a habit into which thoſe practitioners, whoſe education has been conducted without an attention to noſological accuracy, are too liable to fall.

Notwithſtanding the obvious and acknowledged importance of a ſyſtem of noſology, no actual attempt was made to accompliſh ſuch a work, before nearly the middle of the eighteenth century, when the able and learned Dr. F. Boiſſier de Sauvages, a profeſſor at Montpellier, publiſhed the rudiments of his ſyſtem in 1732. This work, however, contained but an imperfect outline of his final claſſification, which was not given to the world until it had been matured by extenſive inveſtigation, much reading, and aſſiduous application, for the ſpace of thirty years. It was publiſhed in 1762, under the title of "Noſologia Methodica, ſiſtens Morborum Claſſes, Genera, et Species, juxta Sydenhami mentem, et Botanicorum ordinem." As this elaborate and ingenious ſyſtem has not only been generally referred to, but forms, in fact, the groundwork of all the ſyſtems of noſology that have ſubſequently appeared, we ſhall ſtate the outlines of it with as much brevity as poſſible.

Sauvages arranged all the maladies and injuries to which the human frame is liable, under *ten* claſſes. The *firſt* claſs includes a number of ſuperficial and local affections, which, however, have no very diſtinct affinity in other reſpects, and is entitled "*Vitia.*" Theſe vitia are ſubdivided into ſeven orders or groups, comprehending ſpots, efflorescences, inflammatory tumours, excreſcences, encyſted tumours, diſplacements (*i. e.* all the varieties of hernia, &c.), and plagæ (*i. e.* fractures, diſlocations, ulcers, and wounds). His *ſecond* claſs includes the three orders of *fevers*, continued, remittent, and intermittent, with their ſeveral ſpecies. The *third* claſs compriſes the "*Phlegmaſiæ*," or inflammatory fevers, of which he makes three orders, *viz.* the exanthematic, or eruptive fevers; the membranous inflammations, ſuch as pleuriſy, gaſtritis, enteritis, &c.; and the parenchymatous, or inflammations of the ſubſtance of the different organs, as of the lungs, liver, heart, kidnies, &c. The *fourth* claſs comprehends the "*Spaſmi*," or convulſive diſeaſes, which he ſubdivides into four orders; the firſt and ſecond of which include the *tonic* or rigid ſpaſms, partial and general (ſuch as locked jaw, cramp, ſquinting, &c.); and the third and fourth, the clonic or convulſive ſpaſms, partial and general (*e. g.* tremors, palpitation, yawning, epilepſy, hyſteria, &c). The *fifth* claſs conſiſts of affections of the reſpiration, entitled "*Anhelationes*," and is ſubdivided into two orders, the ſpaſmodic affections, ſneezing, cough, hiccup, &c.; and the oppreſſive, as aſthma, dyſpnæa, ſnoring, hydrothorax, &c. The *ſixth* claſs includes thoſe maladies which are characteriſed by loſs of power, either of the whole body, or in particular organs, and is entitled "*Debilitates.*" Of this there are five orders; 1. "*Dyſæſtheſiæ*," loſt or deficient ſenſations, ſuch as blindneſs from cataract, amauroſis, deafneſs, loſs of ſmell, taſte, &c.; 2. "*Anepithymiæ*," loſs of appetites; 3. "*Dyſcineſiæ*,"

loſt

loſt or imperfect motions, including dumbneſs, loſs of voice, ſtammering, and palſy; 4. "*Leipopſychiæ*," loſt or impaired voluntary motion, as fainting, ſuſpended animation, &c.; and 5. "*Comata*," ſoporoſe diſeaſes, apoplexy, catalepſy, lethargy, &c. The *ſeventh* claſs, which compriſes the painful maladies, "*Dolores*," is likewiſe ſubdivided into five orders, according to the parts of the body in which the pains are ſeated: 1. *Vagi*, or wandering pains, including gout, rheumatiſm, catarrh, itching, laſſitude, &c.: 2. Pains of the *head*, hemicrania, tooth-ache, ear-ache, ophthalmia; 3. Of the *breaſt*, dyſphagia, pyroſis, cardiogmus; 4. Internal *abdominal* pains, heartburn, colic, pains of the liver, kidnies, &c.; and 5. Pains of the *limbs*. The *eighth* claſs comprehends the *mental* affections, "*Veſaniæ*," and conſiſts of four orders; 1. "*Hallucinationes*," ſuch as giddineſs, double viſion, hypochondriaſis, and ſomnambuliſm; 2. "*Moroſitates*," or erroneous appetites, ſuch as pica, bulimia, polydipſia, ſatyriaſis, nymphomania, noſtalgia, hydrophobia; 3. "*Deliria*," as mania, melancholy, demonomania, &c.; and 5. *Anomalous* veſaniæ, as loſs of memory. The *ninth* claſs includes diſcharges or fluxes, of which there are four orders: 1. "*Sanguifluxus*," or hæmorrhages, as hæmoptyſis, hæmatemeſis, bloody urine, uterine hæmorrhage; 2. Diſcharges from the bowels, "*Alvifluxus*," as vomiting, dyſentery, cholera, diarrhœa, teneſmus, lientery. &c.; 3. "*Serifluxus*," or watery diſcharges, morbid ſweating, diabetes, enureſis, ptyaliſm, coryza, leucorrhœa, gonorrhœa, dyſuria, &c.; and 4. "*Aërifluxus*," flatulence, &c. The *tenth* and laſt claſs comprehends the various morbid appearances, which are conſidered as the reſult of a depraved habit of body, and are entitled "*Cachexiæ*." It includes ſeven orders, the firſt of which is characteriſed by emaciation, "*macies*," and compriſes phthiſis, tabes, and atrophy; 2. The oppoſite ſtate of enlargement, "*Intumeſcentiæ*," ſuch as emphyſema, anaſarca, obeſity, pregnancy, &c.; 3. Partial dropſies, ſuch as hydrocephalus, hydrorachitis, aſcites, tympanites, &c.; 4. "*Tubera*," including rickets, ſcrofula, cancer, the yaws, &c.; 5. "*Impetigines*," as ſyphilis, ſcurvy, itch, ſcald head, lepra, and clephantiaſis; 6. Morbid complexions, "*Icteritiæ*," ſuch as jaundice, chloroſis, petechial diſeaſe; and 7. Anomalous cachexies, as the louſy diſeaſe, trichoma, alopecia, gangrene, necroſis.

Such is the outline of the able and learned arrangement of diſeaſes, which was accompliſhed by Sauvages. It diſplays an extenſive knowledge of the phyſiology and pathology of the human body, derived both from much perſonal obſervation, and from an indefatigable peruſal of the records of medicine; and, for practical purpoſes, it has not been equalled by thoſe ſyſtems which have been ſubſquently erected upon it, as a baſis, if we except perhaps that of Dr. Cullen. At the ſame time it muſt be obvious, even from a peruſal of the preceding outline, that the claſſification is not free from ſeveral errors and imperfections. Some of theſe it poſſeſſes in common with all other attempts to arrange into claſſes the works of nature; for anomalies occur in diſeaſes, as in the objects of natural hiſtory, which diſturb the unity of artificial arrangements, uniting diſſimilar genera, and rendering neceſſary the ſeparation of others, which a general analogy would connect. Other imperfections, however, in the claſſification of Sauvages, appear to be the reſult of a want of accurate attention or diſcrimination. Several diſeaſes, for inſtance, are found under more than one claſs, and bearing different generic appellations: thus the ſhingles, zoſter, or zona, of the ancients, is deſcribed under the title of herpes zoſter, and likewiſe under that of eryſipelas zoſter, probably from a doubt to which genus it bore the greater affinity. In like manner the petechial raſh is included under the genus Stomacace, in the order of hæmorrhages, and alſo under Phænigmus, in the order, Icteritiæ, of the cachectic claſs. Again, Dr. Cullen has juſtly blamed Sauvages for introducing among the genera of diſeaſe a great number of mere ſymptoms, which are trifling in themſelves, and ſeldom alone the objects of medical treatment; among theſe may be mentioned yawning, ſtretching of the limbs, laſſitude, picking of the bed-clothes, nictitation of the eyelids, &c. He has alſo made genera of diſeaſe of other changes in the animal body, which cannot be conſidered as actual diſeaſes; ſuch as pregnancy, for inſtance, the efforts of parturition, the cicatrix left after wounds, the ſenſations produced by ſevere cold or great heat, (*algor*, and *ardor*,) and ſeveral other trivial and ſcarcely morbid occurrences. Theſe obſervations are, beſides, equally applicable to a great number of the ſpecies, or ſubdiviſions of the genera, in his claſſification, which he has often multiplied unneceſſarily, and even inſerted repeatedly with different ſpecific epithets. But although, in a philoſophical point of view, as well as for the purpoſe of initiating the ſtudent into the various phenomena of diſeaſes, this multiplication of genera and ſpecies muſt be deemed objectionable; yet the practitioner, in the progreſs of his profeſſional reſearches, will be aided in the work of obſervation (a taſk of no ſmall difficulty) by the hints which this ſubdiviſion of the phenomena of diſeaſes will afford him. And this aid will be the more advantageous to thoſe who unite the peruſal of books with actual obſervation; inaſmuch as the majority of the *ſpecific* ſubdiviſions of Sauvages, are, as it were, ſynonimes of the varieties of the generic maladies, which different local circumſtances have occaſioned, as detailed by the beſt practical writers, to whom he regularly and correctly refers.

Encouraged by the example, and above all aided by the previous original labours of Sauvages, ſeveral authors ſoon followed his ſteps in the contrivance of noſological arrangements. The celebrated naturaliſt, Linnæus, was one of the firſt to extend his ſingular ſkill in claſſification to the ſubject of diſeaſes; and after having publiſhed the outlines of his ſcheme in a theſis, in 1759, he printed his ſyſtem complete in 1763, with the title of "Genera Morborum definita." It conſiſted, however, rather of a modification of the ſyſtem of Sauvages, with a change of names and titles, than of an original arrangement; and it wanted the ſupport of the medical learning and experience, which were ſo conſpicuous and valuable in the former.

In the year 1764, profeſſor Vogel, of Gottingen, publiſhed his ſyſtem of noſology, which was likewiſe a cloſe approximation to that of Sauvages, but diſplayed a conſiderable ſhare of perſonal obſervation of the phenomena of diſeaſes; and twelve years afterwards, profeſſor Sagar, of Vienna, followed a ſimilar method, and publiſhed another modification of the ſyſtem of Sauvages, under the title of "Syſtema Morborum Symptomaticum," Vienna, 1776. In the mean time, however, Dr. Cullen, the celebrated and able profeſſor of medicine in the univerſity of Edinburgh, had alſo publiſhed his own ſyſtem of noſology in the year 1772; which, although leaning upon that of Sauvages as a baſis, was much ſhortened and condenſed, by a judicious excluſion of a number of trivial genera, and of many affections which are merely ſymptomatic, as well as by an union of ſeveral other genera, which were conſidered as only more or leſs prominent ſymptoms of the ſame eſſential malady, under one genus. This abbreviation of the ſyſtem has certainly contributed to introduce a more ſimple and philoſophical view of diſeaſes, by merging under a ſmaller number of diviſions all the varieties of human malady, and thus of courſe reducing the number of curative indications, and render-

ing the principles of pathology and of therapeutics more clear and leſs complex. We ſhall, therefore, enter briefly into the detail of this noſological ſyſtem, more eſpecially as it is adopted, as a text-book, by many of the teachers of medicine at preſent.

Dr. Cullen arranged all the diſeaſes of the human frame under four claſſes; the *firſt* containing the "Pyrexiæ," or all thoſe affections which are called *febrile*; the *ſecond*, "Neuroſes," or affections of the nervous ſyſtem, that is, "diſorders of ſenſe and motion," independently of primary fever or local diſeaſe; the *third*, "Cachexiæ," or thoſe diſorders which are connected with "a depraved ſtate of the whole, or greater part of the body, without any primary fever or nervous affection;" and the *fourth*, including the "Locales," or diſeaſes of ſome *part* of the body only.

This appears to be a ſufficiently ſimple and natural diviſion of the ſubject, and the ſub-diviſions are entitled, on the whole, to the ſame commendation. In filling up theſe outlines, however, by the genera and ſpecies, ſome difficulties occur, and ſome anomalies preſent themſelves, as in every artificial claſſification; ſo that the uniformity of the principle is occaſionally broken, and ſome hypothetical analogy is reſorted to, for the purpoſe of reducing the irregularity to apparent order. For example, among the *local* diſeaſes, and in the order of Dyſorexiæ, (falſe or defective appetites,) moſt of which are referrible to diſeaſes of the organs with which theſe appetites are connected, ſuch as bulimia and polydipſia, we find the diſorder termed *noſtalgia*, (or a vehement deſire of returning to one's native country, when abſent,) which Vogel has more correctly arranged as a ſpecies of melancholy. In other caſes, an anomalous diſeaſe is forced into the claſſification, as being the ſequela or reſult of another; thus, the pulmonary conſumption, (phthiſis pulmonalis) is arranged by Dr. Cullen among the *hæmorrhages*, in the claſs of Pyrexiæ, immediately following hæmoptyſis, or ſpitting of blood, although that hæmorrhage is by no means an univerſal precurſor of phthiſis, and is commonly one of the early ſymptoms, and not the cauſe of the diſeaſe, when it actually occurs. Some other inaccuracies of a ſimilar kind will be obſerved, in examining the particulars of the generic and ſpecific claſſifications; but many advantages over the arrangement of Sauvages will likewiſe be manifeſt, in the ſame parts of the ſyſtem, and eſpecially in the condenſation of ſeveral genera into one, and in the conſideration of many of the ſpecies as mere varieties.

Dr. Cullen's firſt claſs, *Pyrexiæ*, is ſubdivided into five orders: the *firſt* of which contains the *fevers* properly ſo called, or idiopathic fevers; of which there are two ſections, the intermittent, and continued. Of the *intermittent* fevers, Dr. Cullen makes but three genera, the tertian, quartan, and quotidian, under which he comprehends, as varieties, all the forms of intermittent and remittent fevers deſcribed by authors, the ſemitertians, and double tertians, the miliary and petechial remittents, and an almoſt innumerable catalogue of ſynonimes, which he has collected from their works, and referred to among the ſpecies of Sauvages. The ſecond ſection, or the *continued* fevers, including three genera, ſynocha, or inflammatory fever, typhus, and ſynochus, compriſe alſo a great number of febrile affections, which have been deſcribed under various names by authors; but perhaps even Dr. Cullen's diviſion of the genera might be leſſened. The *hectic* fever he does not admit among the genera; becauſe he deems it invariably ſymptomatic of ſome other diſeaſe.

The *ſecond* order of Pyrexiæ, entitled "Phlegmaſiæ," compriſes the acute organic inflammations, of all the viſcera, membranes, and muſcles; as of the eye, brain, throat, lungs, heart, peritoneum, ſtomach, liver, and other viſcera of the abdomen and pelvis, rheumatiſm, and gout. Theſe again include their reſpective ſpecies; thus the cynanche, or inflammation of the throat, compriſes five ſpecies; the common quinſey (*tonſillaris*,) the ulcerous ſore throat, which, in fact, belongs to ſcarlet fever (*maligna*); the croup, or inflammation of the wind-pipe (*trachealis*); inflammation of the pharynx (*pharyngea*); and the mumps, in which the inflammation extends to the parotid glands (*parotidæa*). In like manner, the genus Pneumonia, inflammation of the lungs, includes the two ſpecies, peripneumony and pleuriſy.

The *third* order of Pyrexiæ, or febrile diſeaſes, comprehends the eruptive fevers, and is entitled "Exanthemata." It includes ten genera, ſmall-pox, chicken-pox, meaſles, ſcarlet fever, the plague, eryſipelas, the miliary raſh, nettle-raſh, pemphigus, and aphtha, with their ſpecies and varieties.

The *fourth* order, "Hemorrhagiæ," includes epiſtaxis (bleeding of the noſe,) ſpitting of blood, hæmorrhoids or piles, and menorrhagia, with conſumption following the ſecond. And the *fifth* compriſes but two genera, catarrh and dyſentery, being entitled "Profluvia," the diſcharges being naturally mucous, not bloody. The catarrh includes the common cold, the epidemic influenza, and the coughs connected with meaſles, and other fevers, as varieties.

Dr. Cullen's ſecond claſs comprehends the "Neuroſes," or "affections of the faculties of ſenſe and motion, unaccompanied by any idiopathic fever, or local diſeaſe." This claſs contains four orders, Comata, Adynamiæ, Spaſmi, and Veſaniæ. It muſt be admitted, however, that ſomewhat of hypothetic opinion has been engaged in the diſtribution of the genera and ſpecies of this claſs; ſeveral of which, eſpecially in the ſecond and third orders, are brought together rather upon fanciful grounds, than from obvious and intelligible analogy.

The *firſt* order of this claſs, "Comata," in which "the voluntary motions are impaired, together with ſopor, or a ſuſpenſion of the ſenſes," is ſufficiently natural, and includes two genera, cloſely allied to each other, *viz.* apoplexy, and paralyſis. Dr. Cullen conſidered the carus, catoche, catalepſy, (which, however, he believed to be always feigned,) cataphora, lethargy, aſphyxia, and ecſtaſis of medical writers, as different degrees or modifications of the ſame affection, and included them all under the genus apoplexy, as well as the acute hydrocephalus, which he termed apoplexia hydrocephalica. And, in like manner, he compriſed a number of genera and ſpecies under his genus paralyſis; ſuch as the hemiplegia, paraplegia, paraplexia, paralyſis, tremor, and aſthenia.

The *ſecond* order, "Adynamiæ," or "impaired involuntary motions," compriſes four genera, which are not very obviouſly allied; theſe are ſyncope (fainting), dyſpepſia (indigeſtion), hypochondriaſis, and chloroſis. The genus dyſpepſia is of very comprehenſive import; for it includes the various modifications of ſtomach-complaints, which Dr. Cullen deemed but ſo many ſymptoms of dyſpepſia, and not diſtinct diſeaſes, as the other noſologiſts maintained; ſuch are, for inſtance, the anorexia, cardialgia, gaſtrodynia, flatulentia, naufea, vomitus, ſoda, and diaphora, of theſe writers.

But the *third* order, "Spaſmi," which contains ſeventeen genera, unites diſeaſes that have ſtill leſs apparent affinity with each other, and upon very hypothetical grounds. Although tetanus, locked jaw, convulſion, chorea, epilepſy, palpitation, aſthma, hooping-cough, colic, hyſteria, and hydrophobia, may be properly comprehended among ſpaſmodic affections; it is not very clear, upon what principles

cholera

cholera and pyroſis are ſo arranged; and ſtill leſs obvious, how diarrhœa and diabetes are to be deemed diſeaſes of a ſpaſmodic character.

The *fourth* order, "Veſaniæ," which compriſes "diſeaſes of the reaſoning faculty, independently of fever or of coma," contains four genera, amentia, (imbecility of mind), melancholy, mania, and oneirodynia; the laſt of which includes the ſomnambuliſm, and night-mare.

The third claſs, *cachectic* diſeaſes, in which "the habit of body, either totally, or in great part, is depraved, without any primary fever or nervous diſeaſe," is divided into three orders, characteriſed by emaciation, enlargement, and a morbid condition of the ſkin.

The *firſt* order, "Marcores," compriſes only two genera, tabes and atrophia, both which are popularly termed conſumption, or decline; but the tabes is accompanied by hectic fever, and the atrophia is not.

The *ſecond* order of cachectic diſeaſes, "Intumeſcentiæ," is characteriſed by a preternatural enlargement of the whole, or ſome part of the body; and of theſe enlargements there are four kinds, adipoſe (fatty), flatulent, watery, and ſolid. Of the *fatty* ſwellings there is only one genus, corpulence, which, whenever it becomes ſo great as to occaſion impediment to any of the functions of life, is truly a diſeaſe. (See CORPULENCE.) Of the *flatulent* enlargements, there are three genera, emphyſema (or air contained in the cellular membrane), tympanites, (diſtention of the belly by air), and phyſometra (flatulent ſwelling of the womb). The *watery* or dropſical ſwellings take place in the cellular membrane (anaſarca), in the head (hydrocephalus externus), in the canal of the ſpine (hydrorachitis), in the cheſt (hydrothorax), in the abdomen (aſcites), in the uterus (hydrometra), and in the ſcrotum (hydrocele). The *ſolid* enlargements are phyſconia, when the hard tumour is in ſome of the viſcera of the belly, and rachitis (rickets).

The *third* order of this claſs, "Impetigines," includes ſcrofula, ſyphilis, ſea-ſcurvy, elephantiaſis, lepra, the yaws, trichoma, and jaundice.

The *fourth* and laſt claſs of Dr. Cullen's ſyſtem of noſology comprehends all thoſe diſorders which are confined to a part of the body, without influencing the conſtitution at large,—the Morbi "Locales." The numerous genera compriſed in this claſs are ſubdivided into eight orders, of which a brief account will be ſufficient to explain the nature of the claſſification.

The *firſt* order, "Dyſæſtheſiæ," includes the inſtances of "depravation or total loſs of ſome ſenſe, occaſioned by a fault of the external organ;" ſuch as blindneſs from cataract, opacity of the cornea, &c.; ſhort-ſightedneſs, nyctalopia, &c.; deafneſs, loſs of the ſmell, taſte, or touch. The *ſecond* order contains the "morbid or deficient appetites," "Dyſorexiæ;" *viz.* canine appetite, polydipſia, pica, ſatyriaſis, nymphomania, noſtalgia, anorexia, adipſia, and anaphrodiſia. The *third* order, "Dyſcineſiæ," compriſes "obſtructed or depraved motions, which ariſe from a diſorder of the organs," *viz.* loſs of voice, dumbneſs, hoarſeneſs, ſtammering, ſquinting, difficult deglutition, and contractions of the limbs. The *fourth* order, "Apocenoſes," comprehends all paſſive diſcharges, *i. e.* ſuch as "are produced without fever, or any increaſed impetus." The genera of this order are paſſive hæmorrhages, colliquative ſweats, flowing of tears (epiphora), ſalivation, involuntary diſcharge of urine, gonorrhœa. The *fifth* order, "Epiſcheſes," includes the "ſuppreſſion of accuſtomed excretions;" namely, conſtipation of the bowels, ſuppreſſion of urine, dyſuria, dyſpermatiſmus, amenorrhœa. The *ſixth* compriſes "Tumours" of various nature; aneuriſm and varix, affecting the arteries and veins, ecchymoſis, ſcirrhus, cancer, bubo, ſarcoma, warts, corns, ganglion, hydatids, white ſwelling, and exoſtoſis. The *ſeventh* order, "Ectopiæ," contains three genera of tumours, occaſioned by the removal of a part from its proper place; *viz.* hernia, prolapſus, and diſlocations. And the *laſt* order, "Dialyſes," includes the diſorders in which there is a manifeſt ſolution of continuity, or broken ſurface; namely, wounds, ulcers, herpes, tinea, itch, fractures, and caries of bones;—a group which, it muſt be admitted, has ſcarcely any other circumſtance in common, except the breach of continuity.

Theſe imperfections, however, ſeem to belong to the ſubject; and no ſyſtem of noſology has yet been deviſed, which has any pretenſions to be free from them. It will not be neceſſary, therefore, to enter into any detail of the ſyſtems which have been promulgated ſubſequently to the publication of Dr. Cullen's; for none of theſe ſeem to poſſeſs ſo decided a ſuperiority, as to have gained any general approbation; and the purpoſes of inſtruction are fulfilled with ſufficient accuracy by the former.

Among the noſological ſyſtems which have appeared ſince the firſt edition of Dr. Cullen's, beſides that of Sagar, of Vienna, already mentioned, was one promulgated by Dr. David Macbride, in his "Methodical Introduction to the Theory and Practice of Phyſic." He propoſed to arrange diſeaſes under four claſſes, univerſal, local, ſexual, and infantile; a claſſification which appears to be liable to numerous objections, but which the author did not live to complete, having publiſhed only the orders and genera of the firſt claſs. M. Pinel, about the year 1800, publiſhed, under the title of "Noſographie Philoſophique," the firſt three claſſes of a new arrangement of diſeaſes, *viz.* fevers, inflammations, and hæmorrhages, which, we believe, he has not yet completed; nor has he favoured us with the general outline of his ſyſtem. In filling up the genera and ſpecies, however, more eſpecially under the head of fevers, he has multiplied the ſubdiviſions to an extent, which ſound obſervation does not appear to warrant; and ſtated differences, where he is unable to point out the practical means of diſtinction.

Dr. Darwin promulgated, in 1796, a new claſſification of diſeaſes, which, however, was rather intended to illuſtrate a new ſyſtem of pathology, than as a methodical noſology. It was founded upon a very original view of the principles of animal life, which were made the baſis of the claſſification. Thus, Dr. Darwin conſidered the four animal faculties, irritability, ſenſibility, volition, and aſſociation, as being, when deranged, the cauſes of every diſeaſe; and, therefore, conſtituted four great claſſes of diſeaſes, which he called diſeaſes of irritation, of ſenſation, of volition, and of aſſociation. In the diſtribution of the genera and ſpecies, however, it was often neceſſary to reſort to the fancy, to determine under which claſs certain morbid affections ſhould be arranged; and many ſpecies, on the other hand, when aſcribed to derangement of more than one of theſe faculties, were neceſſarily introduced in different parts of the claſſification: ſo that diarrhœa, for inſtance, may be found under almoſt every claſs. Although this claſſification, therefore, bears intrinſic evidence of great ingenuity, as well as of much obſervation of diſeaſe, and contains many practical hints of great value; yet as a ſyſtem of arrangement, by which the practitioner is to be directed to the diſcrimination of diſeaſes, it is perhaps altogether uſeleſs.

Before we conclude this article, we may obſerve, that it has been the faſhion, among many profeſſional men, to decry the ſtudy of noſology, and the method of teaching medicine upon a noſological plan. But this can have ariſen only from

an imperfect acquaintance with its nature and tendency, and a conſequent inadequate eſtimate of its utility. It is neceſſary, as we have obſerved above, that every practitioner ſhould be enabled to diſtinguiſh diſeaſes by their ſigns, or ſymptoms, if he would hope to cure them by appropriate remedies. He muſt, therefore, poſſeſs, in his own mind, an arrangement of the characteriſtic ſymptoms of every diſeaſe, and eſpecially of the diagnoſtic ſymptoms, or thoſe by which it is diſtinguiſhed from other diſeaſes, which reſemble it, or with which it has ſeveral ſymptoms in common. The queſtion, therefore, appears to be, whether it is adviſeable to teach medicine according to a ſyſtem, in which the diagnoſtic ſymptoms are diſtinctly laid down, or to leave them to be learned by a vague and unmethodical courſe of reading and practice;—a queſtion which ſeems to anſwer itſelf. We are perſuaded that the great ſuperiority, which is commonly ſeen in practitioners of good education, is to be aſcribed, in a conſiderable degree, to the noſological method of ſtudying the principles of medical ſcience, in which they had been early initiated.

To thoſe who have not been accuſtomed to conſider this ſubject, a ſingle illuſtration will perhaps demonſtrate the truth of this obſervation. The pleuriſy, for inſtance, or inflammation of the lungs, though marked by many ſymptoms which are common to fevers and other inflammations, is characteriſed by the invariable preſence of theſe *four ſymptoms*, which conſtitute the noſological definition of pneumonia, given by Dr. Cullen; namely, "fever, pain in ſome part of the cheſt, difficult reſpiration, cough." Now, in the abſence of any one of theſe ſymptoms, however ſevere the others may be, pneumonia cannot be preſent; yet the immethodical practitioner is liable to commit ſerious miſtakes, in reſpect to this diſeaſe, from a defective view of the pathognomonic ſymptoms. Thus, wherever there is acute pain in the cheſt, with difficulty of breathing, pleuriſy is often ſuppoſed to exiſt, and blood-letting immediately reſorted to. But if there is neither cough nor fever, or if there ſhould be even cough, but the pulſe ſhould remain natural, inflammation certainly is not preſent, and blood-letting is unneceſſary, perhaps injurious. Under ſuch circumſtances, the pain and dyſpnæa originate probably from a rheumatic affection of the intercoſtal muſcles, or from a ſpaſmodic contraction of the ſame organs, or of the diaphragm; and, therefore, the appropriate remedy will be an opiate, or other antiſpaſmodic, aided by ſome external ſtimulant; yet if there be actual inflammation preſent, and the diſeaſe is treated with opium and ſtimulants, much ſerious miſchief will be produced. Again, cough and fever may occur together, and be accompanied even by ſome degree of oppreſſion of the reſpiration; yet, if there is no pain in the thorax, there is no active inflammation of the lungs; the cough is, in this caſe, probably a ſecondary or accidental ſymptom, and the fever may be totally independent of it, and of ſuch a type, that blood-letting, employed under the ſuppoſition of removing inflammation, might irrecoverably depreſs the ſtrength of the patient. Againſt ſuch important practical errors the mind is moſt effectually ſecured, when it is ſtored with correct noſological views: for, where theſe are abſent, the practitioner is apt to proceed upon a mere empirical aſſociation of certain remedies with certain prominent ſymptoms, without duly marking their combinations, or weighing their import, that is, without forming any clear opinion as to the actual ſeat and nature of the diſeaſe.

NOSOVSKOI, in *Geography*, a cape on the eaſt coaſt of Nova Zembla. N. lat. 77° 15′. E. long 64° 14′.

NOSS Head, a cape on the eaſt coaſt of Scotland, in the county of Caithneſs. N. lat. 58° 26′. W. long. 2° 5′.—Alſo, a cape on the north coaſt of Noſs iſland. N. lat. 60° 13′. W. long. 1° 5′.

Noss *Iſland*, one of the ſmaller Shetland iſlands. N. lat. 60° 12′. W. long. 1° 5′.

NOSSA *Senhora de Encarnaçoan*, a town of Portugal, in Algarve, ſituated near cape Carveiro, on the ſouth-weſt; 4 miles S. of Villa Nova da Portimao.

NOSSANO, a town of the republic of Lucca; 6 miles W. of Lucca.

NOSSEN, a town of Saxony, in the circle of Erzgeburg, on the Muldau; 12 miles S.W. of Meiſſen. N. lat. 51° 13′. E. long. 13° 11′.

NOSTALGIA, in *Medicine*, from νοστεω, *to return*, and αλγος, *pain* or *grief*, is a ſpecies of melancholy, the leading circumſtance of which is a vehement and unceaſing deſire to return home, and which of courſe occurs only in perſons who are abſent from their friends and native country.

This affection is called by the French *maladie du pays*, and by the German-Swiſs *heim-weh*, or home-grief. Zwingerus, who wrote a diſſertation upon the ſubject, denominated it *noſtomania*, and *pothopatridalgia*. Sauvages, and, after him, Dr. Cullen, have, by a ſingular ſtrained analogy, placed this diſeaſe among the morbid appetites, in the claſs of *local* diſeaſes, in their reſpective ſyſtems of noſology; as if there were a particular organ in the body, in which the *amor patriæ* is ſeated, like hunger and thirſt in the ſtomach. See Sauvages, claſs viii. gen. 11. Cullen, claſs iv.

This diſeaſe has been obſerved to be particularly frequent in the inhabitants of mountainous countries, which are in a ſtate approaching to the paſtoral condition of ſociety, and with which the local aſſociations, early impreſſed on the mind, are ſtronger than thoſe excited in leſs picturesque countries. Hence the Swiſs have always been remarkable for their tendency to fall into this ſpecies of melancholy; and great numbers have been induced to deſert from the armies of foreign ſtates, in which they have been inrolled as mercenaries. The Swiſs guards, employed by the kings of France, have been particularly remarkable from this circumſtance; and they have been obſerved to be ſeized with this malady, more eſpecially, on hearing a national air, "Ranz des vaches," which is ſung to a ballad, containing alluſions to their home, relations, and domeſtic animals; an air, however, which has nothing peculiarly pleaſing in its melody, to thoſe who connect with it no particular aſſociation of ideas.

The diſeaſe, however, is by no means peculiar to the Swiſs, or other mountaineers; but occurs among a much injured people, who have been ſuppoſed incapable of enjoying happineſs in their own way, or of feeling attachment to their country. "Noſtalgia, maladie du pays, or an ardent deſire to reviſit one's native home," Dr. Winterbottom obſerves, "is a diſeaſe which affects the *natives of Africa*, as ſtrongly as it does thoſe of Switzerland: it is even more violent in its effects on the Africans, and often impels them to dreadful acts of ſuicide. Sometimes it plunges them into a deep and incurable melancholy, which induces the unhappy ſufferers to end a miſerable exiſtence by a more tedious, though equally certain, method, that of dirt-eating. No reader of ſenſibility can peruſe, without emotion, Haller's impaſſioned regret for the calm retreat of Kaſel; but even Haller's glowing language appears cold and lifeleſs, if compared with the agonizing expreſſions of diſtreſs poured out by the poor African, when, waking from the ſleep in which deluſive fancy had wafted him back to his friends and much loved home, he finds only the cruel mockery of a dream." Account of the native Africans of Sierra Leone, vol. ii. p. 174.

The fevere and conſuming influence of this mental affection on the body, and the train of ſymptoms, tending to fatal maraſmus, which it induces, if not interrupted, as well as the ſpeedy and not leſs remarkable corporeal amendment, which the removal of the mental depreſſion occaſions, will be beſt illuſtrated by the relation of a caſe, which occurred in this country.

"In the year 1781," ſays Dr. Hamilton of Ipſwich, "while I lay in barracks at Tynemouth, in the north of England, a recruit, who had lately joined the regiment, (named Edwards,) was returned in the ſick liſt, with a meſſage from his captain, requeſting I would take him into the hoſpital. He had only been a few months a ſoldier, was young, handſome, and well-made for the ſervice; but a melancholy hung over his countenance, and wanneſs preyed on his cheeks. He complained of univerſal weakneſs, but no fixed pain; a noiſe in his ears, and giddineſs in his head; pulſe rather ſlow than frequent, but ſmall, and eaſily compreſſible. His appetite was much impaired; his tongue was ſufficiently moiſt, and his belly regular; yet he ſlept ill, and ſtarted ſuddenly out of it, with uneaſy dreams. He had little or no thirſt.

"As there were little obvious ſymptoms of fever, I did not well know what to make of the caſe. I ſuſpected he might be under an incipient typhus, and ordered what I judged neceſſary to obviate it. Some weeks paſſed with little alteration either for better or worſe, excepting that he was evidently become more meagre. He ſcarcely took any nouriſhment, yet had hitherto ſat up out of bed ſome hours every day. At length he became indolent, ſeldom ſat up at all, was conſtantly dozing, yet his ſleep never ſo ſound but he could anſwer when ſpoken to: he ſighed deeply and frequently; nor could his attention be directed to any external object. Something, it would ſeem, hung heavy on his mind. He never had any cough; yet, ſince he came into the houſe, he had waſted away conſiderably. Exerciſe was recommended, and uſed as far as he could be roufed to take it, which was never without reluctance. He was put on a courſe of ſtrengthening medicines, and wine was allowed him. All proved ineffectual. His pulſe had changed with his appearance, and was now ſmall and quick: an evident fever, of the hectic kind, with an evening exacerbation, took place. He had now been in the hoſpital near three months, and was quite emaciated, and like one in the laſt ſtage of a conſumption. His eyes were grown hollow, cheeks prominent, nails incurvated, adnata pellucid; and he was ſo weak in his limbs, that he could neither get in nor out of bed without help. Of late, alſo, he had night ſweats. In ſhort, I looked on him as loſt.

"On making my morning viſit, and inquiring, as uſual, reſpecting his reſt of the nurſe, ſhe happened to mention the ſtrong notions he had got in his head, ſhe ſaid, *of home, and of his friends*. What he was able to ſpeak was conſtantly on this topic. This I had never heard before. The reaſon ſhe gave for not mentioning it was, that it appeared to her to be the common ravings of ſickneſs and delirium. He had talked in the ſame ſtyle, it ſeems, more or leſs, ever ſince he came into the hoſpital.

"I went immediately up to him, and introduced the ſubject; and, from the alacrity with which he reſumed it, (yet with a deep ſigh, when he mentioned his never more being able to ſee his friends,) I found it a theme which much affected him. He aſked me, with earneſtneſs, if I would let him go home. I pointed out to him how unfit he was, from his weakneſs, to undertake ſuch a journey, (he was a Welſhman,) till once he was better; but promiſed him, aſſuredly, that as ſoon as he was able, he ſhould have ſix weeks to go home. He revived at the very thoughts of it."—"It ſeems he had requeſted leave to viſit his native place, ſoon after he joined; but being only a recruit, and but a few months from thence, he was refuſed. This had hung on his ſpirits ever ſince; and from thence I now dated the origin of his illneſs. I intreated him to take food, to ſtrengthen him for his journey; and, as ſoon as he was able, to go out into the open air a little every afternoon, when the weather would permit, that he might be the ſooner able to go home. He liſtened eagerly to every word I ſaid. In ſhort, his appetite ſoon mended; and I ſaw, in leſs than a week, evident ſigns of recovery. He was now lively, though ſo weak that he could not get in or out of bed without aſſiſtance: he ſtrove to ſit up: two men took him between them, in the heat of the day, and placed him on a ſeat they had erected for him on the beach, where he had a view of the ſhipping. In a little time he was able to walk. Every viſit I paid him, he reſumed the ſubject of *the furlow*, which I perſiſted in promiſing, ſeeing the good effects it had already produced; and, in leſs than two months from the time he had received this promiſe, he was able to leave the hoſpital and go to his barrack-room." See Edin. Med. Commentaries, vol. xi. p. 343.

Under this ſtate of debility of body, and melancholy brooding of the mind upon the recollections of *home*, it will readily be conceived how even deſpair, and ſuicide, may be the reſult of the violent emotions excited by hearing a national tune, or by any other impreſſion, which, by the aſſociated feelings and remembrances that it recals, brings to the view of the individual the ſubject of his morbid contemplations. And it will be not leſs evident, from the conſideration of the preceding caſe, that the employment of phyſical expedients to ſupport the ſtrength, and to correct the hallucinations of the mind, will be totally fruitleſs, until the cordial of hope and expectation be afforded. See Zwingerus Diſſ. Med. Harder Diſſ. de Noſtalgia, in Haller's Diſputationes, tom. i. xi.

NOSTOC, in *Botany*, a cryptogamic plant, *Tremella Noſtoc* of Linnæus and his followers, Engl. Bot. t. 461, is a roundiſh, leafy, inflated, plaited production, of an olive green colour, and gelatinous ſubſtance, found in paſtures, and on paths, after rainy weather, ſoon drying and ſhrivelling up to almoſt nothing. The name of *Noſtoc* is ſaid to have been given by Paracelſus, and he is reported, by Tournefort and Geoffroy, to have attributed wonderful properties to this vegetable, and to have expected to obtain from it that univerſal ſolvent, which was one of the great objects of the chemiſts of his ſchool. Geoffroy analized it, as he did all the plants that came in his way, to little purpoſe, except to prove that ſuch an analyſis, with a view to a detection of the medical uſes of plants, aſcertains nothing. Whether the attention of Paracelſus was called to this plant, by the vulgar opinion of its being the remains of a fallen ſtar, or of a Will-of-the-wiſp, does not appear. Dillenius juſtly complains, that the above French writers have not told us where that famous quack or his diſciples ſpeak of it. Some have thought it a gelatinous depoſition from the clouds, when they touch the hills; of which notion a curious inſtance is recorded by Linnæus in his Lapland Tour, v. 1. 262, where two divines wanted only the power, as they were plentifully ſtocked with the malice, of inquiſitors, to broil him alive for not believing this, and other ſimilar philoſophy. Sometimes this plant, ſometimes *Tremella arborea*, Engl. Bot. t. 2448, is called witches' butter. In ſhort, there have always been ſome wonderful or ſuperſtitious ideas attached to it, which might long ago have died away, had not the miſtakes of recent philoſophers tended to embroil rather than

than elucidate the ſubject. Certain chemiſts, in purſuit of this vegetable for their inveſtigation, being but indifferent naturaliſts, appear to have miſtaken for it ſubſtances of a very different kind. Dr. Withering obſerves that the remains of frozen frogs, after a hard winter, bear a great reſemblance to a *Tremella*, and may eaſily be miſtaken for the *Noſtoc*, except that ſome of their bones may frequently be detected in it. Others have aſſerted that the Heron often diſgorges a ſubſtance of the ſame nature and appearance. No wonder that chemiſts who fell upon theſe, inſtead of the real *Noſtoc*, proved them to be of an animal nature! The writer of this was aſſured by a friend and companion of the celebrated Spallanzani, that ſome of his experiments, at leaſt, upon the ſame ſubject, were made with young aquatic ſnails, that had not yet acquired ſhells, in the aqueduct at Genoa, and that he rejected with much contempt the information of their being ſuch, and not a real *Tremella*, though a little attention would have enabled him to trace the animals through their various ſtates, on the ſpot, from an apparently inert gelatinous maſs, like a plant, to their complete perfection. What we read therefore, in various places, relative to the animal nature of *Tremella Noſtoc*, ſhould be received with caution, till we aſcertain whether thoſe who inveſtigated the ſubject were competent to know what they were examining. As to the genuine *Noſtoc*, Geoffroy and Reaumur long ago determined its vegetable nature. Micheli deſcribes its ſeeds as ranged in lines, like ſtrings of minute beads; but we never heard of ſuch being obſerved in any Britiſh ſpecimens. S.

NOSTRE, or NOTRE, ANDREW LE, in *Biography*, an eminent planner of gardens, was born at Paris in the year 1613. He was the ſon of a gardener, and ſucceeded his father in that employment. He probably received little or no education, and was about 40 years of age when he was brought into notice by the ſuperintendant Fouquet, for whom he laid out the magnificent gardens of Vaux-le-Vicomte, celebrated by La Fontaine in his poems. In this work he was the creator of thoſe porticoes, covered walks, grottoes, labyrinths, &c. in which, at that period, the wonders of ornamental gardening conſiſted. Lewis XIV., charmed with the magnificence of Le Noſtre's plans, employed him in the decoration of his favourite reſidences; and his art was accordingly diſplayed at Verſailles, Trianon, Fontainbleau, &c. Le Noſtre went to Rome in 1678, and afterwards travelled through Italy; and it is ſaid he found nothing in the moſt celebrated gardens, that he had not deviſed in thoſe of his own planning. He was ſome time in England, and, probably on the invitation of Charles II., laid out St. James's and Greenwich parks. In 1675, when he was again in France, his long ſervices were rewarded by letters of nobleſſe, and the croſs of St. Michael. The king would have given him a coat of arms, but he replied that he had one already, "conſiſting of three ſnails ſurmounted by a cabbage." At the age of four-ſcore he deſired permiſſion to retire, which the king granted him, on condition that he would ſometimes come and ſee him. He died at Paris, in 1700, at the age of 87. He is ſaid to have had a fine taſte for the arts in general, eſpecially for that of painting; and ſome pieces of his execution are mentioned as exiſting in the royal cabinet. Moreri.

NOSTRILS, the openings of the noſe in a horſe. Theſe ſhould be large and extended, ſo that the red within them may be perceived, eſpecially when he ſneezes.

NOSTRILS, *Nares*. See NOSE.

NOSTRILS *of Birds*. See *Anatomy of* BIRDS.

NOSTRILS *of a Fiſh*. See FISH.

NOSTRILS, *Slitting of the*, in *Law*. See MAHIM.

NOT GUILTY, the general iſſue or plea of the defendant, in any criminal action. See NON EST CULPABILIS.

NOTABILIA BONA. See BONA.

NOTÆ MATERNÆ, *Mother's Spots*. See NÆVUS.

NOTARICON, the third part or ſpecies of the Jewiſh Cabala.

Rabbi Nathan, in his Great Aruch, ſays, that notaricon is when a ſingle letter is taken for the ſign of a thing, *i. e.* for a whole name. He adds, that the word comes from the Latin *notarius*, a perſon who writes in notes, or ſhort-hand; and R. Elias Levita gives the ſame account in his Theſbites; except that, in lieu of one letter for a word, he mentions two or three.

But, after all, neither the one nor the other ſeems alone ſufficient; for, as a ſingle letter frequently makes a word, ſo, in the notaricon, a whole word ſometimes ſtands for a ſingle letter.

There are, therefore, two principal kinds of notaricon: the firſt is, when, by aphæreſis, or apocope, the firſt or laſt letters of ſeveral words are joined to make a ſingle word or phraſe; which, therefore, is of two kinds, the one initial, the other final; and each is done ſeveral ways. The firſt of theſe kinds, which the rabbins call *Raſche Theboth*, appears very ancient; and is ſuppoſed, by ſome, well verſed in the Hebrew, to have taken its origin from the Pſalms, and other places of Scripture, proceeding alphabetically, *i. e.* the firſt verſe beginning with א, the firſt letter of the alphabet; the ſecond with ב, the ſecond letter, &c. See ABCEDARY.

The ſecond kind is alſo very common, and is called *Sophe Theboth*, *i. e.* the end of words. For inſtance; by telling the laſt letters of the words מהשמומהלי, *Mihi, quodnam nomen eſt? Quodnam?* They find the name of God, Jehovah. This becomes ſtill more puerile, when they take the letters backwards.

The third kind is more modern, and is more groſs and perplexed. Here a letter gives a whole word, inſtead of a word's only giving a letter; ſo that a word ſhall furniſh a whole phraſe.

Thus, for example, in the firſt word of Geneſis, בראשית, *bereſchit*, is found. He created the heaven and the earth, the ſea, the abyſs, &c.

NOTARY, NOTARIUS, primarily denotes one who takes notes, or ſhort draughts, of contracts, or other inſtruments.

From the 44th Novel of Juſtinian it appears, that contracts were firſt written in notes, or abbreviatures, by the notaries, or clerks of the tabelliones, and were not yet obligatory. Afterwards they were ingroſſed, or written at length by the tabellio himſelf, and then ſigned and ſealed.

NOTARY is more particularly uſed to denote an officer who draws and keeps notes and minutes of contracts, obligations, and other inſtruments, executed before him; and delivers out authentic copies, &c. thereof.

Ragueau diſtinguiſhes between *notarii* and *tabelliones*: notaries, he ſays, in ſeveral cities, are only to receive and paſs the minutes of contracts, and to deliver them to the parties in brief; being obliged to carry them to the tabelliones to be kept, and to have ingroſſed copies delivered out to the parties.

He adds, that the notaries were anciently clerks of the tabelliones; and that ſeparating, by degrees, from their maſters, they at length erected offices of their own; and, at laſt, took place of the tabelliones, who were ſuppreſſed.

They had their name *notarii* from *notæ*; becauſe anciently they wrote in notes, or ſhort-hand.

Notaries

Notaries are now little uſed among us, except in mercantile affairs; though in France they ſtill ſubſiſt in their legal capacity. The notaries of the chatelet are called the king's counſellors, and note-keepers.

NOTARY, *Public*, among us, is a perſon who draws, and publicly atteſts deeds or writings, between merchants, to make them authentic in another country.

Notaries have the drawing, paſſing, keeping, iſſuing, &c. of all deeds, contracts, charter-parties, &c. in the mercantile world. In their books are regiſtered proteſts, remonſtrances, &c. See NOTE and BILL.

A notary public is appointed to this office by the archbiſhop of Canterbury, and the appointment is to be regiſtered and ſubſcribed by the clerk of his majeſty for faculties in Chancery. By 41 Geo. III. cap. 7. it is enacted, that from and after Auguſt 1, 1801, no perſon ſhall be ſworn, admitted, and enrolled as a public notary, unleſs ſuch perſon has ſerved ſeven years as clerk or apprentice, &c. nor perform any notarial act, without ſuch admiſſion and enrollment, &c. under a penalty of 50*l.* The admiſſion of a notary ſhall be upon a 30*l.* ſtamp, and every notarial act ſhall be on a 5*s.* ſtamp.

NOTARIES, *Eccleſiaſtical*, were officers in the firſt ages of the church, whoſe buſineſs was to collect and preſerve the acts of the martyrs.

They are ſuppoſed to have been firſt inſtituted by St. Clement. Their number was ſeven, and they were diſpoſed in the ſeven quarters or regions of Rome.

Pope Fabian, judging the ſhort-hand of the notaries too obſcure for common uſe, added ſeven ſubdeacons to them, to tranſcribe at length what the notaries drew in ſhort.

At length theſe notaries were laid aſide, and two other kinds were eſtabliſhed in their ſtead, *viz. apoſtolical* notaries, and *epiſcopal* notaries; whoſe buſineſs lies in ſpiritual and beneficiary inſtruments.

NOTATION, in a general ſenſe, implies the repreſenting of any number, quantity, dimenſion, or operation by means of certain ſymbols or characters.

NOTATION, in *Arithmetic*, is the method of expreſſing, by means of certain ſymbols or numeral characters, any propoſed number or quantity. In the common ſcale of notation, every number is expreſſed by means of the ten characters or digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, which repreſentation is effected by giving to each digit a local as well as its proper numeral value, the invention of which method, ſimple as it now appears, is perhaps one of the moſt important improvements that has ever been made in the mathematics, and does its author as much honour as any diſcovery recorded in the hiſtory of theſe ſciences. To whom we are indebted for the advantages ariſing from this method is not known, nor even the nation whence it had its origin; ſome having attributed the invention of it to the Arabs, others to the Greeks, and others again to the Indians; which latter people have certainly a priority of claim to the two former; but whether they were the original inventors, or whether they borrowed their notion of it from any other nation, is at preſent, and probably ever will remain undecided.

The ſimplicity of this method, and the univerſal application of it to every ſpecies of calculation, render it ſo familiar to all our ideas of numbers, that we loſe ſight of the ingenuity and advantage of it by means of that which ought to render it more the object of our admiration; that is, the obvious and accurate principles upon which it is founded; and inſtead of conſidering it as a moſt ingenious diſcovery, we are apt to treat it as a neceſſary conſequence following immediately from the nature of number itſelf. That this, however, is a miſtake is evident, from the notation of the Greeks and Romans, to whom this method was unknown: in fact it does not appear to have been introduced into Europe before the latter end of the tenth century, when it was firſt taught by the Arabs to the Spaniards, with whom they had a communication, and hence it ſoon after became generally known amongſt the other European nations, though it does not appear to have been brought into uſe in England before the year 1150.

It is evident from ſeveral manuſcripts of the Arabs which are ſtill preſerved, that they derived their knowledge of it, either directly or indirectly, from the Indians, it being entitled, in ſome of their works, the "Indian Arithmetic." With regard to the characters or digits by which numbers are now almoſt univerſally expreſſed, they ſeem to be the ſame, with a very ſlight alteration, as thoſe that were originally employed for that purpoſe; but their forms are not ſuch as to throw any light upon their origin, though ſome authors, who have diſcovered more ingenuity than judgment, have endeavoured to trace them to the Greek alphabet, and hence inferring, contrary to every evidence, a Grecian origin to our preſent ſyſtem of notation. Montucla has given us, in the 11th plate of the firſt volume of his "Hiſtoire des Mathematiques," a repreſentation of the ſeveral arithmetical characters, as they have been employed by different early writers; and as theſe may be intereſting to many of our readers, we have given the ſame in *Plate Notation* of the preſent work.

In the common, or denary ſcale of notation, the value of every digit increaſes from the right hand towards the left in a tenfold proportion; thus 11111 is the ſame as 10000 + 1000 + 100 + 10 + 1, and ſo on for others; the diſtance of any figure from the right indicating the power of 10, and the digit itſelf the number of thoſe powers intended to be expreſſed, on which obvious principle it is evident, that any number whatever may be repreſented with eaſe and ſimplicity. But ſince any other number or radix might have been aſſumed inſtead of 10, the curious reader will enquire how it happened that this in particular ſhould have been ſelected as the almoſt univerſal radix by nations totally unconnected and unknown to each other, even in many rude nations, particularly amongſt the inhabitants of the iſlands in the South ſea, who have ſcarcely any notions of a regular ſyſtem of arithmetic, yet have a method of dividing their numbers into periods of tens, and the ſame has been obſerved with regard to the natives of New Holland and ſome other newly diſcovered countries. This ſingular coincidence between nations totally unknown to each other has given riſe to many philoſophical ſpeculations, from the time of Ariſtotle to the preſent day, though it ſeems to be now univerſally ſuppoſed to have had its origin in the formation of man; that is, to the circumſtance of his poſſeſſing ten fingers, by the aid of which, in all probability, calculation, or at leaſt numbering, was firſt effected; as we ſee children, in making their firſt efforts in computation, have recourſe to this means of aſſiſting their memories, and hence we may infer, that the preſent diviſion of numbers into periods of tens had its origin as ſoon as numbering was firſt attempted, that is, as ſoon as men began to aſſociate with each other. But it muſt not thence be inferred, that the mode of notation in preſent uſe followed neceſſarily from this diviſion; of the contrary of which we may be convinced by attending to the arithmetic of the Greeks, who, notwithſtanding they made uſe of the ſame diviſion, had no idea of our preſent notation. Such, however, being the caſe with regard to the diviſion of numbers, the choice of the radix 10 was the moſt natural that could have been ſelected, though it was not the beſt adapted to arithmetical calculations, 12 being much better ſuited for this purpoſe: the advantages of it,

however, are not such as to lead us to expect, or even to wish that it should ever be substituted for that which long established custom has rendered so familiar to all our ideas of numbers. But though not the best, the present scale, with the exception of the duodenary, is the most eligible that could have been devised, and as convenient as can be desired; it will, therefore, not be amiss to investigate the principles on which it is founded, and the advantages and disadvantages of it, compared with other systems; in doing which we shall avail ourselves of an interesting chapter on this subject in Barlow's Theory of Numbers.

### Prop. I.

Every number, N, may be reduced to the form $N = ar^n + br^{n-1} + cr^{n-2} + \&c. pr^2 + qr + w$; where $r$ may be any number whatever, and $a$, $b$, $c$, &c. integers less than $r$.

For let N be divided by the greatest power of $r$ contained in it, as $r^n$, and let the quotient be $a$, and remainder N'; so that

$$N = ar^n + N'.$$

Divide, again, N' by the next lower power of $r$, as $r^{n-1}$, and let the quotient be $b$, which will be an integer, or zero, as $N' >$ or $< r^{n-1}$, and the remainder N'', whence

$$N = ar^n + br^{n-1} + N''.$$

Dividing, again, N'' by $r^{n-2}$, and supposing the quotient $c$, and remainder N''', we have

$$N = ar^n + br^{n-1} + cr^{n-2} + N'''.$$

And by thus continually dividing the remainder by the next lower power of $r$, we shall be evidently brought finally to the form

$$N = ar^n + br^{n-1} + cr^{n-2} \ldots . pr^2 + qr + w,$$

in which expression, as $a$, $b$, $c$, &c. are the quotients arising from the division of a number by the highest power of $r$ contained in that number, it necessarily follows that each of those co-efficients $a$, $b$, $c$, &c. is less than $r$.

*Cor.*—If $r = 10$, then $a$, $b$, $c$, &c. are the digits by which any number is expressed in our common method of notation; thus,

$$76034 = 7 . 10^4 + 6 . 10^3 + 0 . 10^2 + 3 . 10 + 4$$
$$18461 = 1 . 10^4 + 8 . 10^3 + 4 . 10^2 + 6 . 10 + 1$$

which form is always understood in enumerating the value of any number proposed; that is, we give to every digit a *local*, as well as its original or natural value; thus, in the number 76034, the second digit from the right is 3, but we consider it as representing 30, on account of its local situation, being in the second place from the right; in the same manner the 6 represents 6000, and the 7, 70,000; so that the value of each digit is estimated according to its local situation, and its original value, the former indicating the power of 10, and the latter the number of those powers that are intended to be expressed.

*Cor.* 2.—It is evident, from the foregoing proposition, that a number may be in the same manner represented by any other value of the radix $r$, and hence arise the different scales of notation, which receive the following particular denominations according to the value of the radix:

| | | |
|---|---|---|
| If $r =$ | 2 | it is termed the Binary scale, |
| $r =$ | 3 | Ternary, |
| $r =$ | 4 | Quaternary, |
| $r =$ | 5 | Quinary, |
| $r =$ | 6 | Senary, |
| $r =$ | 10 | Denary or common scale, |
| $r =$ | 12 | Duodenary. |

And since, by the foregoing proposition, $a$, $b$, $c$, &c. are always less than $r$, the radix of the system into which they enter, therefore it follows that for every scale we must have as many characters, including the cipher, as are equal to the number expressing the radix of the system. Thus for the

| | |
|---|---|
| Binary scale, the characters are | 0, 1. |
| Ternary | 0, 1, 2. |
| Quaternary | 0, 1, 2, 3. |
| Senary | 0, 1, 2, 3, 4, 5 |
| Denary or common scale | 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. |

And hence it follows, that in the duodenary scale, we must have two additional characters for representing 10 and 11, and as these characters may be assumed at pleasure, we shall, in what follows, express 10 by the symbol $\phi$, and 11 by $\pi$, whence the digits of the duodenary scale will be

0, 1, 2, 3, 4, 5 6, 7, 8, 9, $\phi$, $\pi$.

### Prop. II.

Given the equation

$$N = ar^n + br^{n-1} + cr^{n-2} \ldots . pr^2 + qr + w,$$

in which N and $r$ are given numbers, to find the unknown co-efficients the $a$, $b$, $c$, &c.; and the exponent $n$. Or, which is the same, to transform a number from the denary to any other scale of notation.

It is evident that this may be done by Prop. I., namely, by dividing N successively by the highest power of $r$ which is contained in it, but it is more readily performed by dividing N successively by $r$; thus, if

$$N = ar^n + br^{n-1} + cr^{n-2} \ldots . pr^2 + qr + w$$

be divided by $r$, the quotient will be

$$ar^{n-1} + br^{n-2} + cr^{n-3} \ldots . pr + q$$

and the remainder $w$.

This last quotient, being again divided by $r$, gives for a quotient

$$ar^{n-2} + br^{n-3} + cr^{n-4} \ldots . p$$

and a remainder $q$. And this quotient, divided by $r$, gives a quotient

$$ar^{n-3} + br^{n-4} + cr^{n-5}$$

and a remainder $p$.

Whence it is evident that the successive remainders will be the co-efficients $w$, $q$, $p$, &c., or the digits that express any number in the scale of which $r$ is the radix.

*Example* 1.—Given $17486 = a . 6^n + b . 6^{n-1} + c . 6^{n-2} \ldots . w$, to find $a$, $b$, $c$, &c. Or, which is the same, convert 17486 from the common to the senary scale.

Here, by the foregoing proposition,

| | | |
|---|---|---|
| 6) | 17486 | |
| 6) | 2914 | $- 2 = w$ |
| 6) | 485 | $- 4 = q$ |
| 6) | 80 | $- 5 = p$ |
| 6) | 13 | $- 2 = c$ |
| 6) | 2 | $- 1 = b$ |
| | 0 | $- 2 = a$ |

Therefore, 17486, in the denary scale, is expressed by 212542 in the senary.

*Example*

*Example* 2.—Transform 1810 into both the binary and ternary ſcales.

| | | | | | |
|---|---|---|---|---|---|
| 2) | 1810 | | 3) | 1810 | |
| 2) | 905 | — 0 | 3) | 603 | — 1 |
| 2) | 452 | — 1 | 3) | 201 | — 0 |
| 2) | 226 | — 0 | 3) | 67 | — 0 |
| 2) | 113 | — 0 | 3) | 22 | — 1 |
| 2) | 56 | — 1 | 3) | 7 | — 1 |
| 2) | 28 | — 0 | 3) | 2 | — 1 |
| 2) | 14 | — 0 | | 0 | — 2 |
| 2) | 7 | — 0 | | | |
| 2) | 3 | — 1 | | | |
| 2) | 1 | — 1 | | | |
| | 0 | — 1 | | | |

Therefore, 1810 = 11100010010 in the binary ſcale; and 1810 = 2111001 in the ternary ſcale.

*Example* 3.—Transform the two numbers 844371, and 215855, from the denary to the duodenary ſcale.

| | | | | | |
|---|---|---|---|---|---|
| 12) | 844371 | | 12) | 215855 | |
| 12) | 70364 | — 3 | 12) | 17987 | — 11 = γ |
| 12) | 5863 | — 8 | 12) | 1498 | — 11 = γ |
| 12) | 488 | — 7 | 12) | 124 | — 10 = ϕ |
| 12) | 40 | — 8 | 12) | 10 | — 4 = 4 |
| 12) | 3 | — 4 | | 0 | — 10 = ϕ |
| | 0 | — 3 | | | |

Hence 844371 is expreſſed by 348783 in the duodenary ſcale, and 215855 by ϕ4ϕγγ.

And thus a number is readily transformed from the denary, to any other ſyſtem of which the radix is given, and hence we find 1000 is expreſſed in the following manner, according to the value of the radix $r$.

| | | | |
|---|---|---|---|
| If $r$ = | 2, | 1000 = | 1111101000 |
| $r$ = | 3, | 1000 = | 1101001 |
| $r$ = | 4, | 1000 = | 33220 |
| $r$ = | 5, | 1000 = | 13000 |
| $r$ = | 6, | 1000 = | 4344 |
| $r$ = | 7, | 1000 = | 2626 |
| $r$ = | 8, | 1000 = | 1750 |
| $r$ = | 9, | 1000 = | 1331 |
| $r$ = | 10, | 1000 = | 1000 |
| $r$ = | 11, | 1000 = | 82ϕ |
| $r$ = | 12, | 1000 = | 6γ4 |

Hence it is evident, as it is, indeed, from the nature of the ſubject under inveſtigation, that the greater the radix is, the leſs will be the number of digits neceſſary for expreſſing any given number, but the operations of multiplication, diviſion, &c. will be the more complex; and therefore, in judging of the advantages and diſadvantages of different ſyſtems, we ought to keep both theſe circumſtances in view, as alſo a third, which is the number of prime diviſions of the radix, and on a juſt eſtimate of the whole, the radix 12 will be found preferable to any of the other ſyſtems: but on this ſubject we ſhall add a few remarks at the concluſion of this article.

### Prop. III.

To transform a number from any other ſcale of notation to the denary, or common ſcale.

This propoſition is the converſe of the foregoing one, and it is readily effected by the reverſe operation.

For let $ar^n + br^{n-1} + cr^{n-2} \ldots pr^2 + qr + w$, repreſent a number in any known ſcale of notation, whoſe radix is $r$; then ſince $a$, $b$, $c$, &c. are alſo known, we have only to collect the ſucceſſive values of the different terms, and their ſum will be the number transformed as required.

*Example* 1.—Transform 7184 from the duodenary to the common ſcale of notation. Firſt,

$$7184 = 7 \cdot 12^3 + 1 \cdot 12^2 + 8 \cdot 12 + 4.$$

Therefore we have

| | | | |
|---|---|---|---|
| | $7 \cdot 12^3$ | = | 12096 |
| | $1 \cdot 12^2$ | = | 144 |
| | $8 \cdot 12$ | = | 96 |
| | 4 | = | 4 |
| Duodenary | 7184 | = | 12340 |

*Example* 2.—Transform 1534 from the ſenary to the denary ſcale.

| | | | |
|---|---|---|---|
| 1534 = | $1 \cdot 6^3 + 5 \cdot 6^2 + 3 \cdot 6 + 4$ | | |
| | $1 \cdot 6^3$ | = | 216 |
| | $5 \cdot 6^2$ | = | 180 |
| | $3 \cdot 6$ | = | 18 |
| | 4 | = | 4 |
| Senary | 1534 | = | 418 in the common ſcale. |

*Cor.*—By means of the two foregoing propoſitions, a number may be transformed from one ſcale of notation to another, neither of which is the denary, by firſt transforming it from the given ſcale to the common ſcale, and then into the particular one required.

### Prop. IV.

In every ſcale of notation where radix is $r$, the ſum of all the digits expreſſing any number when divided by $n - 1$; will leave the ſame remainder as the whole number divided by $r - 1$. That is, if

$$N = ar^n + br^{n-1} + cr^{n-2} \ldots pr^2 + qr + w,$$

then will $N \div (r - 1)$, leave the ſame remainder as

$$(a + b + c \ldots p + q + w) \div (r - 1).$$

For make $r - 1 = r'$, or $r = r' + 1$, then $r^n \div (r - 1) = (r' + 1)^n \div r'$ will leave a remainder 1, becauſe every term of the expanded binomial $(r' + 1)^n$, is diviſible by $r$, except the laſt, which is 1, and conſequently $(r' + 1)^n \div r'$, or $r^n \div (r - 1)$, will leave a remainder 1, and this property is entirely independent of the value of $n$; and hence it follows, that every power of $r$, divided by $r - 1$, will leave a remainder 1, or each of the powers $r^n$, $r^{n-1}$, $r^{n-2}$, &c. is

is of the form $m\,(r-1)+1$; that is, $r^{\phi} = m\,(r-1)+1$, whatever integer value is given to $\phi$: and hence it follows, that

$$\begin{array}{lll} ar^n & = am & (r-1)+a \\ br^{n-1} & = bm' & (r-1)+b \\ cr^{n-2} & = cm'' & (r-1)+c \\ \text{\&c.} & & \text{\&c.} \\ pr^2 & = pm''' & (r-1)+p \\ qr & = qm^{\text{iv}} & (r-1)+q \\ w & = & w \end{array}$$

and consequently

$$N = m^{\text{v}}\,(r-1) + (a+b+c+\ldots p+q+w)$$

and, therefore, when divided by $r-1$, it will evidently leave the same remainder as the sum of its digits ($a+b+c$ and $w$).

*Cor.* 1.—Hence, if the sum of the digits in any system of notation be divisible by $r-1$, the number is divisible by $r-1$; therefore, in the common scale, if the digits of a number be divisible by 9, the number itself is divisible by 9; and if the sum of the digits be even, and divisible by 9, then will the number itself be divisible by 18; because if an even number be divisible by an odd number, it is divisible by double that number. And since 3 is a factor of 9, the same property that has been shewn to belong to the number 9, belongs also to 3; namely, if the sum of the digits of a number be divisible by 3, the number itself is divisible by 3; and if the sum be even also, then will the number be divisible by 6.

*Cor.* 2.—It is upon this obvious principle that our rule for proving the truth of operations in multiplication, division, &c. is founded, by dividing by, or casting out the 9's contained in the two factors, and the product, and what remains of this last, ought to be equal to what remains of the product of the two former remainders divided by 9, if the work be right.

For let $a$ and $b$ represent any two factors, and make

$$\begin{aligned} a &= 9n + a' \\ b &= 9m + b' \end{aligned}$$

then $ab = 9\,(9nm + ma' + nb) + a'b'$; and, therefore, $ab \div 9$, leaves the same remainder as $a'b'$ divided by 9: but the remainder of $a$ by 9, is the same as the digits of $a$ by 9, and the remainder of $b \div 9$, is the same as the digits of $b$ by 9, and the same of the product $ab$; and hence the reason of the rule. The same is obviously true for any other system of notation, by taking the number next less than the radix for the divisor. Thus, for example, we have seen that $215855 = \phi 4 \phi\gamma\gamma$ in the duodenary scale, and $215855 \div 11$, leave a remainder 2, but $\phi + 4 + \phi + \gamma + \gamma = 10 + 4 + 10 + 11 + 11 = 46$, which divided by 11 gives also a remainder 2. Suppose it was required to multiply $\phi 4 \phi\gamma\gamma$ by $\phi\phi 4$, the operation and proof would stand thus:

Operation.

| | |
|---|---|
| $\phi 4 \phi\gamma\gamma$ | rem. 2 |
| $\phi\phi 4$ | rem. 2 |
| $3577\gamma 8$ | |
| $8811\gamma 2$ | |
| $8811\gamma 2$ | |
| 95088918 | rem. 4 |

Proof by 11.


It is unnecessary to observe, that in this operation, as in all others in which the radix is $r$, we must, in multiplying, dividing, &c. divide by the radix, that is, by 12 in the above example, and set down the overplus, instead of dividing by 10, and setting down the overplus, as is done in the common scale.

## Prop. V.

In any scale of notation whose radix is $r$, the difference of the remainder of the sum of the 1st, 3d, 5th, &c. digits divided by $r+1$, and the sum of the 2d, 4th, 6th, &c. digits, divided also by $r+1$, is equal to the remainder of the whole number divided by $r+1$.

Let $N = ar^n + br^{n-1} + cr^{n-2} \ldots . pr^2 + qr + w$; then will the remainder of $(w + p + b, \text{\&c.}) \div r+1$, minus the remainder of $(q + c + a, \text{\&c.}) \div r+1$, be equal to the remainder of $N \div r+1$.

For make $r+1 = r'$, or $r = r'-1$, then it is evident that $\dfrac{(r'-1)^n}{r'}$ will leave a remainder $+1$, or $-1$, according as $n$ is even or odd; for all the terms in the expanded binomial $(r'-1)^n$ are divisible by $r'$, except the last, which is $+1$ or $1$, according as $n$ is even or odd, independently of any other value of $n$; and, therefore, $\dfrac{r^n}{r+1}$ will also leave the same remainder in the same cases; that is, every odd power of $r$ is of the form $m\,(r+1)$, and every even power of $r$ is of the form $n\,(r+1)$. Therefore, in the above expression, we have

$$\begin{array}{lll} w & = & +w \\ qr & = & qm\,(r+1) - q \\ pr^2 & = & pn\,(r+1) + p \\ cr^{n-2} & = & cm'\,(r+1) - c \\ br^{n-3} & = & bn'\,(r+1) + b \\ ar^n & = & am''\,(r+1) - a \\ \text{\&c.} & & \text{\&c.} \end{array}$$

And consequently,

$$N = m'''\,(r+1) + w - q + p - c + b - a;$$

and, therefore, when divided by $r+1$, it will leave the same remainder as $(w - q \quad p - c + b - a)$ divided by $r+1$, or as $(w + p + b, \text{\&c.}) \div (r+1) - (q + c + a, \text{\&c.}) \div (r+1)$.

*Cor.*—Hence, in the common scale, if the sum of the digits in the odd places is equal to the sum of those in the even place; or, if one exceed the other by 11, or any multiple of 11, the whole number may be divided by 11.

*Cor.* 2.—The above proposition furnishes us with another rule for proving the truth of the operation in multiplication, division &c. which, in the common scale of notation, the radix being 10, is as follows.

From the sum of the digits in the 1st, 3d, 5th, &c. places, subtract those in the 2d, 4th, 6th, &c. places in both factors, and in the product; also reserve the three remainders, when each of those differences is divided by 11; multiply the two former together, and cast out the 11's, which remainder ought to be equal to the remainder of the product, if the work be right. *Note*, If the sum of the 2d, 4th, &c. digits be greater than the sum of the 1st, 3d, &c. 11 must be added to the latter.

Thus,

Thus, for example, to prove the truth of the multiplication in the following example.

| | | | |
|---|---|---|---|
| 741746 | diff. of digits | 5 | |
| 3462 | diff. of digits | 8 | |
| 1483492 | | 11(40 | Proof. |
| 4450476 | | | 7 / 8 |
| 2966984 | | rem. 7 | 5 / 1 |
| 2225238 | | | |
| 2567924652 | diff. - - | 7 | |

This method, though not ſo eaſily expreſſed, is as ready in practice as the rule by 9's, and being independent of it, we may conclude, with a very conſiderable degree of certainty, that any example that proves right by both rules, is really ſo in the operation. And the ſame rule is applicable to any other radix, by making that radix plus 1 the diviſor.

*Cor.* 3.—By means of Cor. 1. Prop. 4. and Cor. 1. Prop. 5. we are enabled to aſcertain if a number be diviſible by 3, 6, 9, 11, and 18, without attempting the operation, which is uſeful in finding the common meaſure of two numbers, reducing a fraction to its loweſt terms, &c. And to theſe rules we may add the following; *viz.* if a number terminates with 5 or 0, it is diviſible by 5 in both caſes, and by 10 in the latter caſe; and if the two laſt digits of any number is diviſible by 4, the whole number is diviſible by 4; if the three laſt digits be diviſible by 8, the number is diviſible by 8; and generally, if the $n$ laſt digits be diviſible by $2^n$, the whole number is diviſible by $2^n$.

For every number ending in 5 or 0, is of one of the forms $10\,N + 5$, or $10\,N + 0$, both of which forms are evidently diviſible by 5, and the latter by 10.

Again, every number may be expreſſed by $A \times 10^n + B$, where B repreſents the $n$ laſt digits: thus, for example, $7846144 = 784614 \times 10 + 4 = 78461 \times 10^2 + 44 = 7846 \times 10^3 + 144$, &c. And ſince 10 is diviſible by 2, $10^n$ is diviſible by $2^n$; therefore, in the form $A \times 10^n + B$, which may repreſent any number whatever, $10^n$ is diviſible by $2^n$, and B by $2^n$ by hypotheſis, therefore $A \times 10^n + B$ is diviſible by $2^n$, if B be ſo; that is, if the $n$ laſt digits be diviſible by $2^n$.

## Prop. VI.

To perform duodecimal operations by means of the duodenary ſcale of notation.

*Rule.*—Transform the number of feet, if above 12, into the duodenary ſcale, and ſet the inches and parts as decimals. Then multiply as in common arithmetic, except carrying for every 12 inſtead of for every 10, as in the common operations, and in the reſult transform again the integral part of the product into the denary ſcale.

*Exam.* 1.—Multiply 17 ft. 3 in. 4′ by 19 ft. 5 in. 11′

| | | | | |
|---|---|---|---|---|
| 17 | 3 | 4 | = | 15·34 |
| 19 | 5 | 11 | = | 17·5τ |
| | | | | 13ϕ08 |
| | | | | 7248 |
| | | | | ϕ0τ4 |
| | | | | 1534 |

Proof by 11.

4 / 2 / 2 / 4

336 ft. 9 in. 6′ 8″ 8‴ 240·9688 anſwer.

*Exam.* 2.—Find the ſolidity of a cube, whoſe ſide is 13 ft. 7 in. 7′.

| | | | | |
|---|---|---|---|---|
| 11·77 | = | 13 | 7 | 7 |
| 11·77 | | | | |
| 7τ51 | | | | Proof. |
| 7τ51 | | | | 3 / 5 / 5 / 3 |
| 1177 | | | | |
| 1177 | | | | |
| 135·9τ61 | | | | |
| 11·77 | | | | |
| 9049867 | | | | 4 / 3 / 5 / 4 |
| 9049867 | | | | |
| 1359τ61 | | | | |
| 1359τ61 | | | | |

1571·281417 = 2533 ft. 2 in. 8′ 1″ 4‴ 1ᵛ 7ᵛ anſ.

This method was firſt publiſhed by the writer of this article, in Nicholſon's Journal, vol. xxv. and it appears to poſſeſs conſiderable advantage over the common rule, both on account of the facility of operation, and the accuracy of the reſult, as likewiſe that it may thus be ſubmitted to proof, the ſame as common multiplication, which it is not poſſible to apply to the old method. In the above examples, the proof of 11 is only made uſe of; but it is obvious that it might alſo be proved by 13, according to the rule in Prop. 5.

And in the ſame manner, any other arithmetical operation, ſuch as diviſion, extracting the ſquare root, &c. is performed with as much facility as in common numbers.

*Exam.* 3.—Given the area of a rectangle equal to 174 feet 11 inches, and its length 15 feet 7 inches; to find its breadth in feet, inches, &c.

174 ft. 11 in. = 126·γ, and 15 ft. 7 in. = 13·7

137)126·γ(γ·2841
1235

360
272

ϕϕ0
ϒ48

540
524

180
137

45

Proof by 11.

0 / 0 / 4 / 0

The breadth is, therefore, 11 ft. 2 in. 8′ 4″ 5‴.

As the above method of proving diviſion is ſeldom or never given in books of arithmetic, it may not be amiſs to ſay how it is effected, which is this; from the ſum of the digits in the dividend, take thoſe in the remainder; then the remainder from the diviſor and quotient ought to be equal to that of the dividend thus reduced, if the work be right. The reaſon for which is evident, becauſe the dividend minus the remainder may be conſidered as the product ariſing from the multiplication of the dividend and quotient.

*Exam.*—Given the breadth and area of a rectangle, equal to 24 feet 9 inches, and 971 feet 10 inches, to find its length.

24 ft. 9 in. = 20·9, and 971 ft. 10 in. = 68γ·φ.

```
20·9)68γ·φ(33·323
      623
      ---
       68φ
       623
       ---
        670
        623
        ---
         490
         416
         ---
          760
          623
          ---
          139
          ---
```

Proof by 11.

```
  0
0   3
  0
```

Therefore its length is 39 ft. 3 in. 2′ 3‴.

And the same principles are equally applicable to the extraction of the square root, as is evident by the following example.

*Exam.*—Having given the area of a square equal to 17 ft. 4 in. 6′, required the length of its side.

```
15·46(4·202φ
14
---
 82   146
  2   144
 ---  ----
8402   20000
   2   14804
 ----  -----
8404   73γ800
       6γ4404
       ------
        473γ8
        -----
```

Proof.

```
5
7 7
5
```

Therefore the side is 4 ft. 2 in. 0′ 2″ 10‴.

And thus may any other numerical operation be performed with as much facility as in common arithmetic.

Let us now shew the application of the preceding principles to two or three curious problems proposed by Euler, in his "Analysis Infinitorum."

## Prop. VII.

Every number less than $2^{n+1}$ is compounded of some number of terms in the series

$$1,\ 2,\ 2^2,\ 2^3,\ 2^4,\ 2^5,\ \&c.\ 2^n.$$

This is made evident by transforming the given number $N < a^{n+1}$ into the binary scale, which, from what has been observed at Cor. 2. Prop. 1, will assume the form

$$N = a \cdot 2^n + b \cdot 2^{n-1} + c \cdot 2^{n-2} \ldots . p \cdot 2^2 + 9 \cdot 2 + w,$$

where $a$, $b$, $c$, &c. are each less than 2, and consequently either 0 or 1; and as every number less than $2^{n+1}$ may be thrown into this form; therefore, with the above series, every number whatever within the assigned limits may be compounded of some number of those terms.

*Cor.* 1.—What is said in the above demonstration not only proves the truth of the theorem, but also points out the method by which it is to be effected; and at the same time it is evident, that there is only one way in which the selection can be made.

*Cor.* 2.—In the above theorem the greatest power of 2 is $2^n$; and, consequently, the greatest number that can be formed is $2^{n+1}-1$; but if the power of 2 be unlimited, so also will the number that may be compounded of those terms; that is, any number whatever may be compounded of the terms of the indefinite series 1, 2, $2^2$, $2^3$, $2^4$, &c.

*Exam.*—Having a series of weights of 1lb. 2lb. 4lb. 8lb. 16lb. &c., it is required to ascertain which of them must be selected to weigh 1719 lb.

First, 1719, in the binary scale, is represented by 11010110111; the weights, therefore, to be employed, are 1 lb. + 2 lb. + $2^2$ lb. + $2^4$ lb. + $2^5$ lb. + $2^7$ lb. + $2^9$ lb. + $2^{10}$ lb.

## Prop. VIII.

Every number whatever may be formed by the sums and differences of the terms of the geometrical series 1, 3, $3^2$, $3^3$, &c.

For by transforming the given number N into the ternary scale of notation, it will assume the form

$$N = a\,3^n + b\,3^{n-1} + c\,3^{n-2} \ldots . p\,3^2 + q\,3 + w,$$

where each of the co-efficients $a$, $b$, $c$, &c. are less than 3, and, consequently, they must be either 2 or 1 or 0. Now, in order to prove the truth of the theorem, it will be better to select a partial example, the reasoning on which will be evidently applicable to every other case. First, then, it is obvious, that if no one of these co-efficients be greater than 1, the question is resolved agreeably to the conditions of the proposition. We need, therefore, only consider the case, in which some one or more of the co-efficients are equal to 2. Let, then,

$$N = 3^n + 2 \cdot 3^{n-1} + 0 \cdot 3^{n-2} + 2 \cdot 3^{n-3} + 3^{n-4} + 0 \cdot 3^{n-5} + 2 \cdot 3^{n-6},\ \&c.$$

And since $3 \cdot 3^{n-6} = 3^{n-5}$, and $3 \cdot 3^{n-3} = 3^{n-2}$, $3 \cdot 3^{n-1} = 3^n$

The above expression is the same as

$$(2 \cdot 3^n + 3^{n-2} + 3^{n-4} + 3^{n-5}) - (3^{n-1} + 3^{n-3} + 3^{n-6}) =$$
$$(3^{n-1} + 3^{n-2} + 3^{n-4} + 3^{n-5}) - (3^n + 3^{n-1} + 3^{n-3} + 3^{n-6}) = N$$

agreeably to the conditions of the proposition.

*Remark.*—The latter part of the above demonstration is only for a particular case, but it is evident that the same reasoning will apply to any case, or even to the general form; but it would have only tended to lengthen and embarrass the demonstration, and at the same time would not have added to the certainty of the conclusion; for which reason, it was thought better to proceed as above. This demonstration, like that in the foregoing proposition, has the advantage of pointing out the method of solution, at the same time it proves the truth of the theorem, and, like that also, shews that there is only one way in which the solution can be effected.

*Cor.*—It appears from this theorem, that with a series of weights, 1 lb. 3 lb. $3^2$ lb. $3^3$ lb. $3^4$ lb. &c., any number of pounds whatever may be ascertained, by placing some of those weights in one scale, and some in the other, when the case requires it, or only in one scale, when the given weight is compounded of any number of those terms. The solution of which problem is readily deduced from the foregoing demonstration.

*Exam.* 1.—Required in what manner the weights must be

be ſelected out of the foregoing ſeries, to weigh 716 pounds.

Firſt, 716, in the ternary ſcale, is expreſſed by

| | | |
|---|---|---|
| | 222112 | |
| Add | 1 | $= 1$ |
| | 222120 | |
| Add | 10 | $= 3$ |
| | 222200 | |
| Add | 100 | $= 3^2$ |
| | 1000000 | $= 3^6$ |

Therefore, $222112 = 3^6 - (3^2 + 3 + 1)$; that is, $3^6$ muſt be placed in one ſcale, and the three weights $3^2 + 3 + 1$ in the other ſcale, with the body to be weighed.

*Exam.* 2.—What weights out of the above ſeries muſt be ſelected to aſcertain a weight of 1319 lb.

Firſt, $1319 = 1210212$ in the ternary ſcale

| | | |
|---|---|---|
| | 1210212 | |
| Add | 1 | $= 1$ |
| | 1210220 | |
| Add | 10 | $= 3$ |
| | 1211000 | |
| Add | 100000 | $= 3^5$ |
| | 2011000 | |
| Add | 1000000 | $= 3^6$ |
| | 10011000 | $= 3^7 + 3^4 + 3^3$ |

And hence we conclude, that the weights $3^7 + 3^4 + 3^3$ muſt be put in one ſcale, and the weights $3^6 + 3^5 + 3 + 1$ in the other ſcale, with the body whoſe weight is to be aſcertained.

Theſe curious numerical problems are mentioned by Euler at page 253 of his "Analyſis Infinitorum," and the poſſibility of any weight being aſcertained by ſuch a ſyſtem of weights is rigorouſly demonſtrated; but the demonſtration in the two foregoing problems is much ſimpler, and they have moreover the advantage of indicating the mode of ſolution, which is not attainable by Euler's method.

Before we conclude this article, it will not be improper to make a few general obſervations on the comparative advantages and diſadvantages of the different ſcales of notation, which have been the ſubject of our inveſtigation. On this head, ſimplicity is evidently the firſt conſideration to be attended to, for in that alone conſiſts the ſuperiority of one ſyſtem over another; but this ought to be eſtimated on two principles, *viz.* ſimplicity in arithmetical operations, and in arithmetical expreſſions. Leibnitz, by conſidering only the former, recommended the binary ſcale, which has certainly the advantage in all arithmetical operations in point of caſe, but this is more than counterbalanced by the intricacy of expreſſion, on account of the number of figures neceſſary for repreſenting a number of any conſiderable extent; thus we have ſeen, Prop. 2, that 1000 in the binary ſcale would require 10 places of figures, and to expreſs 1000000, we muſt have 20 places, which would neceſſarily be very embarraſſing; at the ſame time, that all calculations would proceed very ſlowly, on account of the number of figures that muſt be made to enter therein.

The next ſcale that has been recommended is the ſenary, which certainly poſſeſſes ſome important advantages; firſt, the operation with this ſyſtem would be carried on with facility; the number of places of figures for expreſſing a number would not be very great; beſide, that thoſe quantities, equivalent to our decimals, would be more frequently finite than they are in our ſyſtem: for example, every fraction, whoſe denominator is not ſome power of one of the factors of 10, is indefinite, and thoſe only are finite, that contain the powers of thoſe factors; and it is exactly the ſame in every other ſcale of notation; *viz.* thoſe fractions only are finite, that have denominators compounded of the powers of the factors of the radix of that ſyſtem; therefore, in the decimal ſcale only fractions of the form $\frac{a}{2^n 5^m}$ are finite, and in the ſenary ſcale the finite fractions are of the form $\frac{a}{2^n 3^m}$; and as there are neceſſarily more numbers of the form $2^n 3^m$ within any finite limit, than there are of the form $2^n 5^m$, it follows, that in a ſyſtem of ſenary arithmetic, we ſhould have more finite expreſſions for fractions than we have in the denary, and conſequently, on this head, the preference muſt be given to the ſenary ſyſtem; and, indeed, the only poſſible objection that can be made to it is, that the operations would proceed a little ſlower than in the decimal ſcale, becauſe in large numbers a greater number of figures muſt be employed to expreſs them. This leads us to the conſideration of the duodenary ſyſtem of arithmetic, which, while it poſſeſſes all the advantages of the ſenary, in point of finite fractions, it is ſuperior even to the decimal ſyſtem for ſimplicity of expreſſion; and the only additional burden to the memory, is two characters for repreſenting 10 and 11; for the multiplication table in our common arithmetic is generally carried as far as 12 times 12, although its natural limit is only 9 times 9, which is a clear proof, that the mind is capable of working with the duodenary ſyſtem, without any inconvenience or embarraſſment; and hence we may conclude, that the choice of the denary arithmetic did not proceed from reflection and deliberation, but was the reſult of ſome cauſe operating, in an unſeen and unknown manner, on the inventor of this ſyſtem; and it may, therefore, be conſidered as a fortunate circumſtance, that for this unpremeditated index, that particular one ſhould have been ſelected, which holds at leaſt the ſecond place in the ſcale of general utility. This circumſtance, as we have before obſerved, is undoubtedly connected with the formation of man, which has led all nations to the diviſion of numbers into periods of 10, and which naturally ſuggeſted the idea of making this number the radix of the ſyſtem. Still, however, the peculiar method which we employ in the repreſentation of numbers, muſt not be conſidered as ariſing out of this diviſion, but as an improvement introduced a long time afterwards, as is evident from the arithmetic of the Greeks; who, notwithſtanding they made uſe of the ſame diviſion, had no idea of our preſent ſyſtem of notation, the great and important advantage of which, is the giving to every digit a local as well as its original or natural value, by means of which we are enabled to expreſs any number, however large, by the combination of only ten numerical ſymbols, whereas the Greeks, for want of this method, were under the neceſſity of uſing 36 different characters, and with which they were not for a long time able to expreſs a number greater than 10000; this was, however, afterwards indefinitely extended by the improvements of Archimedes, Apollonius, Pappus, &c. We have given, under the article CHARACTERS, a general idea of

of the notation of the Greeks: it will, however, be intereſting to many of our readers to have a ſlight ſketch of their arithmetical operations; we ſhall, therefore, before we conclude this article, enter upon the ſubject, and ſhall explain a little more at large the nature of their notation.

The characters employed by the Greeks were principally derived from their alphabet, and conſidering the number of them, their arithmetic was managed with conſiderable facility, though it muſt be acknowledged that it fell very ſhort of that ſimplicity which is ſo ſtrongly characteriſtic of the modern method.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Inſtead of our digits | 1, | 2, | 3, | 4, | 5, | 6, | 7, | 8, | 9, |
| the Greeks employed | α, | β, | γ, | δ, | ε, | ζ, | ζ, | η, | θ. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| To repreſent they uſed | 10, | 20, | 30, | 40, | 50, | 60, | 70, | 80, | 90, |
| | ι, | κ, | λ, | μ, | ν, | ξ, | ο, | π, | ϟ. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| To expreſs they made uſe of | 100, | 200, | 300, | 400, | 500, | 600, | 700, | 800, | 900, |
| | ρ, | σ, | τ, | υ, | φ, | χ, | ψ, | ω, | ϡ. |

But for the thouſands, 1000, 2000, &c. inſtead of any diſtinct characters, they employed for this purpoſe

α, β, γ, δ, ε, ζ, ζ, η, θ;

that is, they had recourſe again to their characters for the ſimple units, with this difference only, that, in order to diſtinguiſh them from the former, they placed a ſmall iota, or daſh, below the letter.

With theſe characters it is evident that the Greeks could expreſs any number under 10,000, or a myriad; thus

| | | |
|---|---|---|
| 991 | was repreſented by | ϡαι |
| 9999 | ——— | ϡθιθ |
| 7382 | ——— | ζτπβ |
| 8036 | ——— | ηλζ |
| 6420 | ——— | ζυκ |
| 4001 | ——— | δα |

And ſo on for other numbers; whence it is evident, that neither the order nor the number of characters had any effect in fixing the value of any number intended to be expreſſed; for 4001 is expreſſed by two characters, 6420 by three, and 7382 by four. Alſo, the value of each of thoſe expreſſions is the ſame, in whatever order they are placed; thus, ϡθι is the ſame as ϡιθθ, or as ιθϡ; and ſo on for any other poſſible combination; but as regularity tended, in a great meaſure, towards ſimplicity, they always wrote the characters according to their value, as in the examples above.

In order to expreſs any number of myriads, they made uſe of the letter M, placing above it the character repreſenting the number of myriads they intended to indicate.

| | | | | | |
|---|---|---|---|---|---|
| | α | β | γ | δ | |
| Thus | M, | M, | M, | M, | &c. |
| repreſented | 10,000, | 20,000, | 30,000, | 40,000. | |

| | | | |
|---|---|---|---|
| | λζ | δτοβ | |
| thus alſo | M | M | = 43720000, and |

generally, the letter M placed beneath any number, had the ſame effect as our affixing four ciphers. This is the notation employed by Eutocius in his Commentaries on Archimedes, but it is evidently not very applicable to calculations.

Diophantus and Pappus repreſented their myriads by the two letters Μ υ. placed after the number, and hence, according to them, the above numbers would be written thus: α . Μυ, β . Μυ, γ . Μυ, δ . Μυ, &c. 370,000 = λζ . Μυ, and 43720000 = δτοβ . Μυ.

Alſo 43728097 is expreſſed by δτοβ . Μυηιιζ

and 99999999 by ϡθιθ . Μυϡθιθ

This notation, in ſome meaſure, reſembles that which we employ for complex numbers, ſuch as feet and inches, or pounds and ſhillings.

The ſame authors, however, employed a ſtill more ſimple notation, by dropping the Μυ, and ſupplying its place with a point, thus,

inſtead of δτοβ . Μυηιιζ, they wrote δτοβ . ηιιζ;

and for ϡθιθ . Μυϡθιθ, they wrote ϡθιθ . ϡθιθ;

this laſt number, with the addition of unity, becomes $10{,}000^2 = 100{,}000{,}000$, which was the greateſt extent of the Greek arithmetic, and for common purpoſes it was quite ſufficient, becauſe their units of weight and meaſure, ſuch as the talent and ſtade, were greater than our pound and foot. It was, therefore, only aſtronomers and geometers who ſometimes found an inconvenience in this limitation; thus, for example, Archimedes in his "Arenarius," in order to expreſs the number of grains of ſand that might be contained in a ſphere that had for its diameter the diſtance of the fixed ſtars from the earth, found it neceſſary to repreſent a number which, with our notation, would require 64 places of figures; and in order to do this, he aſſumed the ſquare myriad, or 100,000,000, as a new unit, and the numbers formed with theſe new units he called numbers of the ſecond order, and thus he was enabled to expreſs any number which, in our notation, requires 16 figures: aſſuming, again, $(100{,}000{,}000)^2$ for a new unit, he could repreſent any number, that requires in our ſcale 24 figures, and ſo on; ſo that by means of his numbers of the 8th order, he could expreſs the number in queſtion, which, as we have ſaid above, required 64 figures in our ſcale.

Hence, according to Archimedes, all numbers were ſeparated into periods, or orders, of eight figures, which idea, as we are informed by Pappus, was conſiderably improved by Apollonius, who, inſtead of periods of eight places, and which were named by Archimedes octades, reduced to periods of four figures, the firſt of which, on the left, were units, the ſecond period myriads, the third double myriads, or numbers of the ſecond order, and ſo on indefinitely. In this manner Apollonius was able to write any number that can be expreſſed by our ſyſtem of numeration; as for example, if he had wiſhed to repreſent the circumference of a circle, whoſe diameter was a myriad of the 9th order, he would have written it thus:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| γ. | ϡυιε. | θσξε. | γφπθ. | ζϡλβ. | γωμς. | βχμγ. | γωλβ. | |
| 3. | 1415. | 9265. | 3589. | 7932. | 3846. | 2643. | 3832. | |
| | | | | ζϡ. | βωκδ. | | | |
| | | | | 7950. | 2824. | | | |

Having thus given an idea of the Grecian notation for integer numbers, it remains to ſay a few words on their method of repreſenting fractions. A ſmall daſh ſet on the right of a number,

number, made of that number the denominator of a fraction, of which unity was the numerator: thus,

$\gamma' = \frac{1}{3}$, $\delta' = \frac{1}{4}$, $\xi\delta' = \frac{1}{64}$, $\rho\kappa\alpha' = \frac{1}{121}$ &c. but the fraction $\frac{1}{2}$ had a particular character, as C, or $<$, or C′, or $'<$.

When the numerator is not unity, the denominator is placed as we fet our exponents.

Thus, $\iota\varepsilon^{\xi\delta}$, repreſented $15^{64}$, or $\frac{15}{64}$;

and $\zeta^{\rho\kappa\alpha}$, repreſented $7^{121}$, or $\frac{7}{121}$;

alſo $\sigma\xi\gamma \cdot \chi\phi\mu\delta^{\lambda\chi} \cdot \alpha\psi_{os} = 2633544^{331776} = \frac{2633544}{331776}$;

this laſt fraction is found in Diophantus, book iv. queſtion 46.

As it was only our intention, in this place, to convey to the reader a connected and general idea of the notation of the Greeks, in order the better to eſtimate the value of the modern, or, as it is ſometimes called, the Indian arithmetic, we have not entered into an explanation of their ſexageſimals, as employed by aſtronomers in the diviſion of the circle, and of which our's is ſtill a repreſentative, as is evident from the following example.

$o.\ \vartheta' \ \eta'' \ \iota\zeta''' \ \iota\chi^{\iota\nu} \ \iota\beta^{\nu} \ \lambda\alpha^{\nu\iota} = 0^\circ\ 59'\ 8''\ 17'''\ 13^{\iota\nu}\ 12^{\nu}\ 31^{\nu\iota}.$

All, therefore, that now remains for us to do, is, by a few examples, to throw ſome light upon the method that was employed in order to perform the common rules of arithmetic with this complicated ſyſtem of notation, referring the curious reader, who wiſhes for more particular information, to an ingenious eſſay on this head by Delambre, ſubjoined to the French tranſlation of the works of Archimedes, to which eſſay we are indebted for the foregoing and following extracts

*Example in Addition*.—From Eutocius, theorem 4 of the meaſure of the circle.

| | |
|---|---|
| $\omega\mu\zeta \cdot \gamma\text{M}\kappa\alpha$ | 847 3921 |
| $\xi \cdot \eta\upsilon$ | 60 8400 |
| $\text{M}\eta \cdot \phi\tau\kappa\alpha$ | 908 2321 |

In this example the method of proceeding is ſo obvious, that it needs no explanation, being performed exactly as we do our compound addition of feet and inches; or pounds, ſhillings, and pence; but it is more ſimple, on account of the conſtant ratio of 10 between any character and the ſucceeding one.

*Example in Subtraction*.—Eutocius, theorem 3 on the meaſure of the circle.

| | |
|---|---|
| $\theta \cdot \gamma\chi\lambda\varsigma$ | 9 3636 |
| $\beta \cdot \gamma\upsilon\ \theta$ | 2 3409 |
| $\zeta\ \ \sigma\kappa\zeta$ | 7 0227 |

This example alſo is ſo ſimple, that the reader will find no difficulty in following the operation, by proceeding from right to left, as in our ſubtraction, which method ſeems ſo obviouſly advantageous and ſimple, that one can hardly conceive why the Greeks ſhould ever proceed in the contrary way, though there are many inſtances which makes it evident that they did, both in addition and ſubtraction, work from left to right.

In multiplication, they moſt commonly proceeded in their operations from left to right, as we do in multiplication of algebra; and their ſucceſſive products were placed without much apparent order, as is evident from the following examples. But as each of their characters retained always their own proper value, in whatever order they ſtood, the only inconvenience of this was, that it rendered the addition of them together a little more troubleſome.

As it is burdenſome to the memory, to retain in mind the value of all the Greek characters, we have, for the eaſe of the reader, in the following examples, made the ſubſtitutions as below, by which means their operations will be the more readily comprehended.

For $\alpha\ \beta\ \gamma\ \delta$, &c. we write $1^\circ\ 2^\circ\ 3^\circ\ 4^\circ\ 5^\circ\ 6^\circ\ 7^\circ\ 8^\circ\ 9^\circ$
$\iota\ \kappa\ \lambda\ \mu$, &c. — $1'\ 2'\ 3'\ 4'\ 5'\ 6'\ 7'\ 8'\ 9'$
$\rho\ \sigma\ \tau\ \upsilon$, &c. — $1''\ 2''\ 3''\ 4''\ 5''\ 6''\ 7''\ 8''\ 9''$
$\alpha\ \beta\ \gamma\ \delta$, &c. — $1'''\ 2'''\ 3'''\ 4'''\ 5'''\ 6'''\ 7'''\ 8'''\ 9'''$

And the myriads are repreſented by $^{\text{m}}$, placed above the number of them.

Thus, $1^\circ\ 2^\circ\ 3^\circ$, &c. have their proper value.
$1'\ 2'\ 3'$, &c. will repreſent 10, 20, 30, &c.
$1''\ 2''\ 3''$, &c. — 100, 200, 300, &c.
$1'''\ 2'''\ 3'''$, &c. — 1000, 2000, 3000, &c.
$1^{\text{m}}\ 2^{\text{m}}\ 3^{\text{m}}$, &c. will be ſo many myriads.

After which, it will be extremely eaſy to follow the work in all the ſucceeding examples.

| | |
|---|---|
| $\rho\ \upsilon\ \gamma$ | $1''\ 5'\ 3$ |
| $\rho\ \upsilon\ \gamma$ | $1''\ 5'\ 3$ |
| $\alpha \cdot \varsigma\ \tau$ | $1^{\text{m}}\ 5'''\ 3''$ |
| $\varsigma\ \beta\ \phi\ \ \rho\ \upsilon$ | $5'''\ 2'''\ 5''\ 1''\ 5'$ |
| $\tau\ \rho\ \upsilon\ \theta$ | $3''\ 1''\ 5'\ 9^\circ$ |
| $\beta \cdot \gamma\ \upsilon\ \theta$ | $2^{\text{m}}\ 3'''\ 4''\ \ 9^\circ$ |

This example may be farther illuſtrated thus: by beginning on the left hand, we have,

$\rho \times \rho = \alpha$, or $100 \times 100 = 10000 = 1^{\text{m}}$
$\rho \times \upsilon = \varsigma$, or $100 \times 50 = 5000 = 5'''$
$\rho \times \gamma = \tau$, or $100 \times 3 = 300 = 3'''$

Again:

$\upsilon \times \rho = \varsigma$, or $50 \times 100 = 5000 = 5'''$
$\upsilon \times \upsilon = \beta\varsigma$, or $50 \times 500 = 2500 = 2'''\ 5''$
$\upsilon \times \gamma = \rho\upsilon$, or $50 \times 3 = 150 = 1''\ 5'$

Alſo:

$\gamma \times \rho = \tau$, or $3 \times 100 = 3''$
$\gamma \times \upsilon = \rho\upsilon$, or $3 \times 50 = 1''\ 5'$
$\gamma \times \gamma = \theta$, or $3 \times 3 = 9^\circ$

Whence by addition we have evidently $2^{\text{m}}\ 3'''\ 4''\ \ 9^\circ$

The above example is exactly copied from Eutocius, and is ſufficient to indicate the method that the Greeks employed in their multiplication; but it will not be amiſs to preſent

preſent the reader with another example, drawn from the ſame ſource.

| | |
|---|---|
| φ o α | 5″ 7′ 1° |
| φ o α | 5″ 7′ 1° |
| κ ε γ ξ φ | 25ᵐ 3ᵐ 5‴ 5″ |
| M M | |
| γ ξ ϡ ϡ o | 3ᵐ 5‴ 4‴ 9″ 7′ |
| M | |
| φ o α | 5″ 7′ 1° |
| λ β ς μ α | 32ᵐ 6‴ 4′ 1° |
| M | |

The diviſion of the Greeks was ſtill more intricate than their multiplication: for which reaſon, it ſeems they generally preferred the ſexageſimal diviſion; and no example is left at length, by any of thoſe writers, except in the latter form. But theſe are ſufficient to throw ſome light on the proceſs they followed, in the diviſion of common numbers; and Delambre has accordingly ſuppoſed the following example.

*Example in Diviſion.*

) τ λ β . γ τ κ θ ( φ ω κ γ

ρ π β . γ

φ ω κ γ

ρ υ . τ κ θ

ρ μ ε . η υ

ϡ . φ ϡ κ θ

γ . ς υ ξ

ε υ ξ θ

ε υ ξ θ

332ᵐ 3‴ 3″ 2′ 9° ( 1‴ 8″ 2′ 3°

182 3

1‴ 8″ 2′ 3°

150 0 3 2 9

145 8 4

4 1 9 2 9

3 6 4 6

5 4 6 9

5 4 6 9

This example will be found, on a ſlight inſpection, to reſemble our compound diviſion, or that ſort of diviſion that we muſt neceſſarily employ, if we were to divide feet, inches, and parts, by ſimilar denominations; which, together with the number of different characters that they made uſe of, muſt have rendered this rule extremely laborious: and that for the extraction of the ſquare root was of courſe equally difficult, the principle of which was the ſame as our's, except in the difference of the notation; though it appears that they frequently, inſtead of making uſe of the rule, found the root by ſucceſſive trials, and then ſquared it, in order to prove the truth of their aſſumption.

From the foregoing ſketch of the notation and arithmetic of the Greeks, the reader will be able to form ſome eſtimate of the value and importance of the preſent ſyſtem, which does perhaps more honour to its inventor than any other diſcovery in the whole circle of the ſciences, being that to which we muſt conſider ourſelves indebted for the many brilliant advances that have been ſubſequently made in the modern analyſis and aſtronomy. Let any one compare the complicated multiplications of the ancients with the logarithmic operations of the moderns, and he will ſoon be convinced, that he cannot ſet too high a value upon the diſcovery of our preſent ſyſtem of arithmetic, which laid the foundation of that of logarithms, and many other of the moſt important improvements that have been made for facilitating calculation, and thereby extending the bounds of ſcience to their utmoſt poſſible limits. He will alſo perceive how ſlow and progreſſive are the ſteps to knowledge, and by what imperceptible degrees we arrive towards perfection. From the firſt rude efforts of the Greeks, when their notation carried them no farther than to write down 10,000, or a myriad, he will be able to trace them through their ſeveral ſucceſſive improvements, until it became indefinite, like our own: firſt, by placing the character M under the number of myriads that they wiſhed to repreſent, they extended it to $10{,}000^2$, or 100,000,000; but this poſition of the character being found inconvenient, was changed for Mυ, following the number it was before placed under; and this, again, was afterwards dropped for the more eligible form of a point, ſeparating the myriads from the ſimple units. Afterwards, Archimedes invented his octades, or periods of eights, and thus gave an indefinite extent to the Grecian arithmetic; an idea that was conſiderably improved by Apollonius, by making the periods to conſiſt of only four places, inſtead of eight, and dividing all numbers into orders of myriads; in doing which, it is moſt extraordinary that he did not perceive the advantage of making the periods conſiſt of a leſs number of characters: for having by this means given a local value to his periods of four, it was only neceſſary to have done the ſame for the ſingle digits, in order to have arrived at the ſyſtem in preſent uſe: and this overſight is the more ſingular, as the cypher was not unknown to the Greeks, being always employed by them in their ſexageſimal operations, where it was neceſſary; and, conſequently, the ſtep between this improved ſtate of their notation and that of the preſent ſyſtem was extremely ſmall, although the advantages of the latter, compared with the former, were incalculably great. Barlow's Theory of Numbers.

NOTATION, in *Algebra*, is the repreſenting of quantities by letters of the alphabet; or calling them by thoſe names. See QUANTITY, CHARACTER, &c.

NOTATION, in *Muſic*. See NOTES.

NOTCH, *The*, in *Geography*, a paſs on the weſtern part of the White mountains, in New Hampſhire, America.

NOTCH, *Cape*, the weſt point of Goodluck bay, in the ſtraits of Magellan. S. lat. 53° 33′. W. long. 74° 34′.

NOTCHENGONG, a town of Hindooſtan, in the country of Berar; 47 miles S.S.W. of Nagpour; 75 miles S.W. of Ellichpour. N. lat. 20° 32′. E. long. 79° 17′.

NOTE, NOTA, is uſed for a character, or abbreviature, ſerving to denote or expreſs ſomething in a little compaſs.

The ancient notaries wrote all in notes, or ſhort-hand; whence they were ſometimes denominated *curſores*, *quia notis curſim verba expediebant*.

NOTES, ſigns or characters uſed to expreſs the tone and time of each ſound in writing muſic. For the twenty-four letters of the Greek alphabet, uſed for muſical characters, or ſymbols of ſound, ſee GREEK *Muſic*.

Dr. Pepuſch aſſerts roundly, and without the leaſt modification of doubt, or even condeſcendiug to allege a ſingle reaſon

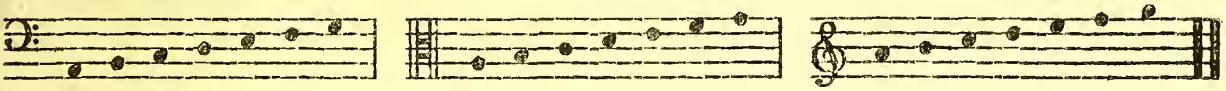
reaſon or proof in defence of his opinion, that "it was uſual among the Greeks to conſider a *deſcending* as well as an *aſcending* ſcale; the former proceeding from acute to grave, preciſely by the ſame intervals as the latter did from grave to acute. The firſt ſound of each was the *Proſlambanomenos*. Phil. Tranſ. Martin's Abridgment, vol. x. part i. p. 261.

No inſtances of theſe inverted ſcales are to be found, however, in Ariſtoxenus, Euclid, or any of the oldeſt and beſt writers. Boethius, Bryennius, and ſome other of the more modern compilers, have indeed puzzled the cauſe by ambiguous expreſſions, which ſeem to bear ſuch conſtruction. This perplexity concerning the ſcale, if not cleared up, would injure the few fragments left of Greek muſic, by a miſtake in this particular, as much as a poem by reading it backwards.

With reſpect to the firſt forms of modern notation, which ſucceeded points, it is not difficult to deduce them wholly from the black ſquare note, called a *breve*, the firſt and almoſt only note uſed in canto fermo; which, with a foot or tail to it, is a *long*, and if doubled in breadth, a *large*. The ſquare note alſo placed on one of its angles, differs very little from the rhombus or lozenge, and with a tail placed at its loweſt angle, when *open*, becomes a minim, and, when *full*, a crotchet.

Rouſſeau ſays, and others have ſaid before him, that the Latins had eaſed themſelves of all theſe difficulties of notation, and that Boethius eſtabliſhed the uſe of fifteen letters only, for notation; but he does not tell us where, in what book or chapter, of his treatiſe De Muſica, this reform is to be found. Boethius was only a compiler and tranſlator from the Greek, and never ſeems to propoſe a new ſyſtem or new doctrines. But it is more true, and better aſcertained, that pope Gregory, in arranging and regulating the eccleſiaſtical chants, finding that the intervals of the ſecond octave of the ſcale were, in effect, the ſame as the firſt, and that the order was the ſame in the upper and lower octave of the ſyſtem; reduced the notes to the *ſeptem diſcriminata vocum*, as the ancient Romans had done in the time of Horace and Virgil; and theſe notes, expreſſed by the firſt ſeven letters of the alphabet, were repeated in a different ſized literal character, from octave to octave, the graveſt of which he expreſſed by capitals, the mean by minuſcules, and the higheſt by double letters, thus: which in modern notes would conſtitute the following ſcale.

A B C D E F G a b c d e f g aa bb cc dd ee ff gg



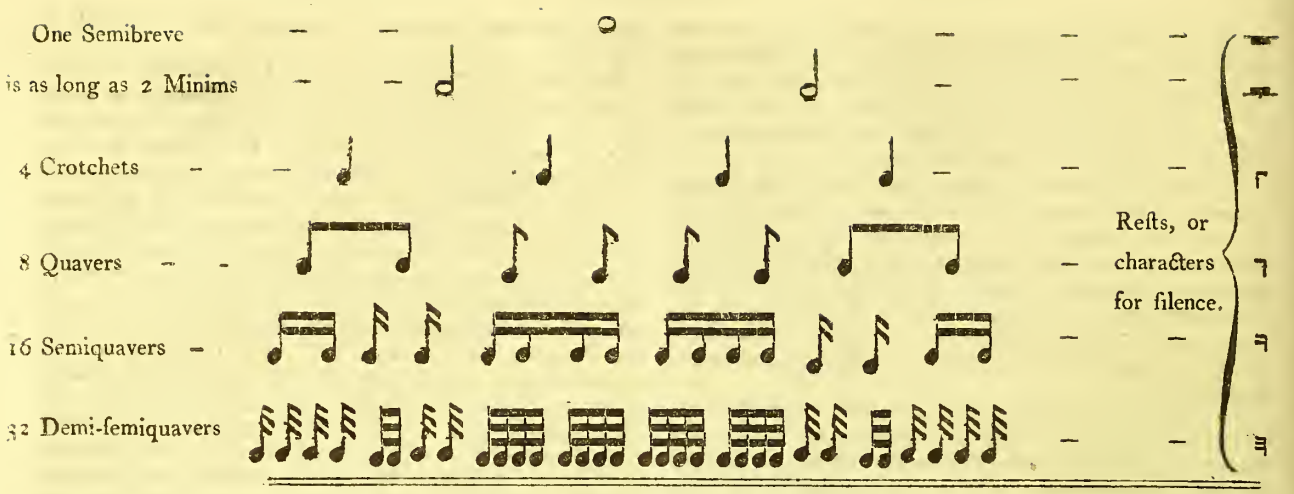
And theſe letters are ſtill retained in moſt parts of Europe, as *denominations* of muſical ſounds, though a different entablature and notation is uſed in practice. At length Guido, a Benedictine monk of Arezzo, in Tuſcany, ſubſtituted to theſe letters points, placed on different parallel lines, to each of which a letter ſerved as a clef or key. Theſe points were afterwards enlarged, and placed in the ſpaces between the lines; and, at length, theſe lines and ſpaces were multiplied as occaſion required. (See STAFF and GAMMUT.) Menage, in his "Origine de la Langue Françoiſe," gives the following derivation of the word *gammut*. "Guido Aretinus, a Benedictine monk, who had been employed to correct the eccleſiaſtical chants, about the year 1024, compoſed a ſcale, conformable to the Greek ſyſtem, adding to it a few ſounds above and below. And diſcovering afterwards that the firſt ſyllable of each hemiſtich in the hymn to St. John the Baptiſt, written by Paul Diaconus, who lived about the year 774, formed a regular ſeries of ſix ſounds aſcending,

Ut, re, mi, fa, ſol, la.

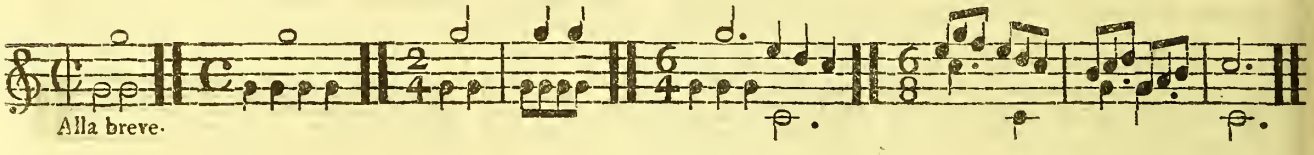
he placed at the ſide of each of theſe ſyllables one of the firſt ſeven letters of the alphabet, A, B, C, D, E, F, G, and becauſe he accompanied the note which he added below the ancient ſyſtem with the letter *gamma*, the whole ſcale was called *gammut*, a name by which it is diſtinguiſhed to this day."

For a long time the points, letters, and ſyllables which ſerved as notes, were of no other uſe than to mark the degrees of gravity and acuteneſs, and fix the intonation. As to duration, they were all equal, with no other difference, than that of long and ſhort ſyllables, uſed in chanting. Canto fermo ſtill remains nearly in the ſame ſtate to this day in the Roman Catholic churches. And the muſic of the metrical pſalms, with the Proteſtants, is ſtill more imperfect; ſince in the performance of them no diſtinction is made even in long and ſhort ſyllables, or of ſemibreves and minims, though their figure has been preſerved.

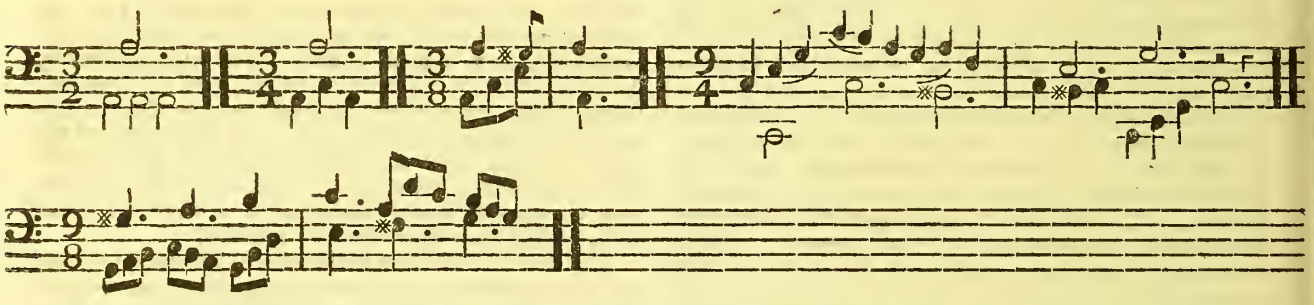
This want of diſtinction in the time of notes and their value, as to duration, is generally ſuppoſed to have continued till about the year 1338, when John de Muris is ſaid to have invented figures to expreſs different durations of ſound, and to have formed a time-table. His claim to this invention is conſidered in his biographical article. (See alſo CHARACTERS and TIME-TABLE.) In the firſt tables that were found, the notes were all black; then full and void, mixed; and laſtly, all white, as far as the minim. The complete time-table does not ſeem finiſhed till the end of the 16th century. Morley's characters in his table begin with the *maxima*, or large, and go no farther than the ſemiquaver. The modes or characters placed at the beginning of a movement, to mark the time and relative proportion of notes, are likewiſe aſcribed to John de Muris. All the notes now in uſe in ſecular muſic, are contained in the following table.




COMMON TIME, or DUAL MEASURE.




TRIPLE TIME.



NOTE, *Senſible*, Fr. is the half note below the key-note, and a ſharp third above the fifth, or dominant. There is no term in the French muſical technica ſo expreſſive as this; it deſcribes the ſenſations of every diſcriminative ear, and the eagerneſs which it excites to move to the key-note, particularly if the fifth is accompanied with the ſeventh. Almoſt every accidental ſharp in the courſe of modulation is a *note ſenſible*, leading to a new key. B is the note ſenſible of the key of C, and G that of A.

NOTE is alſo uſed for a mark made in a book or writing, where there occurs ſomething remarkable, and worthy of particular notice.

NOTE is alſo uſed for an obſervation, or explication of ſome paſſage in an author, added in the margin, at the bottom of the page, or elſewhere, by an editor.

In this ſenſe, note ſtands contradiſtinguiſhed to text.

The notes make the principal difference in the editions of claſſic, &c. authors. We have Virgil, Horace, Terence, &c. with Ruæus's notes, the Dauphin's notes, Dacier's notes, Bentley's notes, Hare's notes, with *notis variorum*, &c.

NOTE is alſo a minute, or ſhort writing containing ſome article of buſineſs.

In which ſenſe we ſay, a *promiſſory note*, a *note under hand*, a *bank note*, &c.

Bank notes are made payable to bearer on demand; in which reſpect they differ from poſt-bills, which are payable to order at ſeven days ſight.

By 3 & 4 Ann. cap. 9, all notes ſigned by any perſons, and whereby ſuch perſons ſhall promiſe to pay to any other perſon, or order, &c. any ſum of money, the money mentioned in ſuch note ſhall be due, and payable to the perſon to whom made, and the note ſhall be aſſignable over as inland bills of exchange; whereupon the perſon to whom ſuch note is payable, or aſſigned, may maintain an action for the ſame againſt the perſon who ſigned, or any who indorſed the note, as in the caſes of inland bills, and recover damages and coſts of ſuit, &c. If the party, on whom any inland bill of exchange ſhall be drawn, refuſes to accept it by underwriting it under his hand, the perſon to whom payable is to cauſe ſuch bill to be proteſted, as foreign bills; but no acceptance ſhall charge any perſon, unleſs bills be underwritten or indorſed; and if it be not underwritten or indorſed, no drawer ſhall be obliged to pay coſts, damages, or intereſt thereon, unleſs proteſt be made for non-acceptance, and within fourteen days after the ſame be ſent, or notice thereof given to the party from whom the bill is received, or left in writing at his uſual place of reſidence. The bill being accepted, and not paid within three days after due, proteſt muſt be made, in writing, under a copy

of the bill, by ſome notary public; or, if no ſuch notary be reſident in the place, then by any other ſubſtantial inhabitant, in the preſence of two credible witneſſes, and notice given as aforeſaid, to charge the drawer, &c. Though no proteſt ſhall be neceſſary, except the value ſhall be expreſſed to be received in ſuch bill, and the bill be drawn for 20*l.* at leaſt. There is a proviſo in the act, that nothing therein ſhall diſcharge any remedy any perſon may have againſt the drawer, acceptor, or indorſer of any bill.

What has been ſaid of bills of exchange is applicable alſo to promiſſory notes, that are indorſed over and negociated from one hand to another; only that, in this caſe, as there is no drawer, there can be no proteſt for non-acceptance; or rather, the law conſiders a promiſſory note in the light of a bill drawn by a man upon himſelf, and accepted at the time of drawing: and, in caſe of non-payment by the drawer, the ſeveral indorſers of a promiſſory note have the ſame remedy, as upon bills of exchange, againſt the prior indorſers. See BILL *of Exchange*.

Stealing of notes, bills of exchange, &c. is felony, in the ſame degree as if the offender had robbed the owner of ſo much money, &c.; and the forging notes for money, bills of exchange, indorſements, &c. is felony, by ſtat. 2 Geo. II. cap. 25. See FELONY.

*To* NOTE *a Bill*, is when a public notary goes as a witneſs, or takes notice, that a merchant will not accept or pay it. See PROTEST.

NOTE *of a Fine*, is a brief of a fine made by the chirographer, before it be ingroſſed. Or, it is an abſtract of the writ of covenant and the concord; naming the parties, the parcels of land, and the agreement. This muſt be enrolled of record in the proper office, by 5 Hen. IV. cap. 14.

NOTEBACH, in *Geography*, a town of Sweden, in the province of Smaland; 43 miles N.W. of Calmar.

NOTELÆA, in *Botany*, ſo named by the late M. Ventenat, from νοτος, *the ſouth*, and ελαια, *an olive*, or *olive tree*, alluding to the affinity of the ſhrubs which compoſe this genus, and which are natives of the ſouthern hemiſphere, to the Olive of the ancient world. Indeed this affinity is ſo cloſe, that we much doubt whether they ought to be ſeparated. Even Mr. Brown, ſo acute in diſcerning, and ſo prone, in many caſes, to eſtabliſh generic differences, though he has adopted *Notelæa*, ſeems inclined to think it might be united with *Chionanthus* and *Olea*, as well as *Phillyrea*; which laſt he has, like Mr. Saliſbury, poſitively reduced to *Olea*. Ventenat. Choix de Plantes, 25. Brown. Prod. Nov. Holl. v. 1. 523. Ait. Hort. Kew. ed. 2. v. 1. 22. (Rhyſoſpermum; Gærtn. fil. t. 224.)—Claſs and order, *Diandria Monogynia*. Nat. Ord. *Sepiariæ*, Linn. *Jaſmineæ*, Juſſ. *Oleinæ*, Br.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, ſmall, tubular, four-cleft, permanent. *Cor.* of four ovate concave petals, combined in pairs by their baſe through the medium of the ſtamens, longer than the calyx. *Stam.* Filaments two, oppoſite, awl-ſhaped, ſhort, each united with the baſes of the two oppoſite pairs of petals, alternate with each petal; anthers erect, of two cells, burſting lengthwiſe. *Piſt.* Germen roundiſh, ſuperior, of two cells; ſtyle ſimple, very ſhort; ſtigma obtuſe, ſimple or cloven. *Peric.* Drupa with a ſomewhat membranous ſkin. *Seed.* Nut ſolitary, of one cell.

Eſſ. Ch. Corolla of four petals, combined in pairs by the ſtamens. Drupa oval.

1. N. *longifolia*. Long-leaved New Holland Olive. Br. n. 1. Ait. n. 1. Venten. Choix. t. 25. (Olea apetala; Andr. Repoſ. t. 216; but not of Vahl or Willdenow.)—Leaves lanceolate, reticulated with veins on both ſides; more or leſs downy, without dots, beneath. Segments of the calyx unequal. Stigma divided.—Native of Port Jackſon, New South Wales, from whence it was procured for Kew garden, by Sir J. Banks, in 1790. It is kept in the greenhouſe, and flowers from March to July. The *ſtem* is ſhrubby, with numerous, round, *branches*, downy when young. *Leaves* oppoſite, rigid, lanceolate, entire, often wavy, tapering at each end, various in breadth, from three to ſix inches long, veiny; clothed with fine ſoft down, for the moſt part, on the under ſide; roughiſh, rarely downy, above. *Footſtalks* ſhort and thick. *Cluſters* axillary, ſolitary, ſimple, about an inch long when in flower, afterwards much more; ſometimes crowded about the ends of the branches with fewer or ſmaller leaves. *Petals* yellowiſh-white. *Stigma* deeply divided and divaricated. *Fruit* about half an inch long. The true *Olea apetala*, found by Sir J. Banks in New Zealand, is a very different plant, with ſmooth elliptical *leaves*, curved at the point, and *flowers* really deſtitute of a *corolla*.

2. N. *punctata*. Dotted-leaved New Holland Olive. Br. n. 2.—"Leaves lanceolate, tapering at the baſe; veiny above; ſmooth and very thickly dotted, with obſolete veins, beneath."—Gathered by Mr. Brown in the tropical part of New Holland.

3. N. *ovata*. Ovate New Holland Olive. Br. n. 3.—"Leaves ovate, ſmooth, without dots. Segments of the calyx equal. Stigma ſeſſile, undivided."—Gathered by Mr. Brown near Port Jackſon. We obtained from Kew garden, in 1798, a ſpecimen which anſwers to this character, but no ſuch ſpecies occurs in Mr. Aiton's work. Our plant has *leaves* three or four inches long, and above one broad, entire, acute at each end, coriaceous, ſmooth, the tranſverſe veins moſt viſible beneath. *Cluſters* axillary, of but few, and rather large, white *flowers*, each cluſter about an inch long, or equal to the *footſtalks*. *Bracteas* half an inch long, ovate, concave, fringed. *Stalks* ſmooth.

4. N. *liguſtrina*. Privet-leaved New Holland Olive. Br. n. 4. Ait. n. 2. Vent. Choix, under p. 25.—"Leaves lanceolate, narrow, elongated, ſtalked, very ſmooth; ſimple in the margin; dotted beneath; veins obſolete on both ſides."—Native of Van Diemen's land. Sent to Kew by P. G. King Eſq. in 1807. It is kept in the greenhouſe, flowering in July and Auguſt.

5. N. *microcarpa*. Small-fruited New Holland Olive. Br. n. 5.—"Leaves linear-lanceolate, elongated, tapering at the baſe, nearly ſeſſile, very ſmooth; ſlightly dotted beneath; manifeſtly veiny above."—Native of the tropical part of New Holland. *Drupa* leſs than a pea; in the preceding larger.

NOTHÆ COSTÆ, in *Anatomy*, a term under which the falſe ribs are ſometimes deſcribed.

NOTHING, *Nihil*, *nihilum*, or *non ens*.

The ſchoolmen diſtinguiſh between nothing taken ſtrictly, which is what is impoſſible, or implies a contradiction; and nothing taken more generally, which is both applied to what is poſſible and impoſſible.

Again, they diſtinguiſh nothing into *negative*, which is the abſence of reality in any ſubject; and *privative*, which is the abſence of reality in a ſubject capable thereof, or wherein it ought to be found.

NOTHOLÆNA, in *Botany*, ſo called by Mr. R. Brown, as we preſume, from νοθος, *ſpurious*, and λαινος, *wool*; becauſe there is no involucrum, but in its ſtead the briſtly, ſcaly, or woolly covering of the frond affords a ſort of ſpurious protection to the fructification. Brown Prodr.

Nov. Holl. v. 1. 145.—Claſs and order, *Cryptogamia Filices;* ſect. *Annulatæ*. Nat. Ord. *Filices*.

Eſſ. Ch. Capſules in a marginal line, either continued or interrupted. Involucrum none; (except the briſtles, ſcales, or woollineſs of the frond, ſeparating the capſules.)

This genus is formed, by the learned writer above mentioned, out of ſome ſpecies hitherto ſuppoſed to belong either to *Acroſtichum*, *Pteris*, or Swartz's *Cheilanthes*, with which they ſeverally agree in habit.

1. N. *Marantæ*. (Acroſtichum Marantæ; Linn. Sp. Pl. 1527. Swartz. Fil. 14. Lonchitis aſpera Maranthæ; Camer. Epit. 666.)—Frond doubly pinnate, lanceolate; covered beneath with linear tawny ſcales. Branches oblong, rather cloſe. Leaflets oblong, obtuſe; the lowermoſt dilated, and ſomewhat lobed, at the baſe; uppermoſt confluent.—Native of Italy, Switzerland, and the Levant, in the cleſts of rocks. This is a beautiful *fern*, about a foot high, with a long, brown, zigzag, rough and hairy *ſtalk*. The leafy part is from three to ſix inches long, and near two in breadth, ſmooth, and of a deep, ſomewhat glaucous, green, above; covered beneath with long, pointed, imbricated ſcales, of a rich golden brown. The tufted *roots* are covered with long tawny ſlender briſtles.

2. N. *diſtans*. Br. n. 1.—Frond doubly pinnate, linear-lanceolate, very rough with briſtly ſcales. Branches oppoſite, diſtant, ſomewhat deltoid. Leaflets oblong, obtuſe; the lower ones pinnatifid. Stalk briſtly throughout.—Native of Port Jackſon, New South Wales. We received it from Dr. White. The *frond* is much more linear than in the foregoing; its primary diviſions more diſtant. The colour of the *ſcales* is a rather pale brown, without any of the golden tawny hue, ſo remarkable in the firſt ſpecies.

3. N. *vellea*. Br. n. 2.—"Frond doubly pinnate, of a narrow triangular figure, hoary with entangled down. Branches nearly oppoſite. Leaflets oblong, obtuſe; the lower ones cut. Stalk woolly throughout."—Gathered by Mr. Brown in the tropical part of New Holland.

4. N. *trichomanoides*. (Pteris trichomanoides; Linn. Sp. Pl. 1532 Swartz. Fil. 102. Trichomanes argenteum, ad oras nigrum; Plum. Fil. 57. t. 75. Pet. Fil. n. 137. t. 9. f. 16. T. majus, pinnis finuatis ſubtùs niveis; Sloane Jam. v. 1. 80. t. 35. f. 1.)—Frond pinnate, linear. Leaflets numerous, ſomewhat ovate, obtuſe; lobed at the baſe; powdery and often hairy beneath.—Native of Jamaica and Hſpaniola. Plumier ſays it grows on all ſorts of ſoil, whether dry or moiſt, on rocks and in woods. Numerous *fronds*, from ſix to twelve inches high, ariſe from the tufted *root*, and are of a linear figure, ſcarcely an inch wide, compoſed of very numerous, moſtly alternate, ſtalked *leaflets*, one-third or one-half of an inch long, broadiſh-ovate, a little oblique, obtuſe, with more or leſs of a roundiſh ſhallow lobe at their baſe. Their margin is fringed with a denſe row of tufted, or ſtellate, brown hairs, within which, but cloſe to it, runs a nearly ſimple line of annulated *capſules*. The upper ſide of each *leaflet* is ſmooth, or very ſlightly hairy; the under covered, as if white-waſhed, with a denſe opaque white powder, occaſionally leaving the dark poliſhed midrib viſible, and moſtly beſprinkled with a few hairs. The Linnæan ſpecimen is remarkable for a denſe hairy covering on the under ſide, concealing or obliterating this whiteneſs; yet it ſeems but a caſual variation.

5. N. *Pumilio*. Br. n. 3.—"Frond pinnate, ſmooth. Leaflets from three to ſeven, oval, nearly entire, ſlightly recurved at the margin."—Gathered by Sir Joſeph Banks, in the tropical part of New Holland.



NOTHUS, νοθος, a Latin term, properly ſignifying a *baſtard*, or a perſon of ſpurious birth.

Hence it is applied figuratively, by phyſicians, &c. to ſuch diſeaſes, as, though, in reſpect of a ſimilitude of ſymptoms, &c. they have the ſame denomination as ſome others; yet are of a different origin, ſeat, or the like, from the ſame.

Nothus is ſometimes alſo uſed for the back part of the cheſt, or thorax.

NOTIOMETER. See Hygrometer.

NOTION, Notio, in *Logic*, an idea or repreſentation of any thing in the mind.

This term and the word idea are often taken in the ſame ſenſe; but an ingenious author obſerves, that we cannot ſtrictly be ſaid to have an idea of an active being, or of an action, although we may be ſaid to have a notion of them. I have ſome knowledge, or notion, of my mind, and its acts about ideas, inaſmuch as I know, or underſtand what is meant by thoſe words. What I know, that I have ſome notion of.

However, the terms idea and notion may be uſed convertibly. But yet it conduces to clearneſs and propriety, that we diſtinguiſh things very different by different names. It is alſo to be remarked, that all relations including an act of the mind, we cannot ſo properly be ſaid to have an idea, but rather a notion of the relations or habitudes between things; but, if in the modern way, the word idea is extended to ſpirits, relations, and acts, this is, after all, an affair of verbal concern.—Berkeley, Princip. of Hum. Knowl. ſect. 142. p. 160, 161. See Idea.

M. Leibnitz is very accurate in the diſtinction of notions, in the Acta Erud. Leipſ. anno 1684.

Notion, *A clear*, he defines to be ſuch an one as ſuffices us to recollect the object; *v. g.* that a given figure is reckoned in the number of triangles.

Notion, *An obſcure*, is that which doth not ſuffice to recollect the object, ſuch, *v. g.* is that of a plant, which upon ſeeing, you are in a doubt whether or no it be the ſame you had ſeen elſewhere, and which is called by this or that name.

Notion, *Diſtinct*. See Distinct.

Notion, *A confuſed*, is that wherein you are not able to aſſign the very marks or characters whereby you recollect the object, though it be reſolvable into them. Such, *v. g.* is the notion of red colour.

Notion, *Abundant*. See Abundant.

Notion, *An adequate*. See Adequate.

Notion, *An inadequate*, that wherein you have only a confuſed notion of characters that enter a diſtinct one.

Some confuſed notions are admitted into mathematics; *viz.* ſuch whoſe reſolution is of no great conſequence to any demonſtrations.

Thus, Euclid does not reſolve the notion of equality, though it enter the notion of an equilateral triangle, a rhombus, &c. inaſmuch as the propoſitions, for whoſe demonſtration it ſhould be uſed, are eaſily granted, without ſuch a detail: as *v. g.* that things equal to the ſame third are equal to one another, &c. but no notions are admitted into the number of mathematical definitions, except diſtinct ones, and thoſe too as adequate as poſſible, or as occaſion requires.

The ſchoolmen diſtinguiſh notions into *formal*, and *objective;* and each of theſe they ſubdivide into *firſt* and *ſecond*.

Notion, *A firſt formal*, is the knowledge we have of any thing according to what it is, or has in itſelf; as the knowledge of fire, *quatenus* fire; of a light body, *quatenus* light, &c.

NOTION, *A first objective*, is the thing itself known, according to what it is, or has in itself; as the fire known as fire, &c.

NOTION, *Second formal*, is the knowledge of a thing according to what it receives from the understanding: as, of fire, that it is the subject, and not the predicate.

NOTION, *Second objective*, is what agrees to the thing by means of the operation of the intellect, or what it receives from the intellect.

NOTIONS, *Common*, called also *prenotions*, προλήψεις, and κοιναι ἐννοιαι, are certain principles supposed by some writers to be innate, and which therefore are self-evident, *i. e.* appear, or are known by their own light, without the intervention of any medium or proof; being impressed, as it were, by the finger of God, to serve as the foundations of all our conclusions in the sciences, which are to be demonstrated hereby.

These *common* notions, considered as the foundations of sciences, are called *axioms*.

They are called *common*, not as if so actually and necessarily perceived by every person, that nobody could be ignorant of, or deny them; but because they are judged to be true and certain, by all persons of sound reason.

For the same reason as we say, such a food is wholesome; not that it is so to all men, but to all that are of a sound body and constitution. Aristot. Topic. c. 4.

There are two kinds of *common* notions, *viz. theoretical*, which lay the ground-work for speculation; such are, every thing either is, or is not; nothing can be made by itself; the whole is greater than a part; equal things being added to equal, the sums are equal: and *practical*, which lay the foundation for honesty, and good morals; such are, God is to be beloved, and worshipped; our parents to be honoured; to give every body their due; to do as we would be done by.

Some philosophers, however, and those even of best note, deny the reality of any innate, or common notions; urging, that the mind does not need any actual notions, to prepare it to think, but that an innate faculty of thinking may suffice; as appears in an infant, from its perception of pain, taste, colour, &c. They add, that the common organs of sense, if they have but objects presented to them, and the faculty we have of reflecting on, and variously combining or ordering, the ideas received thereby, are sufficient to furnish us with all the stock of knowledge we have. See IDEA and *Common* SENSE.

NOTIONAL QUANTITY. See QUANTITY.

NOTITIA, NOTICE, something that has come under a person's knowledge or observation.

Hence *notification*, the action of giving notice, &c.

NOTITIA is also the title of certain books, composed for giving a particular knowledge of the places, roads, &c. of a province, kingdom, diocese, or the like.

Such is the Notitia Imperii, &c. M. Valois has given a Notitia Galliarum, being a collection of the several names which the cities and provinces of that kingdom bore at different times.

The Notitiæ Dignitatum Imperii, both eastern and western, are of the utmost use both in the Roman and in ecclesiastical history; yet they are of little service, at least to young people, without good notes; such are those of Pancirollus, &c. and unless the text, which is strangely corrupted and mutilated, be supplied.

NOTKER, or NOTGER, in *Biography*, surnamed the *Stammerer*, a celebrated monk of the abbey of St. Gall, who flourished in the ninth and tenth centuries, was descended from a noble family, and born within a short distance of that abbey, towards the close of the reign of Lewis le Debonnaire. He received his education at the monastery of St. Gall, and took the religious habit among the Benedictines on that foundation; he became distinguished by the progress which he made in sacred and profane literature, and acquired an extraordinary fame for sanctity. During the course of several years he had the conduct of the schools dependent on the abbey, and occupied his hours of leisure in the composition of literary works, and the transcription of books of merit. He died at an advanced age, in the year 912. He was beatified by pope Julius II. There are still extant by him "A Martyrology," in Basnage's "Thesaurus Monumentorum Ecclesiasticorum et Historicorum:" some other of his productions may be seen in the "Novus Thesaurus Monumentorum" of D. Pez. Moreri.

NOTKER, or NOTGER, a celebrated bishop of Liege in the tenth and eleventh centuries, a native of Suabia, was said to be the son of a duke of that country, though others affirm that he was nephew of Otho I. He became a monk of the abbey of St. Gall, and was entrusted with the superintendance of the schools belonging to that religious foundation. After this he was elected provost or prior of the abbey, and frequently attended at the imperial court, where he became a favourite of Otho I., who, in 971, appointed him to the high dignity of bishop of Liege. Scarcely was he settled in his see, when he devised measures for improving the city, by surrounding it with a wall, rebuilding the cathedral and several of the other churches, and erecting various magnificent structures, so that he obtained the title of "founder of the city." He was also a great encourager of the learning and science of those times, and sustained a considerable part in the management of public affairs. He was present at the council of Mousson in the year 995, and at that of Frankfort in 1007. He died in the year 1008. To him has been attributed "A History of the Bishops of Liege," which is inserted in Chapeauville's Collection of Pieces relating to the History of the City. Moreri.

NOTO, in *Geography*, a town of Sweden, in the province of Smaland; 39 miles S.W. of Wexio.

NOTO, *Valley of*, a division of Sicily, in the S.E. part of the island.

NOTO, or *Noto Nuova*, a town of Sicily, in the above mentioned valley, built after the destruction of Noto Antico by an earthquake in the year 1693; 20 miles S.W. of Syracuse. N. lat. 36° 48′. E. long. 15°.

NOTO, a lake of Russia, in the government of Archangel, about 36 miles in length, and 8 in breadth; 36 miles S.W. of Kola.—Also, a small island in the Baltic, E. of Aland. N. lat. 59° 58′. E. long. 20° 17′.—Also, a town of Japan, in the island of Niphon; 200 miles N.W. of Jedo.

NOTONECTA, the Boat-fly, in *Entomology*, a genus of insects of the order Hemiptera: the generic character is as follows; snout inflected; antennæ shorter than the thorax; it has four wings, folded crosswise; on the upper half it is coriaceous; the hind legs are hairy and formed for swimming.

The insects of this genus, like those of the *Nepa* (which see), live in stagnant waters, and prey on aquatic animalcula: the larvæ and pupæ are six-footed and active; the former have the rudiments of wings, the others have none. There are seventeen species, arranged in two sections, *viz.* A, the insects of which have the lip elongated, conic; and B, of which the insects are distinguished by a conic sheath, spinous at the sides. In the former division there are thirteen species,

ſpecies, in the latter only four, which comprize the Sigara of Fabricius.

A. *Lip elongated, conic.*

Species.

GLAUCA. Upper wings yellow-brown, the anterior margin bright brown dotted with black, the tip bifid. It is found in this country and ſome other parts of Europe. It is particularly deſcribed in Donovan's Inſects. It is very common upon ſtagnant water; the head is round, and for the greateſt part occupied by two brown eyes; the antennæ are very ſmall, of a yellow colour, and inſerted in the under part of the head; the elytra or ſheaths are of a ruſty clouded colour, large, and croſſed one over the other.

FURCATA. Upper wings brown, with two teſtaceous ſpots at the baſe. It is very like the laſt, and is found in France.

MACULATA. Upper wings brown, with ferruginous ſpecks; they are bifid at the tip; it is leſs than the others, and is alſo found in France.

AMERICANA. This is of a greyiſh colour, but black behind; the ſcutel is of a deep black, with a yellow dot each ſide at the baſe. It is, as its name imports, an American inſect.

NIVEA. Upper wings whitiſh, immaculate, rounded at the tip. Inhabits India, and is four times as ſmall as the Glauca.

* MINUTISSIMA, or ſmall Boat-fly. This ſpecies is characteriſed by its greyiſh colour, but the head is brown; the upper wings truncate. It is found in this country and other parts of Europe. It is, as its name ſignifies, an exceedingly minute inſect, ſcarcely perceptible without the uſe of glaſſes. It is tranſverſely ſtriated.

MINUTA. Head yellow; thorax and upper wings green, with tranſverſe brown lines. It is an European inſect.

NOVEBORACENSIS. Yellowiſh; upper wings with three clouded, brown, longitudinal ſpots. It is found in New York.

OCTO-PUNCTATA. The head of this ſpecies is yellow; the thorax is browniſh; ſcutel black, with five white dots; the upper wings are brown, edged with white, and marked with four black dots. It inhabits Germany.

INDICA. This is of a glaucous hue; the upper wings are tipt with black. It inhabits India.

ATOMARIA. White; above and upper wings pale grey; under wings milky. It inhabits Ruſſia.

LUTEA. Upper wings whitiſh, with a marginal black ſtreak. It is found in Denmark; and is particularly deſcribed by Müller among the Daniſh inſects.

MARGINATA. Upper wings black, the edge and future yellow. This is alſo a Daniſh inſect.

B. *Sheath conic, ſpinous at the Sides.*

Species.

LINEATA. Upper wings brown, with two abbreviated yellow lines. It inhabits Cayenne, and is ſomething larger than the next.

* STRIATA. Upper wings pale brown, with numerous dots and ſtreaks of dark brown. It inhabits this country and ſome other parts of Europe: varies much in ſize; the head and legs are yellow. It frequents the water, and emits a diſagreeable ſmell. The elytra are pale, ſtriated with a number of undulating tranſverſe lines. Its ſhape is oblong; the forehead and feet are of a golden colour.

COLEOPTRATA. The upper wings are entirely coriaceous, brown, the outer margin yellow. It inhabits Sweden, and is very like the Striata.

MINOR. Upper wings greeniſh-aſh; it is immaculate. It is found in France, and is the Sigara minuta of Fabricius.

The inſects of this genus obtained the name of Notonectæ from the ſingular manner in which they ſwim on the back, preſenting the belly part uppermoſt. This ſituation ſeems admirably adapted to the manner which the creature adopts in feeding, which is on the under ſides of plants that grow on the ſurface of the water; for the animal, by having its mouth thus turned upwards, is capable of taking its food with great convenience; its motions are very nimble, diving down at the inſtant of alarm, and riſing again to the ſurface when the danger is paſt; the two hind legs ſerving for paddles.

NOTOPEDA, in *Zoology*. See ELATER.

NOTORIA, ARS. See ART.

NOTORIOUS, ſomething known, manifeſt, and public.

NOTOXUS, in *Entomology*, a genus of inſects of the order Coleoptera, of which the generic character is as follows: antennæ filiform; feelers four, hatchet-ſhaped; the jaw is one-toothed; the thorax is a little narrowed behind. Of this genus there are thirteen

Species.

PORCATUS. This ſpecies is black, and the ſhells have raiſed longitudinal lines. It is found in Van Diemen's land. The head is black; the antennæ are piceous; thorax cylindrical, pubeſcent; the ſhells are flat and obtuſe; the legs are piceous.

VIOLACEUS. This is pubeſcent, black, with a violet gloſs: the ſhells are ſmooth, with three yellow dots. It inhabits New Zealand.

BIFASCIATUS. Thorax rounded; body ferruginous; head black; ſhells with a black dot, band, and tip. This is a ſmall cylindrical-ſhaped inſect, and inhabits Lapland.

DUBIUS. Thorax brown; ſhell ferruginous, with a black line at the baſe, band in the middle, and dot at the tip. Found in many parts of Germany.

* MOLLIS. Downy; ſhells black, with three pale bands. It inhabits many parts of Europe, as well as our own country.

INDICUS. Head and thorax duſky; ſhells pale, ſtriate, punctured. It inhabits India.

CHINENSIS. Downy, brown; ſhells punctured, pale, with unequal black bands. It inhabits China, and is deſcribed particularly by Fabricius.

MONOCEROS. Thorax projecting like a horn over the head; ſhells pale, with a black band and dot. This is an Engliſh inſect, is deſcribed by Mr. Donovan as the Meloe monoceros, and is found on umbelliferous plants.

CORNUTUS. Thorax projecting like a horn over the head; ſhells with three black bands. It inhabits Italy.

BIPUNCTATUS. Thorax ferruginous; ſhell teſtaceous, with a black dot. It is ſmall, and an inhabitant of Germany.

* ANTHERINUS. Black; ſhells with two ferruginous bands. It inhabits this and other countries in Europe; is found on flowers, and is very nimble in its motions.

* FLORALIS. Black; thorax ferruginous. Like the laſt, it inhabits European countries, and is about the ſize of the laſt.

MINUTUS. Black, poliſhed; antennæ and legs paliſh. It is an European inſect, and is alſo ſmall.

NOTRE DAME, *our Lady*, a term frequently uſed for the Holy Virgin. Hence, feaſts of Notre Dame; the office

of

of Notre Dame; congregations, nunneries, and orders of Notre Dame.

NOTRE *Dame Bay*, in *Geography*, a bay on the E. coaſt of Newfoundland. N. lat. 49° 55'. W. long. 55° 40'.

NOTRE *Dame de Neves*, a town of Braſil, in the juriſdiction of Fernambuco.

NOT's ISLAND, a ſmall iſland near the coaſt of Virginia. N. lat. 38° 38'. W. long. 76° 5'.

NOTT, in *Agriculture*, a provincial term applied to hornleſs ſheep and cattle. It is often written *knot* and *natt*.

NOTTAWAY, in *Geography*, a county of Virginia, in America, bounded N. and N.W. by Amelia, from which it was taken in the year 1788; containing 3418 white, and 5983 black people.

NOTTALEN, a town of Germany, in the biſhopric of Munſter; 7 miles W. of Munſter.

NOTTINGHAM, a borough and market-town, and a county of itſelf, is ſituated on the river Leen, near its confluence with the Trent, in the county of Nottingham, England. It is diſtant 124 miles N.N.W. from London, and contains three pariſhes, St. Mary's, St. Nicholas's, and St. Peter's, beſides an extra-parochial diſtrict attached to the caſtle. This place, according to the parliamentary returns of 1811, compriſes 6842 houſes, and a population of 34,253 perſons, of whom 6815 families are engaged in trade and manufactures. In 1801 the inhabitants were only eſtimated at 28,861 in number.

The origin of Nottingham is not leſs involved in obſcurity than that of any other town in Great Britain, and few have been the ſubjects of more ſpeculation on this point among hiſtorians and antiquaries. John Rowſe, a monk of Warwick, quoted by Thoroton, in his "Hiſtory of Nottinghamſhire," places its foundation 980 years before the Chriſtian era; and ſome other old authors tell us that a Britiſh king, named Coilus, was interred here about the ſame period. Stukeley ſays, "one may eaſily gueſs Nottingham to have been an ancient town of the Britons;" and his conjecture is fortified with the opinion of Dr. Deering, who conſiders the caves in this neighbourhood, (to be afterwards noticed,) as decided evidence of a Britiſh colony. All theſe notions concerning the antiquity of the place, however, are merely hypothetical, or reſt upon the teſtimony of authors of more than doubtful veracity. Nor does the idea of Gale, that Nottingham was the Roman ſtation Cauſennis, deſerve much greater credit. In truth, no incident in its early hiſtory can be relied on as correct till the ſeventh or eighth century, when it ſeems to have been a conſiderable town of the Mercian monarchy. In the reign of Alfred it was of ſuch conſequence as to give name to the ſhire. It appears, however, to have much decreaſed before the Norman conqueſt, as Domeſday Book aſſigns to it only one hundred and twenty dwelling-houſes. This diminution of extent may have probably been the reſult of the Daniſh ravages, and of the ſtate of confuſion into which the whole country was thrown by the ſucceſsful invaſion of William. At this time, the dominion of Nottingham, and of the foreſt adjoining, was conferred on William Peverell, the king's baſtard ſon, who is ſaid to have given great encouragement to ſuch perſons as ſettled within the town. The court eſtabliſhed by this ſuperior lord, and from him called Peverell court, continued to be held till the 9th year of Edward II., when it was aboliſhed, or at leaſt limited in its juriſdiction. Whether Nottingham was an incorporated town previous to the Conqueſt, is almoſt equally uncertain as any other part of its early hiſtory; for though Deering ſays it "was doubtleſs a borough by preſcription before that event," he does not furniſh any evidence to authenticate his aſſertion. The firſt charter, now extant, was granted in the reign of Henry II.; but as that deed merely confirms privileges enjoyed by the burgeſſes in the time of his grandfather, Henry I., it ſeems not unlikely that this prince was the perſon who originally conſtituted Nottingham a corporate town. King John confirmed the charter of his predeceſſor, as did likewiſe Henry III. and Edward I., which laſt empowered the burgeſſes to elect a mayor and two bailiffs, and granted that the mayor ſhould be eſcheator within the borough. Henry VI. made the town of Nottingham a county of itſelf, and changed the bailiffs into ſheriffs. He likewiſe gave power to the corporation to chooſe from among themſelves ſeven aldermen, who ſhould act as juſtices of the peace within the town and county of the town. In this ſtate matters remained till the reign of James II., who deprived the burgeſſes of their charters; but theſe were reſtored, and ſome additional privileges granted, by king William, ſoon after his acceſſion to the throne: and under the charter of this monarch the town is now governed. The corporation conſiſts of a mayor, ſix aldermen, a recorder, two ſheriffs, two chamberlains, and a common-council, compoſed of twenty-four burgeſſes, eighteen of whom are choſen by the freemen at large, but muſt have ſerved the office of ſheriff, and are the ſenior council, whilſt the remaining ſix are choſen in the ſame way from the body at large, and form the junior council. Theſe, however, have equal votes and equal rights with the others, except that the magiſtracy muſt be filled up from the ſenior body. Beſides theſe officers, there are a town-clerk and a ſteward attached to the corporation; and an officer called a ſcavenger, who ſuperintends the paving of the ſtreets. There are likewiſe two pinders of the town: one of the field and another of the meadows. He that is of the fields is alſo woodward, and attends and anſwers for the town at the foreſt-courts. The mayor holds a particular court of pleas of land; and he and the ſheriffs hold an ordinary court of record every alternate Wedneſday. This town ſends two members to parliament. The right of election is veſted in the mayor and corporation, together with the freeholders of 40*s. per annum*, the eldeſt ſons of freemen by birth, younger ſons of freemen, if they have ſerved ſeven years' apprenticeſhip any where, and the freemens' apprentices, as was ſettled by a deciſion of the houſe of commons in 1701. The number of voters has been eſtimated at 1700.

Nottingham has been the ſcene of many events of hiſtorical importance in almoſt every era of the Engliſh hiſtory. In the year 852, the Danes, having taken poſſeſſion of this place, were beſieged in it by Buthred, king of Mercia, but with ſo little proſpect of ſucceſs, that he was obliged to requeſt the aſſiſtance of Ethelred, king of Weſſex, and Alured his brother, who accordingly collected an army, and ſet out to join the forces of the Mercian monarch. This aid, however, did not prove ſo immediately effective as might have been ſuppoſed, for the Danes fought with ſuch deſperation, that the Saxons found it prudent to conclude a treaty with them, after a ſiege of ſeveral months, in which it was ſtipulated that they ſhould immediately quit the Mercian dominions, and leave them in future unmoleſted. But the invaders did not long adhere to theſe terms; for, returning the next year, they laid waſte a great part of that kingdom; in conſequence of which, king Buthred retired to Rome. In 942, the Danes again took poſſeſſion of this town, and held it for two years, when it was beſieged and retaken by king Edmund, and remained in the poſſeſſion of the Saxons till Canute, the Dane, made himſelf maſter of all England.

During the troubleſome reign of king Stephen, Nottingham, having been taken by the earl of Gloceſter in 1140, was

was plundered, and nearly burnt to the ground. It was ſoon, however, rebuilt, and in 1153 once more met with the ſame misfortune, in the conteſts between Henry II. and his ſon, prince Henry, whom he had injudiciouſly cauſed to be crowned during his own life-time. From this period, the town lay in aſhes till the reſtoration of peace, at which time great exertions were made for its re-eſtabliſhment; and the king granted to the inhabitants the charter above-mentioned, as the reward of their loyalty. In the reign of Richard I., when his brother John raiſed the ſtandard of rebellion againſt him, Nottingham changed maſters ſeveral times; and a parliament was called here by Richard, in which John's eſtates were declared forfeited to the crown. Edward III. alſo held ſeveral parliaments at this town, in one of which were enacted thoſe laws relative to the ſettlement of the Flemiſh manufacturers, that may juſtly be regarded as having laid the foundation of England's greatneſs, as a trading and commercial country. The ſame parliament alſo paſſed that patriotic law, forbidding all perſons, except the royal family, to wear any foreign made cloths; and likewiſe prohibited the exportation of Engliſh wool.

A curious attempt to infringe on the liberty of election took place at Nottingham in the reign of Richard II. This monarch, having been forced by the parliament to diſmiſs his favourite, the marquis of Dublin, reſolved to concert meaſures for his reſtoration at court, and for the aſſumption of arbitrary power. He accordingly proceeded to Nottingham, and commanded all the ſheriffs and judges of the different counties to meet him there on important buſineſs. To theſe, when aſſembled, he communicated his deſign of levying an army to chaſtiſe thoſe noblemen who had been moſt active in reſtraining his prerogatives, and demanded to know from the ſheriffs what number of troops they could raiſe immediately. He further ordered them not to permit any repreſentative to be choſen for the enſuing parliament, whoſe names were not in the liſt furniſhed by himſelf; but the ſheriffs firmly told him it was not poſſible to execute his commands, for the people were in general ſo partial to the barons, that it would be difficult to raiſe an army againſt them; and ſtill more ſo to deprive his ſubjects of their parliamentary rights. The judges, however, were not ſo ſcrupulous, for, when aſked their concurrence to the propoſed meaſures, they declared their acquieſcence in them, and acknowledged the king to be ſuperior to all law; but notwithſtanding this ſubſerviency of the judges, Richard found it impoſſible to effect his purpoſes at Nottingham, and therefore returned to London.

This town ſubſequently became remarkable for having been the place of rendezvous for the troops of Edward IV., who cauſed himſelf to be proclaimed king here ſhortly after his arrival in England, in the year 1461; and in 1485, Richard III. marched hence towards Boſworth field, where he was defeated and ſlain. In 1487, his ſucceſsful rival, Henry VII., held his council of war here previous to the battle of Stoke. From this time, till 1642, nothing of importance occurs in the annals of Nottingham; but in that year it was diſtinguiſhed as the place whence king Charles firſt formally raiſed his ſtandard againſt the parliament. The inhabitants, however, being chiefly attached to the republican cauſe, his majeſty was ſoon obliged to abandon the town, to the parliamentary forces. Many intereſting and curious particulars reſpecting this town, its caſtle, and the cuſtoms of the people, during the civil wars, are detailed in "Memoirs of the Life of Colonel Hutchinſon," 2 vols. 8vo. 1810.

It was at Nottingham that the meeting took place between the earl of Devonſhire and a number of other noblemen, in order to promote the glorious revolution of 1688, from which period the hiſtory of this town is little more than the hiſtory of its trade and manufactures, except that in 1795 ſome diſturbances happened here in conſequence of the overweening loyalty of one party, who choſe to puniſh with ducking ſome ridiculous effuſions of democratical zeal in the other. They were quelled, however, with little or no bloodſhed; and Nottingham continued in quiet and proſperity till the commencement of the year 1811, when the ſtate of our continental relations having thrown many of the manufacturers out of employment, they erroneouſly attributed that effect to the adoption of machinery, inſtead of referring it to its true ſource; and hence were induced to form combinations for the purpoſe of frame-breaking, ſo dangerous in their tendency, as to call for the vigorous interference of the legiſlature.

Nottingham, with reſpect to ſituation, has many advantages. It ſtands on a conſiderable eminence, called the Dolorous-Hill, from a tradition that king Humber made a great ſlaughter of the Britons here, in the reign of Albanact. On three ſides riſe gentle hills, which ſerve to ſhield it from the more hurtful blaſts, whilſt its ſouthern aſpect is fully expoſed to the enlivening rays of the ſun at all ſeaſons of the year. From this ſide it overlooks the fertile and extenſive vale of Belvoir, the Nottinghamſhire wolds, and the hills of Leiceſterſhire; and exhibits to the traveller, as he approaches it, the novel proſpect of three tiers of ſtreets, riſing regularly one above the other, and apparently emboſomed in rock. Should he enter from the eaſt, the whole maſs of building is ſeen foreſhortened; the tower of St. Mary's church and the caſtle then appear nearly in one group; and with the long line of the Trent and Leen bridges raiſe ideas of its ſize and importance, which its ſeemingly circumſcribed limits would not otherwiſe have juſtified. In approaching from the north, the view is of a very oppoſite character. Not a building of any deſcription can be diſcovered, except the church tower, till the traveller reaches the ſummit of a ſmall hill above the race ground, when the town burſts inſtantaneouſly upon the view, as if by enchantment; and ſeems to lie in the centre of an expanded level below. The rivers Leen and Trent appear as on a map; and the fertile vale, ſtretching itſelf beyond them, forms a ſtriking contraſt to the bleak and open country through which he has paſſed. It looks like a new world ſtarting into exiſtence, and impreſſes upon the mind of taſte and feeling ſenſations of peculiar delight. On the weſtern road the character of the ſcenery is yet different from any of the others. Arriving at the village of Wollaton, the town is juſt ſeen; and all that is deſcried is then in a commanding ſituation. The caſtle and its bold cliffs riſe abruptly from the verdant ſwells in the park; in the centre the barracks ſeem to form a town of themſelves; and to the left are a number of windmills, which immediately excite the idea of a Dutch or of a Flemiſh town.

Nottingham was anciently ſurrounded by a maſſive wall and a ditch, though but few traces of either now remain. In Leland's time, however, much of the wall was ſtanding, and ſeveral of the gates. One of the latter, indeed, ſtill remains, and as it has been excavated from the ſolid rock, may continue permanent for many ages. Edward the Elder was the firſt who fortified this town, about the year 910; but the wall being greatly damaged during the Daniſh wars, it was almoſt entirely renewed by the Conqueror and his ſucceſſors to Henry III. The extent of the town at that period is uncertain, as that circumſtance is not mentioned by any author before Dering, who ſays that it meaſured two ſtatute miles in circumference, about the commencement of the

the laſt century. Its boundaries now probably include a ſpace of ſomewhat more than four miles, excluſive of many detached houſes, which conſtitute partial ſuburbs. The county of the town extends about ten miles in circuit, and till the year 1802 was free from the juriſdiction of the magiſtrates of the ſhire. Theſe limits are perambulated twice a year by a jury choſen for the purpoſe, who are likewiſe bound to walk occaſionally through the ſtreets to prevent encroachments and nuiſances. In this part of their duty, however, they are not ſo effective as might be wiſhed; for it is believed that there are few towns more irregularly built than Nottingham. The ſtreets, with the exception of Caſtle-gate, and the High Pavement, are very narrow; and far from being kept in a proper ſtate with reſpect to cleanlineſs, though much improvement, it muſt be admitted, has lately taken place in this particular. Moſt of the houſes are built of ſtone or of brick, in the modern ſtyle, but a ſmall proportion of them are of ancient erection. The whole town is divided into three pariſhes, and ſeven wards. Chapel-ward, on the weſtern ſide of the town; Caſtle-ward, in the vicinity of the caſtle; Market-ward, including the market-place, and the Long Row and lanes leading to the north of it; North-ward, which embraces the north-eaſt diviſion of the town; Bridge-ward, between St. Mary's and the Leen, and the lanes and ſtreets to the eaſtward; Middle-ward, to the eaſt of Market-ward; and Monthall-ward, containing the Low and part of the High Pavements. Each alderman, though poſſeſſing a peculiar juriſdiction over his own ward, is not obliged to reſide in it; for, indeed, his juriſdiction as a juſtice of the peace properly extends over the whole town.

Nottingham contains ſeveral buildings appropriated to public purpoſes. The town-hall, ſituated on the High Pavement, is a large building, three ſtories high, with the town-priſon on the ground floor. Behind this edifice is the county-priſon, which is ſaid to be managed under very excellent regulations. The town and county-gaol is alſo as commodious as circumſtances will admit of. It would ſtill, however, require much amelioration to render it complete; and the ſame thing may be remarked of the town-bridewell, which ſtands in St. John's-ſtreet, and was till lately a diſgrace to the town. The workhouſes are three in number, and are all laid out upon a convenient plan, and kept exceedingly clean. But the chief glory of Nottingham is its eſtabliſhments for the relief of the diſeaſed. The infirmary may vie, in point of architectural elegance, and internal arrangement, with any building in the country ſet apart for ſimilar purpoſes. It conſiſts of a centre, two advancing wings, and two ends; and is ſituated in a fine, airy ſcite, ſurrounded with pleaſant walks and gardens. The firſt ſtone of this ſtructure was laid in 1781, cloſe to the ſpot on which king Charles erected his ſtandard in 1642, whence the place is ſtill diſtinguiſhed by the name of Standard-hill. The total number of patients to whom aſſiſtance had been afforded from this inſtitution, ſince its opening, up to March 1811, amounted to 33,926 perſons. The lunatic aſylum is likewiſe an elegant building, and in every reſpect admirably adapted to its object. It was opened for admiſſion in February 1812. According to the preſent regulations, the patients form three claſſes; perſons who can pay for their care and maintenance in proportion to their ability; perſons admitted on the payment of very ſmall ſums; and paupers, for whom a certain rate muſt be paid by the county. Beſides theſe inſtitutions for the relief of the poor, there are perhaps a greater number of hoſpitals here than in any other town in the iſland; Plumptre's hoſpital, founded in the reign of Richard II., has been lately repaired and augmented by a deſcendant of the founder; and now ſupports thirteen poor old women, under the management of a chaplain and maſter. Collin's hoſpital, built in 1704, affords an aſylum to twenty-four poor men and women, each having two comfortable apartments, and two ſhillings *per* week, with a ton and a half of coals *per annum*. The other hoſpitals are Willoughby's hoſpital in the Fiſhergate; Gregory's hoſpital in Houndſgate; Woolley's hoſpital in Beck-lane; Handley's hoſpital in Storey-ſtreet; Labourer's hoſpital on Tollhouſe-hill; Warſargate hoſpital, &c.; the whole of which afford relief to upwards of 70 poor and infirm individuals; and independent of them are ſeveral alms-houſes, and charity eſtabliſhments in the town, of which laſt the moſt important are known by the appellation of the Peckham and Coventry charities.

The churches of Nottingham belonging to the eſtabliſhment are four in number; St. Mary's, St. Peter's, and St. Nicholas's pariſh churches, and the extra-parochial chapel of St. James, lately built in conſequence of the increaſed population of the town. St. Mary's church, ſtanding on a bold eminence, is built in the form of a croſs, and is apparently of the ſtyle prevalent in the reign of Henry VII., though ſome authors aſſert it to be of a much older date. It has lately undergone a thorough repair, and in the execution of his taſk the architect has diſplayed conſiderable taſte and diſcrimination. In this church are ſeveral monuments of the earls of Clare, and of the Plumptre family. St. Peter's church is reckoned a handſome edifice, and is adorned with a lofty ſpire, but, upon examination, great incongruity appears in the ſtyle of its architecture, ariſing from the alterations and repairs it has undergone at different eras. St. Nicholas's church was erected in 1678, on the ſcite of one more ancient, pulled down during the civil wars, on account of its proximity to the caſtle, a circumſtance which might have rendered it beneficial to a beſieging army. This ſtructure is of brick, ornamented with ſtone corners. It conſiſts of a ſpacious nave, and two ſide aiſles, both of which have been greatly enlarged within theſe few years. The church of St. James's, ſtanding near that of St. Nicholas's, is built in imitation of the early pointed ſtyle. Theſe being the only places of worſhip connected with the eſtabliſhment in Nottingham, they are, as may be ſuppoſed, wholly inadequate to the accommodation of its numerous inhabitants. Hence diſſenting and ſectarian meeting-houſes are frequent, and uſually well attended, not merely by the inferior orders, but by the more reſpectable claſſes of the community. The Preſbyterians have two meeting-houſes, one on the High Pavement and the other near Caſtle-gate; and the general Baptiſts, the baptizing Calviniſts, Quakers, and Weſleyan Methodiſts, have each one. The latter ſect, however, far exceed any of the others in point of number. A few Roman Catholics have a chapel in Storey-ſtreet.

The market-place of Nottingham has been long admired. Leland ſays "it is the moſt faireſt without exception of all England," and it is certainly one of the moſt ſpacious in the kingdom. At the upper end of it formerly ſtood the Malt croſs, but that, with all the other croſſes in the town, were deſtroyed during the great rebellion. The market days are Wedneſday and Saturday; and there are three large fairs during the year. All of theſe are for cattle and horſes, and the laſt alſo particularly for cheeſe. The new exchange is ſituated at the eaſtern corner of the market area. It was erected by the corporation in the early part of the laſt century, and is a handſome brick building, four ſtories high, and 123 feet in length. In front it is ſupported by a range of

ſtone pillars, forming a ſpacious, open façade, under which a part of the ſhambles are fixed.

The chief manufacture carried on in Nottingham is that of ſtockings, but we do not know that any correct eſtimate of the number of frames employed in this trade has been made lately. Deering ſays they exceeded 1200, in the middle of the laſt century. The bone-lace manufacture was likewiſe a ſource of great profit to the town, previous to the recent unhappy diſturbances, and the improvements made by many of the manufacturers ſeemed to authorize the concluſion that we ſhould ſoon have been enabled to rival the French in that, their much boaſted branch of manufacture. Here are alſo ſeveral mills for ſpinning ſilk and cotton, as well as for twiſting, ſome dyeing and bleach works, and a variety of breweries, malt-houſes, and tanneries. The public ſchools in this town are fully ſufficient in number for its ſize, and, from the recent regulations which have been made reſpecting them, are likely in future to anſwer every benevolent purpoſe for which they were founded. The free grammar-ſchool was erected and endowed, in 1513, by Agnes Mellors, the widow of a wealthy bell-founder in Nottingham. This ſchool had almoſt fallen into diſuſe, but in 1807 its importance was revived by the exertions of the corporation, and now ſixty boys are taught in it, not only Greek and Latin, but Engliſh, writing, and arithmetic, *gratis*. An excellent charity-ſchool is likewiſe eſtabliſhed on the High Pavement; which is entirely ſupported by voluntary contribution, and maintains fifty poor children of both ſexes, who are inſtructed in religion and in Engliſh reading. There are alſo ſeveral ſmaller ſchools, ſupported on the ſame liberal principles; one, in St. Mary's pariſh, educates thirty poor children, and another ſixteen. The Proteſtant Diſſenters ſupport one for the poor children of their own perſuaſion, who are clothed, and plainly educated. A church of England Sunday ſchool has been for ſome time in exiſtence, whoſe receipts, in 1811, amounted to 127*l.*; and many others have been lately eſtabliſhed by private individuals, either alone or collectively. The total number of children educated at theſe ſchools, and at private ſeminaries in this town, is eſtimated to exceed three thouſand.

The public amuſements of Nottingham are ſimilar to thoſe of moſt other large provincial towns: *viz.* aſſemblies, balls, concerts, theatrical repreſentations, and horſe races. The aſſemblies, balls, and concerts, are held in a large and ſpacious building in the Low Pavement. This edifice is ſtill called the "Ladies' Aſſembly Rooms," though the reaſon of the diſtinction, (the exiſtence of another, named "The Tradeſman's Aſſembly,") has long ſince ceaſed to trench upon the harmony of ſociety, by ſeparating the middle claſſes from what was termed the polite circle. The theatre is a plain ſtructure, without any external decorations, but very judiciouſly fitted up and arranged within. The races take place annually in July, on a courſe on the north ſide of the town. It was formerly four miles, though now only two miles round; and is ſaid to be one of the beſt race tracks in England, ſo far at leaſt as regards the nature of the ground. The race-ſtand, built by Mr. John Carr, of York, is a very elegant modern edifice, two ſtories high, the lower ſtory projecting ſome diſtance beyond the upper, and having a balluſtrade on the top, and a terrace, to which opens the upper room of ſeven windows in front. Equeſtrian and other itinerant exhibitions are occaſionally brought forward at the riding ſchool, which is ſituated at the Caſtle-gate.

Nottingham formerly contained ſeveral religious inſtitutions. Leland ſays "there hath been three houſe of freres, as I remember, whereof two ſtoode toward the weſte of the town, and not far from the caſtelle." The Franciſcans, or Grey friars, had a houſe in the weſt part of the town, in a place called the Broad Marſh, not far from the caſtle. The wall which encircled the garden reached as far ſouth as the river Leen. This houſe was founded by Henry III. A.D. 1250, and was granted at the diſſolution to Thomas Heneage. Between Moot-hall gate and James's lane ſtood a houſe of Carmelite, or White friars. It was founded by Reginald, lord Grey de Wilton, and ſir John Shirley, knt. in the year 1276. The ſcite was granted by Henry VIII. to James Sturley. The houſe of the Hoſpitallers was ſituated at the northern extremity of the town, near the north road. The period of its foundation is unknown, but it was in exiſtence as early as the reign of king John, and was valued at 5*l.* 6*s.* 8*d.* *per annum* in the time of Henry VIII. St. Leonard's hoſpital for lepers ſtood ſomewhere on the eaſtern ſide of the town. The inhabitants of this houſe had the privilege of cutting the dead wood in the foreſt of Nottingham. St. Sepulchre's was a brotherhood in the reign of Henry III., but the date of its foundation is not mentioned. In the church of St. Mary was a guild, or fraternity dedicated to the Holy Trinity. Their houſe on the High Pavement is ſtill ſtanding, and retains its original name. Beſides this guild there were three chantries in St. Mary's church. In St. Peter's church was a guild of St. George, and a chantry dedicated to St. Mary; and in the church of St. Nicholas was a fraternity alſo dedicated to the bleſſed Virgin.

In ſurveying the vicinity of Nottingham, the moſt prominent object which demands attention is the caſtle. This edifice is ſituated on a bold rock on the weſtern ſide of the town; and was built, in 1680, upon the ſcite of a more ancient fortreſs, originally erected by William the Conqueror, and afterwards much enlarged and beautified by Edward IV. and Richard III. At an early period it ſeems to have been eſteemed a very ſtrong poſt; for in the reign of Edw. III. we find it taken poſſeſſion of by Mortimer, earl of March, and the queen mother, as a place of ſecure reſidence againſt any efforts of the young monarch to bring the hated paramour to condign puniſhment. The king was therefore obliged to employ ſtratagem to effect his object of ſeizing Mortimer's perſon. He gained the governor, and entered the caſtle by a ſecret paſſage, which led to the ſtate apartments, and ſucceeded, after ſome ſtruggle, in apprehending the earl. Much diſpute has prevailed among antiquaries reſpecting the paſſage here alluded to. Camden deſcribes it as the ſubterraneous cavern now called Mortimer's hole; but Deering and Thoroton evidently ſhew that the great antiquary is erroneous in ſo doing; though neither of theſe authors were enabled to determine its proper ſituation. Mr. Stretton, however, a gentleman of Nottingham, has lately cleared up the point, by the actual diſcovery of the paſſage, which, with much labour and expence, he has been enabled to trace through all its windings to its termination at the ſcite of the ancient keep, where the royal apartments are recorded to have been ſituated.

The old caſtle is thus deſcribed by Leland. "The baſe court is large and meetly ſtrong, being beſtes and giantes over the ditch into the ſecond warde; the frontier of the which warde in the entering is exceedinge ſtronge with toures and portecoleces; much part of the weſt ſide of this inner warde as the haul and other things be in ruins. The eſt ſide is ſtrong and well toured; and ſo is the ſouth ſide. But the moſt beautiffulleſt and gallant building for lodging is on the north ſide, where Edward the Fourth began a right ſumpteous pece of ſtone work, of the which he clerely finiſhed an excellent goodlie toure of three heightes in building; and brought

brought up the other part likewiſe from the foundation with ſtone and marvelus fair cumpaced windows to lay yng of the firſt ſoyle for chambers." In this caſtle were feveral chapels. Tanner informs us that here was a college for fecular prieſts and a cell dedicated to St. Mary, in the chapel of St. Mary under the rock.

The preſent caſtle is altogether different from the ancient one, having been deſigned only for the reſidence of the family of the duke of Newcaſtle, by whom it was erected. It is a large edifice on a ruſtic baſement, which ſupports an ornamented front of the Corinthian order, with a grand, double flight of ſteps leading to the principal range of apartments. Over the door on the north-eaſt front here alluded to, is an equeſtrian ſtatue of the founder, ſculptured from one ſolid block of ſtone. The other ſides of the building are handſome, but leſs ornamented than this, and ſurrounding the whole is a noble terrace, which has long been a favourite promenade of the faſhionables of Nottingham, and is certainly one of the fineſt to be found in the vicinity of any town, as it commands ſeveral extenſive and varied views. The interior of the caſtle was once elegantly fitted up, and diſplayed much magnificence, but all the apartments having been neglected for many years, now contain nothing worthy the attention of the ſtranger or the touriſt.

Mortimer's hole, above-mentioned, is a moſt extraordinary work of the labour of our anceſtors; but the preciſe purpoſe for which it was formed and uſed is unknown. The entrance to it has been provided with no leſs than ſix gates, beſides the ſide one on the left hand, ſince diſcovered to be the ſecret paſſage by which king Edward was admitted into the fortreſs, as already noticed. The diſtance between the firſt and ſecond gate was about 48 feet, from this to the third 42 feet, and from the third to the fourth 45 feet; 159 feet below this ſtood the fifth gate; and 27 feet ſtill lower was the ſixth and laſt gate, which opened into the rock yard, but is now filled up; ſo that the whole length of this, once well ſecured, paſſage was 107 yards, or 321 feet. It is ſeven feet high, and ſix feet wide, and had all the way down broad ſteps cut in the rock; and likewiſe openings in the ſame to admit light, and alſo to ſerve the ſoldiers to ſhoot their arrows through. In the upper part theſe holes have been much enlarged, and regularly conſtructed as port holes for cannon, which were placed here during the civil wars. There are beſides in this part of the vault many excavations, about a foot in height, breadth, and depth. Theſe are conjectured to have been made to lodge cannon balls, to prevent their rolling to the bottom.

The park furrounding the caſtle is but ſmall, containing only 130 acres, and is at preſent in a very neglected ſtate. It has no deer, and but very few trees; and indeed is only peculiarly deſerving of notice on account of its Caves, or Papiſt-Holes, as they are vulgarly called, which ſtand weſt from the caſtle, in the face of a cliff almoſt cloſe to the river Leen. Concerning theſe curious monuments antiquaries are much divided in opinion, ſome conſidering them as Druidical temples, others as places of ſafety excavated by the Britons, and not a few as works of Roman conſtruction. The truth probably is, that nature herſelf has done more towards their formation than art, and that ſuch parts of them as bear evident marks of human contrivance, were not the work of one age or people, but of different ages and different nations. Some of theſe caves are, no doubt, extremely ancient, while others of them have not probably exiſted above three or four centuries. Stukeley, who viſited this place in the early part of the laſt century, obſerves, on the ſubject of the caves, that "what is viſible at preſent is not of ſo old a date as the time of the Britons, yet I ſee no doubt that it is founded upon their's. This is a ledge of perpendicular rock hewn out into a church, houſes, chambers, dove-houſe, &c. The church is like thoſe in the rocks at Bethlehem, and other places in the Holy Land. The altar is a natural rock, and there has been painting upon the wall; a ſteeple, I ſuppoſe where a bell hung, and regular pillars. The river, here winding about, makes a fortification to it, for it comes to both ends of the cliff, leaving a plain before the middle. The way to it was by gates cut out of the rock, having an oblique entrance for greater ſafety. Without is a plain with three niches, which I fancy their place of judicature or the like; between this and the caſtle is a hermitage of like workmanſhip." To this deſcription it is ſcarcely poſſible to add any thing that will convey a more correct idea of the place, even as it remains at the preſent day, except that the outer parts have fallen down at ſeveral points, evidently from the effect of damp and froſt, but the church and altar, and ſome few veſtiges of ancient paintings, may be clearly traced. Many of the pillars are ornamented with capitals, &c. and the ſpandrilled pointed arch is very well imitated in various places; a fact which militates moſt forcibly againſt their very early antiquity. It is much to be regretted that no care is taken to preſerve this venerable and curious ſpecimen; the floor of it is broken into holes where the water lodges, and much of it is disfigured with the groſſeſt filthineſs. In ſummer theſe caves are the haunts of the very loweſt of ſociety, who there take up their nocturnal abode.

At the upper end of the caſtle park, adjoining to the Derby road, is an extenſive range of barracks erected by government in 1792-3. The buildings are of brick, and command a view over the whole town.

Beſides the caverns above-mentioned, many other caves are ſituated in the neighbourhood of Nottingham, and ſome of them even within the boundaries of the town. Of theſe the moſt remarkable cluſter is at the village of Sneinton, which is ſuppoſed by ſeveral authors, and not without conſiderable ſhow of probability, to have been the ſcite of ancient Northampton, previous to the Norman conqueſt. It is now, however, a diſtinct lordſhip and pariſh of itſelf; and the ancient chapel dedicated to St. Stephen ſtands upon the ſummit of the excavated rock, but has nothing particular to recommend it to notice, except the very beautiful and extenſive proſpect which it commands over the vale of Belvoir. The village here is truly romantic, as many of the habitations are built within the rock, and have ſtaircaſes that lead up to gardens on the top. To a ſtranger it is extremely curious to ſee the perpendicular face of the rock with doors and windows in tiers, and the inhabitants peeping out of their dens, like the inmates of another world; in fact, if it had not been at home, and therefore little regarded, this place would, without doubt, have been novelized and melo-dramatized, until all the faſhionable world had been mad for getting under ground. Thoroton's Hiſtory of Nottinghamſhire, republiſhed by John Throſby, three vols. 4to. London 1799.—Nottinghamia Vetus et Nova, or the ancient and preſent State of the Town of Nottingham, by Charles Deering, M.D. 4to. edit. 1751. Beauties of England and Wales, vol. xii. by Mr. Laird.

NOTTINGHAM, a poſt-town of America, in Rockingham county, New Hampſhire; 12 miles N. of Exeter, incorporated in 1722, and containing 964 inhabitants.—Alſo, the moſt northern town of Burlington county, New Jerſey, on the E. bank of Delaware river, between Berdentown and Trenton.—Alſo, a town in Prince George's county, Maryland, on Patuxent river; 16 miles N.E. of Piſcataway.

NOTTINGHAM, *Weſt*, a poſt-town in Hillſborough county,

New Hampſhire, ſituated on the W. ſide of Merrimack river; incorporated in 1746, and containing 1267 inhabitants; about 45 miles N.N.W of Boſton.

NOTTINGHAM, *Eaſt* and *Weſt*, two townſhips in Cheſter county, Pennſylvania; the former having 889, and the latter 454 inhabitants.

NOTTINGHAM *Iſland*, an iſland in Hudſon's Bay. N. lat. 63° 30'. W. long. 78° 30'.

NOTTINGHAMSHIRE, one of the central counties of England, is bounded on the weſt by Derbyſhire; on the north by Yorkſhire; on the eaſt by Lincolnſhire; and on the ſouth by the county of Leiceſter. Its figure approaches to the elliptical; its tranſverſe diameter extending from Alkley or Fenningly in the north, to Stanford-upon-Soar on the Leiceſterſhire border, being a length of fifty miles; whilſt its conjugate, or ſhorteſt diameter, from Teverſhall on the Derbyſhire border, to Collingham, which joins to Lincolnſhire, may be eſtimated at twenty-ſix or twenty-ſeven miles. It is ſituated between fifty-two degrees fifty minutes, and fifty-three degrees thirty-four minutes, north latitude; and its circumference is computed to exceed one hundred and forty miles, and to contain a ſuperficial area of 480,000 acres. According to the parliamentary returns of 1811, the houſes in this ſhire amounted to 32,462, and the inhabitants to 162,900 in number; whereas in 1801 the houſes were only reckoned at 26,153, and the population at 140,350 perſons.

*Hiſtory.*—Previous to the coming of the Romans, as little is known reſpecting this county as of any other portion of our iſland. At that event it formed a part of the territories of the Coritani, who are ſaid by Camden to have poſſeſſed the counties of Nottingham, Lincoln, Leiceſter, Derby, Rutland, and Northampton. Theſe made a powerful reſiſtance againſt the progreſs of the Roman arms; but being ultimately obliged to ſubmit, their dominions were included in the province of Maxima Cæſarienſis, which extended from the river Thames to the Humber. When the Saxons obtained poſſeſſion of Britain, Nottinghamſhire became part of the Mercian monarchy, and was doubtleſs during that period the ſcene of many conflicts between that kingdom and the other nations of the heptarchy. Nottingham, Newark, Southwell, and other towns in this county, frequently ſuffered from the incurſions of the Danes, as the reader will find mentioned under the names of the reſpective places at which their depredations were committed. After the overthrow of the Saxon heptarchy, and the union of its ſeveral kingdoms under the ſuperior ſway of Alfred, Nottinghamſhire was governed by the earls of Mercia, during whoſe domination no incident worthy of hiſtorical notice ſeems to have occurred within its boundaries. At the Conqueſt, the ſame changes took place here as in other counties; the lands being parcelled out among thoſe who contributed by their talents or valour to place the crown on the brow of William. In his reign, and that of his three immediate ſucceſſors, many caſtles were erected to ſecure the ſubjection of the country. Of theſe, the principal were the caſtles of Newark and Nottingham, at both which places ſeveral events of hiſtorical importance have taken place at different eras. King John died in the caſtle of Newark; and Nottingham has been rendered remarkable as the place of refuge choſen by Mortimer and queen Iſabella, where they wiſhed to ſecure themſelves from falling into the hands of Edward. At Stoke, not far from Newark, Henry VII. engaged and defeated the earl of Lincoln, who had raiſed a formidable army to ſupport the pretenſions of the impoſtor Lambert Simnel in 1487. During the time of the civil war of Charles I. Newark was remarkable for the loyalty of its inhabitants; and Nottingham no leſs ſo for its ſteady adherence to the parliament. For ſome particulars of the tranſactions of that period, ſee NEWARK and NOTTINGHAM.

*General Aſpect, Soil, and Climate.*—The ſurface of this county, with the exception of the level along the banks of the river Trent, is uneven, and perhaps may be termed a hilly diſtrict, though none of the hills riſe to any conſiderable elevation. The Nottinghamſhire wolds conſtitute a range of high, open country, reſembling the wolds of Yorkſhire, and the downs of Wiltſhire, and form a ſtriking contraſt to the cloſe and fertile vale of Belvoir, and the well wooded tract of Sherwood foreſt, which occupies a great part of the weſtern diviſion of the county. The uſual diſtribution of the ſoil is into ſand or gravel, clay, lime-ſtone, and coal land; and the firſt of theſe is again ſubdivided into foreſt country and borders, the Trent Bank diſtrict, and the tongue of land beyond or eaſt from that river. The Trent bank diſtrict accompanies the river through its whole courſe within the county, and varies in breadth from one to five miles. Here the ſoil is in general a mellow or vegetable mould, lying on ſand or gravel, which ſometimes appear on the ſurface. The ſame ſoil prevails alſo on the banks of the Soar, from its junction with the Trent up to Rempſton, and is for the moſt part equally fit for tillage or for paſture. The ſandy diſtrict, eaſt of Trent, on the other hand, is extremely poor, and taken up with low moors, which are much flooded by rains. In the clay diſtrict there are two diviſions, uſually called "the north and ſouth clays." The firſt of theſe, having a conſiderable mixture of ſand in its compoſition, is more eaſily ſuſceptible of agricultural labour than cold clay lands in general. In the more northern portions, it is agreeably diverſified with hill and dale; whilſt its bold promontories, riſing abruptly from the dead level of Miſſon-Car, and their continuation in Lincolnſhire, appear evidently to have been at ſome remote period the boundaries to an ocean, which muſt once have flowed over what is now a ſcene of rich cultivation. It is indeed impoſſible for any one to contemplate the view from Gringley-on-the-Hill without drawing this concluſion, and it ſeems ſtill more evident if the hills are viewed from below, when they have all the ſemblance of iſlands riſing from the boſom of the deep; for their northern aſpect preſents a ſeries of abrupt cliffs, but on the other ſide they ſink gradually into the general line of the country. The ſouth clay diſtrict is leſs extenſive than the north. It is, however, by far the moſt valuable diviſion of the county, as it includes a great part of the vale of Belvoir, which offers a ſcene of cultivation not ſurpaſſed by any other in the kingdom. The wolds, ſkirting the vale, partake of the nature of its ſoil, but from their lofty and expoſed ſituation are deſtitute of its fertility, though certainly well adapted for plantations. The lime-ſtone and coal lands are ſituated on the weſtern verge of the county, and have in ſome places a ſurface of vegetable mould, but chiefly a cold blue or yellow clay. In point of climate, it may be obſerved, that Nottinghamſhire is conſidered by all writers as much drier than moſt of the neighbouring counties; and this opinion has lately been confirmed by accurate and repeated experiments. The fact is explained by Mr. Lowe, in his agricultural ſurvey, upon the very rational principle, that the clouds from the weſtern ocean break on the hills of Derbyſhire and Yorkſhire, and diſcharge themſelves before they reach the comparatively level diſtrict of Nottinghamſhire; while thoſe from the German ocean, being powerfully attracted by the ſame mountains, paſs over the county too quickly to depoſit much of their moiſture. This general dryneſs, as may be ſuppoſed, is favourable to the temperature of the air; which, except in the marſhy grounds

and in the wolds, is almoſt equally warm as the more ſouthern counties.

*Agriculture.*—The kinds of grain uſually cultivated in the county of Nottingham are the common ones of wheat, rye, barley, oats, beans, and peaſe; the rotation of crops, and the amount of their produce, differing according to the quality of the grounds upon which they are raiſed. The wheat commonly ſown is the red Lammas, and the white chaffed or Kentiſh ſort, which in common fields yield from two to three quarters, and in incloſures from two and a half to four quarters. A ſpecies of oats, called ſkegs, is much cultivated in this county, and ſuppoſed to be peculiar to it. Theſe afford a crop double that of any other kind of the ſame grain in quantity, but not more than equal in weight. They will grow in the pooreſt land, where indeed nothing elſe can be raiſed, and are reckoned very ſweet food for cattle of all kinds. In the Agricultural Survey, this ſort of oats is called the "Arena ſtipiformis" of Linnæus, and defined ſcientifically as "panicled, calyxes two-flowered, awn twice as long as the ſeed, culm branchy, ſtipeform." Their produce on bad land is ſeldom leſs than four quarters, and on good land they will yield fourteen or fifteen. Hops are cultivated to a conſiderable extent in the central parts of the county, about Ollerton, and indeed in moſt places of the "north clay," by which diſtinctive appellation they are generally known among traders. Mr. Lowe informs us, that theſe hops are much ſtronger than the Kentiſh, "going almoſt as far again in uſe;" but thoſe who are accuſtomed to the latter, object to their flavour as rank; a circumſtance which of courſe operates againſt them in the market. At Scrooby, and a few ſpots in the northern diſtrict, weld, ſometimes called the dyers' weed, has likewiſe been long an object of culture. It is commonly ſown with the barley and clover, at half a peck to an acre; and is pulled up from among the clover the year following, about the time when the latter is coming into bloom.

Few cattle are bred in this county, except on the banks of the Soar, where a number of cows are reared for the dairy. Sheep, however, are bred in great numbers, in almoſt every diſtrict. They are chiefly the old foreſt kind, or croſſes of that breed with the Lincolnſhire and new Leiceſterſhire breeds. The old foreſt ſheep, when without mixture, are deſcribed as a ſmall polled race, with grey faces and legs, the fleeces of which may run from 13 to 18 to the tod of 28 pounds. The carcaſes, when fat, weigh from ſeven to nine pounds a quarter; but as the croſſes have been found to be great improvements both on the wool and carcaſe, few farmers now rear this ſpecies of ſheep unmixed.

*State of Property, &c.*—Tenures here, as in moſt other counties, are in all the variety of freehold, copyhold, and leaſehold; and there is alſo a very conſiderable portion of church and collegiate lands. The freeholds are more extenſive than numerous; and with reſpect to the copyholds, a great part of the ſmall ones are "Borough Engliſh," and deſcend to the youngeſt ſon. The immediate occupants of the ſoil are moſtly tenants at will; and as their farms, in many inſtances, have continued in one family for ſeveral generations, they feel a ſort of hereditary ſecurity, that prompts them to the ſame courſe of improvement as if they were ſecured by leaſes.

Generally ſpeaking, the farms may be characteriſed as ſmall, few of them exceeding 300*l. per annum*, and more being under 100*l.* than above that ſum; many, indeed, eſpecially in the clay diſtrict, being as low as 20*l.* The largeſt farms are on the poor foreſt lands, which have been lately brought into a ſtate of cultivation. Rents are univerſally paid in money; reſerving only ſome few boons, as they are provincially called, *i. e.* obligations to perform ſome carriage work (chiefly of coals) for the landlord. Tithes are in ſome places taken in kind, but are more frequently compounded for, at a much lower rate than they would be valued at by any ſurveyor. In the new incloſures, land has univerſally been given in lieu of tithes; and all the lands which are either now, or have been formerly church lands, are entirely tithe free. Eſtates vary in extent from 12,000*l.* a-year downwards to the ſmalleſt amount. The largeſt, as is uſual in moſt counties, are left to the care of ſtewards; but many conſiderable as well as inferior yeomen occupy and farm their own properties.

*Mineralogy.*—In a mineralogical eſtimate, Nottinghamſhire has nothing particularly worthy of attention. No metals of any deſcription have hitherto been diſcovered within its boundaries. Coal and lime-ſtone, however, are tolerably abundant, as well as marle and free-ſtone. Both the coal and lime-ſtone ſtrata lie on the weſtern ſide of the county. The former occupy a line of conſiderable extent, but not more than a mile in breadth. The ſeams, however, are very prolific, and the coal being of a good quality, is conſequently wrought with great advantage to the proprietors. But the ſame remark cannot be applied to the lime-ſtone, which is for the moſt part of an inferior kind, and only fit for the purpoſes of manure. At Mansfield are ſome excellent quarries of a yelloviſh free-ſtone, well adapted for building and paving; and there is alſo at this place a red kind, capable of being formed into ciſterns and troughs. At Maplebeck is a blueiſh ſtone for building, which has the property of becoming white upon expoſure for a ſhort time to the action of the air. Beacon-hill, near Newark, is remarkable for a kind of blueiſh ſtone, for hearths, which takes ſo fine a poliſh, as frequently to be miſtaken for marble; and at Linley is a coarſe paving ſtone, much uſed in paving the ſtreets of Nottingham. The quarries on this hill alſo produce vaſt quantities of gypſum, alabaſter, or plaſter, as it is commonly called by the inhabitants. The ſame material is likewiſe abundant in many other places, and in greater variety, and of a ſuperior quality to that found in almoſt any other county of England. Marle is diſcovered throughout the whole extent of the clay diſtrict, but being no where uſed as a manure, except in one or two farms near the banks of the Trent, it is very little dug up. Mr. Lowe indeed ſays, that he is ignorant of any marle-pit opened within the county, but that at Bank-wood in the Trent Bank diſtrict.

*Rivers.*—The rivers which either take their riſe in Nottinghamſhire, or flow through it, are numerous, and a few of them are very conſiderable ſtreams. The Trent, which has its ſource near Biddulph, in Staffordſhire, enters this county in the vicinity of Thrumpton with a bold and rapid current, and croſſing it in a north-eaſterly direction by Nottingham and Newark, where its ſtream ſweeps decidedly to the north, reaches Clifton, and becomes the boundary between this county and that of Lincoln, for a diſtance of more than twenty miles. This river is navigable for large veſſels as high as Gainſborough, eight miles above Weſt-Stockwich, at which village it leaves Nottinghamſhire; and flat-bottomed ſmall craft of thirty or forty tons burden may navigate its whole courſe through the county. The Erwaſh forms the boundary between the ſhires of Nottingham and Derby, and falls into the Trent near Barton; as does likewiſe the Soar, which flowing from the ſouth divides this county from that of Leiceſter. The Mann and the Meaden, uniting their currents near Elkeſley, after receiving ſeveral ſmaller ſtreams, form the Idle, which runs in a northerly direction

direction by Retford and Matterſey to Bawtry, where it turns to the eaſt, and traverſing Miſſon-Car joins the Trent in the northern angle of the county. The other rivers in Nottinghamſhire are the Wollen, the Workſop, the Dover, the Greet, and the Leen, but none of them poſſeſs any features ſufficiently intereſting to claim particular deſcription.

*Canals.*—In this county are four principal canals, beſides a number of collateral branches to different ſmall towns and works. Theſe are the Cheſterfield canal, the Nottingham canal, the Idle River canal, and the Grantham canal. The Cheſterfield canal derives its name from the town of Cheſterfield, where it commences, and after a circuitous courſe within Derbyſhire, enters this county near Shire-oaks, and continues by Workſop through the northern limits of Sherwood-foreſt to Retford. It paſſes through the townſhips of Welham, Clarborough, Hayton, Clayworth, Everton, and Drakelow, at which place it runs under a tunnel of two hundred and fifty yards, and thence round Gringley-on-the-Hill to Miſterton, acroſs Walkeringham-moor, and thence into the Trent at Stockwich. The whole line of this canal is upwards of forty miles in length. Its riſe from Cheſterfield to Norwood is about forty-five feet; and thence to the Trent it has a regular fall of three hundred and thirty-five feet. The Nottingham canal extends about fifteen miles through the county in a north-weſt direction, but not exactly in a right line. It commences in the river Trent, and proceeds to the Cromford canal, near Langley-bridge, cloſe to the termination of the Erwaſh canal; and it is alſo connected with the Grand Trunk canal. A reſervoir has been formed at Arnſwirch with a ſelf-regulating ſluice, which lets off 3000 cubic feet of water in an hour. This canal was firſt opened for navigation in 1802; and the principal object for which it was conſtructed, was the export of agricultural produce, and of coals from the various mines in its vicinity. The Idle River canal is more properly a river navigation than a cut. It commences at Bawtry, and runs nearly due eaſt for ten miles along the northern verge of the county. In one part of its courſe it is denominated the Bycar Dyke canal; and half a mile from its junction with the Trent is Miſterton-ſluice. The Grantham canal, ſo called from its commencing at that town, in Lincolnſhire, after paſſing through Leiceſterſhire enters this county about a mile from Hicking, and croſſing the Wolds flows in a very circuitous line by Owthorpe and Cropwell-Biſhop, till its junction with the Trent. The proprietors of the Grand Trunk canal, having been at conſiderable expence in deepening the river near the entrance of this canal, are entitled to take certain tolls on all goods paſſing from it to the Nottingham canal. At Cropwell-Biſhop a branch leads off from the Grantham canal to the town of Bingham.

*Foreſts.*—In this county is the foreſt of Sherwood, which in ancient times was of conſiderable celebrity, particularly as the ſcene of the exploits of Robin Hood, &c. See SHERWOOD.

*Commerce and Manufactures.*—The malting buſineſs is carried on here to a great extent, eſpecially at Nottingham, Newark, and Mansfield. A great deal of malt is ſent by the Trent and by the canals into Derbyſhire, Cheſhire, and Lancaſhire. At Newark are great breweries, which rival thoſe of Burton-upon-Trent. The ſtocking trade may be regarded, however, as the ſtaple of the county. The firſt frame for making ſtockings is ſaid to have been invented by one Lee, a native of Calverton. This buſineſs occupies a vaſt number of hands at Nottingham, and at the ſurrounding villages, and alſo at Southwell. Many cotton-mills, worked by water, to prepare the thread for the Mancheſter goods, and for ſtockings, have been eſtabliſhed at Garnſton, Lowdham, Papplewick, Southwell, Newark, Fiſkerton, Mansfield, and Basford. At Cuckney is a mill for combing wool, another for ſpinning worſted, and a third for poliſhing marble. At Arnold is a large woollen-mill; and at Retford is another for the ſame purpoſe, both of which are worked by ſteam. At Nottingham are ſeveral ſilk-mills, alſo an extenſive manufacture of thread lace and Britiſh lace; though, unfortunately, this laſt branch of trade, as well as the ſtocking manufacture, has ſuffered much by the late commotions in this county. Mansfield is remarkable for its trade in ſtone; and at Sutton-in-Aſhfield are conſiderable potteries of coarſe red ware. A ſtarch manufactory is now carried on at Upton, near Southwell; a ſail-cloth manufactory has been long in a flouriſhing condition at Retford; and the dyeing and bleaching trade has been attempted, with conſiderable ſucceſs, at Nottingham and at Newark. The exports of the county conſiſt of moſt articles of its produce or manufacture; and its chief imports are timber, flax, hemp, iron, cotton, wool, and yarn, with, in general, all ſuch articles as are not found or manufactured within its boundaries.

*Civil and eccleſiaſtical Diviſions and Government.*—Nottinghamſhire is politically divided into ſix hundreds, or wapentakes, which include eleven market-towns, and 160 pariſhes. The towns are Nottingham, Newark, Mansfield, Bingham, Workſop, Tuxford, Ollerton, Eaſt-Retford, Bawtry, Blythe, and Southwell, accounts of which will be found under their reſpective names.

The eccleſiaſtical government of this county is now under the ſee of York; but it had formerly, even ſo late as the reign of Elizabeth, a biſhop of its own. At preſent it conſiſts of an archdeaconry, and four deaneries: Nottingham, Bingham, Newark, and Retford. Of the pariſhes and chapelries, 182 are within the juriſdiction of the archdeacon, 28 belong to the church of Southwell, and ſeven are under the patronage of the dean and chapter of York.

The *antiquities* of Nottinghamſhire are neither ſo numerous nor ſo important as in moſt of the central counties of England. The only Britiſh camp is that at Barton, about four miles ſouth-weſt of Nottingham; but at Oxton there are three large tumuli, one of which was opened by the late major Rooke, and found to contain an iron urn, filled with aſhes and burnt bones, a large ſword with a wooden ſcabbard, two daggers, and a great variety of glaſs beads. On the ſummit of the hills, called Robin Hood's hills, is a ſeat cut out of the ſolid rock, which is ſaid by ſome to have been the work of Robin; but others regard it as of much higher antiquity. Roman remains are more frequent than Britiſh; and no doubt that people had many ſtations within this county, of which the principal were Verometum near Willoughby, Margidunum near Bingham, and Segelocum at Littleborough. Crocolana was ſituated on the verge of the county, partly within it and partly in Lincolnſhire. The two firſt mentioned ſtations were ſituated on the Foſſeway, which, entering the county from Leiceſterſhire, croſſes the Ermin-ſtreet from London to York. This road may be eaſily traced for many miles along the wolds, and is literally a foſſe. In the foreſts are many veſtiges of military roads, which run invariably in a north-weſt direction, and have exploratory camps ſituated, at intervals, cloſe to them. On Holly-hill, near Arnold, in Sherwood foreſt, may be ſeen a very large encampment, ſuppoſed to have been the central depôt of the Roman forces in this diſtrict, as, from its height, it commands a view over all the exploratory camps around. Gale conjectured that Nottingham was the Cauſennis of Antoninus, but without ſufficient authority. Some notices of the caves in the vicinity of that town will be found under

under the article NOTTINGHAM. General View of the Agriculture of the county of Nottingham, &c. by Robert Lowe, eſq. of Oxton, 8vo. London edit. 1798. The Antiquities of Nottinghamſhire, with Maps, Proſpects, and Portraitures, London, 1677, folio, by Dr. Thoroton.

NOTTURNO, Ital. a night-piece. About the middle of the laſt century, the notturni à 4, of Martini, of Milan, were deſervedly in high favour.

NOTZENDORF, in *Geography*, a town of Pruſſia, in Pomerelia; 7 miles E. of Marienburg.

NOÜ, a town of Hindooſtan, in the ſubah of Delhi; 20 miles W.N.W. of Coel.

NOVA, or AD NOVAS, in *Ancient Geography*, a town of Mauritania Tingitana, upon the route from Tocoloſida to Tingis, according to the Itinerary of Antonine, between Oppidum Novum and Ad Mercurii; 32 miles from the firſt, and 12 miles from the ſecond.

NOVA, in *Geography*, a ſmall iſland in the Atlantic, near the coaſt of Braſil. S. lat. 0° 4′. W. long. 50° 30′.

NOVA *Zembla*. See ZEMBLA.

NOUA, an iſland near the W. coaſt of Eaſt Greenland. N. lat. 60° 45′. W. long. 47°.

NOVAC, a town of Iſtria; 15 miles N.E. of Rovigno.

NOVACULA PISCIS, the *Razor-fiſh*, in *Ichthyology*, the name of a ſea-fiſh caught in the Mediterranean, and ſome other ſeas, and much eſteemed at the tables of the great.

It is a ſmall fiſh, ſeldom exceeding three or four inches in length, and, in its flat ſhape, ſomewhat reſembles the faber. It keeps about the ſhores, particularly ſuch as are ſtony, and ſeems never to go into deep water; and is caught on the ſhores of Majorca, Minorca, the iſland of Malta, and elſewhere, and lives on ſmall fiſh. Salvian. de Aquat. See CORYPHÆNA *Novacula*.

NOVACULARUM LAPIS, in *Natural Hiſtory*, the name given by De Laet to a ſtone which he deſcribes from Ximenes, who has it under the American name *iztli*.

It is the ſtone out of which the natives of America made their weapons of war, and tools for other uſes of life, before they knew the uſe of iron.

There are three ſpecies of this ſtone, the one blue, the other white, and the other black: they are all capable of a very high poliſh, and, when ſet in gold or ſilver, are very highly eſteemed by the natives: they reflect the images of things, in the manner of all other highly poliſhed bodies, and the two firſt are conſiderably tranſparent.

There are ſeveral quarries of theſe ſtones in the neighbourhood of Mexico, whence the Indians uſed to get them; they naturally ſplit, in the getting out, into angular and edged figures, and theſe they afterwards faſhioned to the purpoſes they wanted them for, and poliſhed with the powder of a harder ſtone.

They ſtill make knives of them, in a very expeditious and very remarkable manner. They hold the maſs of ſtone between their feet, and, with an inſtrument prepared on purpoſe, they cut off pieces of four or five inches long, and about an inch broad, riſing to a prominence on each ſide in the middle, and growing very thin toward the edges: it is wonderful to ſee with what expedition they finiſh this odd workmanſhip. The knives, when made, are ſharper than any other inſtrument in the world; but they are very tender, eaſily broken, and more eaſily battered, and notched at the edges. They make alſo longer weapons of the ſame ſhape out of this ſtone, which they fix into wooden handles, with a ſort of gum; and theſe ſerve them as ſwords. They are very terrible weapons for one blow, but they ſeldom hold together ſo as to bear a ſecond. They make alſo the heads of their arrows with them; and, when theſe were firſt found by our travellers, they were not ſuppoſed to be of human workmanſhip, but to have fallen from heaven in thunder, and were called by many authors *ceraunia*. Ximenes, Hiſt. Ind. Occid. lib. x. cap. 13.

NOVÆ, in *Ancient Geography*, a town of Lower Mœſia, upon the route from Viminiacum to Nicomedia, according to the Itin. Anton., between Dimon and Scaidava; 17 miles from the former, and 18 from the latter.—Alſo, a town of Upper Mœſia, upon the route from Viminiacum to Nicomedia, between Cuppæ and Talia; 24 miles from the former, and 32 from the latter.—Alſo, a town of the ſecond Pannonia. It is placed by Antonine, in his Itinerary, along the coaſt of Gaul, on the route from Tauranum between Murſa and Antianæ; 24 miles from the former, and 23 from the latter.

NOVÆ, or *Ad Novas*, a town of Macedonia, upon the route from Hydrus to Aulon, between Apollonia and Claudianæ; 24 miles from the firſt, and 25 from the ſecond.

NOVAIA, in *Geography*, a town of Ruſſia, in the government of Tobolſk, on the Irtiſch; 100 miles E.S.E. of Tobolſk.

NOVALE, a town of Italy, in the Treviſan, on the Muſone; containing ſeveral churches, a convent, palaces, and about 1200 inhabitants; 10 miles S. of Trevigio.

NOVALE, in our ancient cuſtoms, denotes land newly ploughed, and converted into tillage; and which had not been tilled within the memory of man before.

"Quod novale ſemel fuit, ſemper erit novale quoad decimarum retentionem vel ſolutionem." What was once novale, will ever remain ſo, as to the paying or non-paying of tythes. "Excepta decima novalium cujuſdam terræ, quam de novo excoluerunt." Pat. 6. Edw. III.

NOVALE is ſometimes alſo uſed for fallow land, *i. e.* land which has been ploughed for two years, and reſts, or lies fallow, one more; or that lies fallow every other year.

NOVALESE, in *Geography*, a town of France, in the department of Mont Blanc; 6 miles W.N.W. of Chambery.—Alſo, a town of France, in the department of the Po, ſituated on the river Doria; 5 miles N. of Suſa.

NOVALLERA, a town of Italy, in the department of the Panaro, and capital of a ſmall principality, held as a fief of the empire by the duke of Modena; 9 miles N. of Reggio.

NOVANAGUR, a town of Hindooſtan, in Guzerat; 30 miles S.S.E. of Puttan Sumnaut.

NOVANTÆ, in *Ancient Geography*, one of the 22 Britiſh nations which, according to Ptolemy, occupied the territory S. of the wall of Antoninus, between the friths of Forth and Clyde, ſtationed near the peninſula called Novantum, now the Mull of Galloway. They poſſeſſed, according to Camden, the countries of Galloway, Carrict, Kyle, and Cunningham. Baxter ſuppoſes they were called Novantæ, from the Britiſh word "Now heat," new inhabitant, and that they had come originally from the neighbouring coaſts of Ireland. He farther obſerves, that their more modern name of Gallowadians alſo implies, that they were ſtrangers. Their towns were Lucopibia, or Lukoikidion, ſignifying the ſame with Candida Caſa in Latin, and Whithern in Saxon, and deriving its name from a cuſtom of the ancient Celts, of white-waſhing their chief buildings; and Religionum, Retigonium, or, as Camden and Baxter imagine it was written, Beregonium, being Bargeny in Carrict.

NOVARA, in *Geography*, a town of France, in the department of Marengo, and capital of a country, called "Novareſe," in the duchy of Milan, the ſee of a biſhop, ſuffragan

ſuffragan of Milan. It contains, beſides the cathedral, 17 pariſh churches, and 18 convents. This town was taken in 1797 by the French; 8 miles N.E. of Vercelli.

NOVARIA, Novarre, in *Ancient Geography*, a town of Italy, in Gallia Tranſpadana, towards the north. Tacitus ranks it among the municipal cities of Gallia Tranſpadana; and ſome have given it to the Inſubrians.

NOVARINI, Lewis, in *Biography*, a learned Italian Theatin monk, who flouriſhed in the 17th century, was a native of Verona, where he was born in the year 1594. He entered among the Theatins when he was about eighteen years of age, and was ſent to paſs his noviciate at Venice, and took the vows in 1614. He afterwards ſtudied philoſophy and divinity, and was ordained prieſt in 1621. Among other departments which he occupied, was that of counſellor of the Inquiſition. He was deeply learned in the Oriental languages, and enjoyed the eſteem of the princes and learned men of his time. He died at Verona in the year 1650, at the age of 56. He was author of a vaſt number of works, of which a long liſt is given in the 40th volume of father Niceron's Memoires. The principal of theſe works are; "Comment. in quatuor Evangel. et Acta Apoſtol." in 4 vols. fol.; "Adagia Sanctorum Patrum," in 2 vols. fol.; "Electra Sacra, in quibus quà ex Latino, Græco, Hebraico, et Chaldaico fonte, quà ex antiquis Hebræorum, Perſarum, Græcorum, Romanorum, aliarumque Gentium ritibus, quædam divinæ Scripturæ loca noviter explicantur et illuſtrantur," in 3 vols. folio. Moreri.

NOVA SCOTIA, in *Geography*. See *Nova* Scotia.

NOVATIANS, Novatiani, in *Eccleſiaſtical Hiſtory*, a ſect of ancient heretics, that aroſe towards the cloſe of the third century, ſo called from Novatus, an African biſhop; or from Novatianus, a prieſt of Rome.

They were called alſo Cathari, from καθαρὸς, *pure*, q. d. Puritans.

Novatian firſt ſeparated from the communion of pope Cornelius, on pretence of his being too eaſy in admitting to repentance thoſe who had fallen off in times of perſecution.

Novatus coming to Rome, joined himſelf to the faction of Novatian; and both maintained, that there was no other admiſſion into the church but by the repentance in baptiſm; grounding their opinion on that of St. Paul: "It is impoſſible for thoſe once enlightened, and who have taſted the heavenly gift, if they fall away, to renew themſelves by repentance."

Not that they denied but a perſon fallen into any ſin, how grievous ſoever, might obtain pardon by repentance; for they themſelves recommend repentance in the ſtrongeſt terms: but their doctrine was, that the church had it not in its power to receive ſinners into its communion; as having no way of remitting ſins but by baptiſm; which, once received, could not be repeated.

In proceſs of time the Novatians ſoftened and moderated the rigour of their maſter's doctrine, and only refuſed abſolution to very great ſinners.

The two leaders were proſcribed, and declared heretics, not for excluding penitents from communion, but for denying that the church had a power of remitting ſins.

NOVATION, Innovation, in the *Civil Law*, denotes a change or alteration of an obligation, whereby it becomes extinguiſhed or annihilated.

Thus, when an obligation is diſcharged without receiving any money, but a ſimple promiſe is accepted in its ſtead, this occaſions a novation.

There are two notations; the one *voluntary*, the other *neceſſary* and conſtrained.

Novation, *Neceſſary*, is that made in conſequence of a ſentence or decree of juſtice.

Novation, *Voluntary*, is made three ways; *viz.* by changing the cauſe of the obligation, without the intervention of any other perſon; by changing the nature of the obligation; and by delegation, as when the debtor makes over a debt to the creditor for his ſatisfaction.

In all theſe caſes there is a will to innovate. Accordingly, Juſtinian ſays, "Voluntate, non lege, novandum."

NOVAVOL, in *Geography*, a town of Samogitia; 40 miles S. of Roſienne.

NOUCONGUE, a mountain of Thibet. N. lat. 30° 54'. E. long. 94° 54'.

NOUDJER, a town of Hindooſtan, in the circar of Ellore; 20 miles W. of Ellore.

NOUE, Francis de la, in *Biography*, ſurnamed *Braſde-Fer*, an eminent warrior and ſtateſman, was born in 1531, of an eminent family in Brittany. He was brought up to the profeſſion of arms, and became diſtinguiſhed in Italy. On his return to France, he embraced the Calviniſtic religion and party, of which he became a principal ſupporter. In 1567 he reduced Orleans, commanded the rear guard at the battle of Jarnac in 1569, and afterwards took Fontenoi, and ſeveral other places. At the capture of Fontenoi he received a wound which occaſioned the loſs of an arm, and he ſupplied its place with one of ſteel; with this he was ſoon able to manage his bridle, and hence he obtained his ſurname. He was in the Low Countries in 1571, and ſurprized Valenciennes; and returning after the maſſacre of St. Bartholemew, he was appointed by the king to the command of the troops ſent againſt Rochelle. "On this occaſion," ſays his biographer, "his attachment to his party, enforced by the juſt reſentment he might feel for the late execrable maſſacre, overcame his ſenſe of fidelity to his ſovereign, and he carried into Rochelle for its defence the forces deſigned for its reduction." We much doubt whether this can be admitted as a juſtification of his conduct as a ſoldier and man of honour. It is however more to his credit, that he uſed all his intereſt during the ſiege to promote an accommodation upon honourable terms. In 1678 he followed the duke of Alençon into the Low Countries, and rendered great ſervices to the States-General. He took Ninove, with count Egmont, who commanded it, but was himſelf made priſoner in 1680. The Spaniards thought this capture of ſo much importance, that they detained him in captivity five years, which he employed in literary purſuits. At the commencement of the wars of the League he retired to Geneva; when Senlis was beſieged by the leaguers in 1589, he was with the army of Royaliſts which attempted to throw proviſions and ammunition into the place, and when the merchants refuſed to deliver their goods without an advance of money, La Noue immediately mortgaged his eſtate for the required ſecurity. He continued to ſerve with glory under Henry IV., and in 1691 was killed by a muſket-ſhot at the ſiege of Lamballe, as he was reconnoitering. He was ſincerely regretted by both parties, and it is believed that few purer characters are to be met with in the hiſtory of thoſe times. He openly and courageouſly declared againſt the practice of duelling, at that time exceedingly prevalent, and held it as a crime to hazard in perſonal quarrels that life which ought to be devoted to the public ſervice. He was the author of "Diſcours Politiques et Militaires," compoſed in priſon, and printed in 1587. His ſon was a writer and a brave ſoldier. He died in 1618, leaving behind him ſome religious poems, which were afterwards printed at Geneva. Moreri.

Noue, Stanislaus-Louis de la, count de Vair, was of

of the ſame family as the preceding, and born in 1729. He greatly diſtinguiſhed himſelf as a gallant officer in the war of 1741, and alſo in that of 1756. He was ſlain in the action of Saxenhouſen in 1760. Lewis XV. being told of his death, ſaid that "he had loſt the Loudon of France." The count wrote "New Military Conſtitutions," printed at Frankfort in 1760.

Noue, John-Sauve de la, a French actor and dramatic writer, was born at Meaux in the year 1701. The duke of Orleans aſſigned to him the direction of his theatre at St. Cloud, and Voltaire wrote ſome pieces purpoſely for him. He died in 1761. His tragedies and comedies were publiſhed at Paris in 1765.

NOVEL, Novella, in *Juriſprudence*, is a term uſed for the conſtitutions of ſeveral emperors; *viz.* Juſtin, Tiberius II., Leo, and particularly Juſtinian.

Moſt of Juſtinian's Novels were originally Greek, and afterwards were tranſlated into Latin. Their number is 168, compriſed in nine collections or chapters. See Civil *Law*.

They had their name novel, either from their making a great alteration in the face of the ancient law; or, as Cujas rather thinks, becauſe made on new caſes not yet conſidered; and, after the reviſal of the code, compiled by order of the emperor.

Wherever Accurſius ſpeaks of novels, he means thoſe publiſhed in Greek by Juſtinian: the Latin verſion of them, made in the time of Bulgarus, he calls *Authentics*, by reaſon of its exactneſs and fidelity.

Novel, in *Matters of Literature*, a fictitious hiſtory of a ſeries of ſurprizing and entertaining events in common life, wherein the rules of probability are, or ought to be, ſtrictly obſerved; in which it differs from a romance, where the hero and heroine are ſome prince and princeſs, and the events which lead to the cataſtrophe are, in general, highly abſurd and unnatural.

After a general change in the manners of Europe, a diſbelief in magic and enchantments, the abolition of tournaments, and the prohibition of ſingle combat, had deſtroyed or greatly weakened the fondneſs for romances of chivalry, a ſecond ſpecies of romance writing took its riſe. In this there were no longer introduced dragons, necromancers, or enchanted caſtles, but with them was not entirely baniſhed abſurdity of incident and improbability of character. This ſecond ſpecies of fictitious writing did not continue long: the age was becoming too refined, and the taſte for literature too general and extenſive, for works to pleaſe in which the characters were ſtrained, the ſtyle turgid and declamatory, and the adventures incredible. This ſort of compoſition now aſſumed a third form, and from the magnificent romance, dwindled down to the familiar novel. When the novel firſt appeared in England and France, during the reigns of Louis XIV. and Charles II., it was made the vehicle for profligate adventures, and for the diſplay and recommendation of looſe and immoral character. Since that time, imitations of life and manners have been their principal object, and though their moral or beneficial tendency may often be queſtioned, yet their profeſſed object is to inſtruct as well as to amuſe.

Mrs. Barbauld, in her obſervations on the life and writings of Richardſon, remarks, that novels may be diſtinguiſhed into three claſſes, according to the mode and form of narration adopted by the author: the firſt is the narrative or epic form, in which the whole ſtory is put into the mouth of the author, who is ſuppoſed to know every thing; the ſecond is that in which the hero relates his own adventures; and the third is that of epiſtolary correſpondence, in which all the principal characters of the novel relate the events in which they were moſt concerned. This laſt mode appears to have originated with Richardſon. With reſpect to the advantages and diſadvantages of theſe different modes, and the comparative probability of a perſon ſitting down, after his adventures were finiſhed, to give an account of them to the public, and of his diſpatching a narrative of every intereſting occurrence, immediately after it happened, to his friends by the poſt, Mrs. Barbauld enters into a minute inveſtigation. It is probably a queſtion of little moment, ſince, if the novel be intereſting and well written, the reader will not be diſturbed in the middle of the ſtory, by any curioſity or ſcruple about the means or the inducements which the narrator may have had for telling it. Perhaps the firſt of theſe modes, the author's own narrative, is the moſt eligible, as it gives him greater ſcope, and allows him to introduce greater variety in his mode of narration, and in his ſtyle. The epiſtolary ſtyle, however, is beſt adapted to that ſpecies of novel in which the characters, and not the adventures of the perſons introduced, are intended principally to rouſe, and fix the intereſt of the reader; it is, therefore, employed with great propriety and effect by Rouſſeau, in his Heloiſe.

The French undoubtedly excel all other nations in this ſpecies of writing; if its chief excellence and merit conſiſt in drawing characters with delicacy, in exquiſite refinement of thought, and in great penetration into human nature. The Engliſh novel writers are more diſtinguiſhed by their ſkill in painting manners than character, and by their humour, rather ſtrong and coarſe, than chaſte and elegant. The German novel writers, in general, diſplay force and wildneſs of genius; a deep tincture of ferocity; and a diſpoſition to carry every feeling and ſentiment to the utmoſt poſſible degree of extravagance and exceſs. Their opinions reſpecting morality are of a ſingular nature, and of a very queſtionable tendency: it might almoſt be ſuſpected that their object was to recommend vice, or crime, by exhibiting it united with great vigour of mind, ſplendour of genius, and even with ſome intereſting and attractive virtues.

The Gil Blas of Le Sage is filled with great knowledge of the world; and is evidently the work of a man who had ſtudied human nature, under certain circumſtances, with great attention and ſkill: but his turn for ſatire is ſo ſtrong and predominating, that a tinge of caricature runs through the whole work. One of the chief advantages and excellencies of Gil Blas, conſiſts in the correct and animated view which is given throughout it, of the manners and habits of life, in Spain, during that period when the action is laid; nor is it poſſible to conceive a more ſtriking and juſt picture than it exhibits, of the corruption of juſtice, of the extreme lazineſs and profligacy of the grandees, and of profeſſional pedantry, preſumption, and unſkilfulneſs. In this reſpect Le Sage may be regarded as having ſupplied a too common omiſſion of the hiſtorian, who paſſes over the changes of human manners and character, and confines his attention to thoſe events and circumſtances only, which intereſt or benefit the politician.

But the novels of Le Sage do not preſent a faithful picture of the characteriſtic qualities and excellencies of the French authors in this ſpecies of writing. In this point of view Marivaux claims our attention in a very ſuperior degree: in his Marianne, particularly, he ſeems to have penetrated into the very receſſes of the human heart, while he lays open thoſe moſt ſecret motives, which, even though they influence the conduct, are not known or recognized by the agent in all their force and bearings. Perhaps his fault conſiſts in being too minute and refined in tracing the motives and painting the feelings of his character. The novels of Florian have

more ſimplicity than thoſe of Marivaux, while they are equally intereſting from the ſkill with which the narrative is conducted, the vividneſs and animation with which the incidents are related, and the faithful portraits which they exhibit of human nature, in ſome of its moſt pleaſing and amiable forms.

Rouſſeau's novels, as well as thoſe of Le Sage, form exceptions, in ſome very important reſpects, to thoſe of the French ſchool of novel writers; but the difference is of a very different nature; and even in the moſt ſplendid and eloquent parts of Rouſſeau's novels, the characters of the French ſchool may be traced. He does not indeed paint his characters by minute and laboured features: but with the hand of genius, he ſtrikes off the portrait, by the rapid and flowing exhibition of thoſe features, on which the ſoul is moſt ſtrongly expreſſed. His novels alſo are uncommonly intereſting, from the inſight which they afford into the author's own character; though there is ſo little appearance of art in his writings, that the idea of the ſkill or talents of the writer does not croſs our mind, or break in upon our thoughts or feelings, while we are warm in the peruſal; yet we no ſooner lay down the book, than a ſtrong impreſſion of the peculiar character of the author forces itſelf on our mind. In every thing which he wrote, but eſpecially in his Heloiſe, we diſcover extreme and exquiſite ſenſibility, a romantic and viſionary turn of mind, and genius of the higheſt order and pureſt nature. In his Heloiſe, there are, no doubt, conſiderable faults; in what Rouſſeau intended for the philoſophical parts, there is much ſophiſtry, and not unfrequently a tedious and obſcure weakneſs of argument. The ſtyle of the letters, alſo, is not ſufficiently varied, in the leſs impaſſioned parts: he did not, indeed, ſucceed nearly ſo well in the diſplay of reaſoning and calm, as of feeling and impaſſioned character. But with all theſe deductions from its merit, the Heloiſe muſt be ranked among the moſt ſucceſsful and ſplendid creations of human genius; and there are paſſages in it, which for power of eloquence, for refinement and tenderneſs of ſentiment, for ardour of paſſion, and for exquiſite delineation of character, cannot be paralleled in any other writer.

The circumſtances which gave riſe to this moſt extraordinary work are detailed by Rouſſeau in his memoirs; and as they are extremely intereſting, from the diſplay which they exhibit of the workings of his imagination, and the extreme and morbid ſenſibility of his feelings, we ſhall briefly detail them. Tired of Paris, he withdrew to a ſmall country houſe near it; where he ſhut himſelf completely up from all viſitors, indulging his taſte for ſolitude and viſionary enjoyments. Here he deſcribes himſelf as having been ſeized with the moſt violent propenſity to love; but as his age and ſituation precluded him from having a real miſtreſs, he created an imaginary one, whom he adorned with every charm that a flowing and moſt creative fancy could ſupply. At length he commenced a correſpondence with his imaginary miſtreſs; and the letters, thus written, pleaſed him ſo much, that he determined to publiſh them. As, however, the ſentiment which they expreſſed, and the feelings which they diſplayed, were very oppoſite to the ſevere and ſtern maxims which he had formerly inculcated, he was, at firſt, at a loſs for a juſtification of his conduct in publiſhing them. Here, again, his imagination, and his diſpoſition to ſophiſtry, came to his aid: he perſuaded himſelf that the times were ſuch, that the Heloiſe would be more uſeful than works conducted with a ſtricter regard to morality. He did not conceal from himſelf the objections that might be made to it, nor the effects that it might produce; but he urges, that the diſorder of which it preſents an example was leſs dangerous and criminal than that which had become common in France: as, therefore, he deſpaired of freeing human nature from vice, he reſolved to content himſelf with ſubſtituting one ſpecies of crime for another. He argues too, that in the generality of fictitious writings, the ſtandard for imitation had been raiſed too high; that it thus created deſpair, not emulation; but that in his Heloiſe, human nature is exhibited only with that degree of perfection which all may attain to, while the nature of the perfection, and the circumſtances under which the characters are exhibited, will naturally inſpire a wiſh to imitate them.

The novels of Richardſon are of a very peculiar character; and as they cannot be ſtrictly claſſed with any other Engliſh novels, it will be neceſſary to conſider them by themſelves, and at ſome length. Certainly his great excellence conſiſts in the extreme minuteneſs and fulneſs of his deſcriptions; and in the pains which he takes to make his readers moſt intimately acquainted with the character and feelings of the perſonages with whom they are occupied. Inſtead of hurrying over the preparatory ſcenes, and reſerving the whole of the reader's attention for thoſe parts, when a grand diſplay of incident is to be brought forward, or the working of ſome great paſſion is to be pourtrayed, Richardſon introduces his readers into the domeſtic privacy of his characters, and every thing that is ſaid or done, is thus, as it were, heard and ſeen by them. The reſult is, that we take an intereſt in all the perſonages, and almoſt acknowledge them as our moſt intimate acquaintance. In order to effect this, Richardſon has been obliged to enter into prolix deſcriptions, and to repeat rambling and tedious converſations: in the midſt of theſe, the reader is frequently tired or diſguſted, but they nevertheleſs leave on his mind a more diſtinct idea of the character of the perſonages, and give them a ſtronger hold, not only on his curioſity, but his intereſt. When, therefore, any thing important or diſaſtrous occurs to them, we feel as for old friends and companions, and are irreſiſtibly led to as lively a conception of their ſenſations, as if we were actually preſent. By this means Richardſon has the advantage of bringing readers, already intereſted in the higheſt degree, to the peruſal of thoſe ſcenes, where his knowledge of the human heart, and his powers of pathetic deſcription, are brought forward to the greateſt advantage and effect.

With all the merits of Richardſon's novels, they have great faults: the argumentative diſcuſſions which he introduces are tedious and heavy, and diſplay no great or comprehenſive powers of mind; his wit is ſtiff and formal, evidently brought forward with much effort, and ſcarcely ever either lively or natural. His ſtyle is heavy, vulgar, and embarraſſed, devoid of eaſe, elegance, or dignity: Mrs. Barbauld has very ingeniouſly and ſatisfactorily accounted for this, from his intimacy with female ſociety and female letter-writing. With regard to the moral tendency of his works, it is probably not ſo highly rated now as it was at the time they were written: on this ſcore Pamela cannot be defended; and virtue will hardly attract in the character of ſir Charles Grandiſon, nor vice be ſo warmly and ſtrongly abhorred as it ought to be, in the character of Lovelace.

In the novels of Fielding and Smollet, the genuine character of Engliſh novel-writing appears in the moſt diſtinct and marked manner; yet theſe authors differ from each other in ſeveral important points. Fielding is remarkable, rather for humour than wit; and his humour is coarſe and ſtrong, not refined and delicate: the characters which he draws are certainly lively and natural, but they are ſuch as require rather an acquaintance with manners, and with the influence of particular

particular conditions and occupations, on the opinions, diſpoſition, and conduct, than an inſight into the more ſecret workings of the human mind and heart. This obſervation will not be deemed ſevere or unjuſt by thoſe who compare thoſe parts of his novels where his favourite characters are introduced, ſuch as oſtlers, innkeepers, waiting-maids, rogues, and female demireps, with thoſe which called for the diſplay of characters of more refined ſentiments and feelings, or acting under the influence of the more powerful emotions and paſſions of the heart. The greateſt merits of Fielding's novels, more particularly of Tom Jones, conſiſts in the exquiſite ſkill with which he conducts the fable; the ſubſerviency of every incident to the furtherance of the plot, and his art in keeping alive the curioſity of the reader. His ſtyle is languid and tame, exhibiting a good deal of pedantry and affectation; and that the digreſſions, which he introduces, are at leaſt out of place, is ſufficiently proved by the total neglect which they experience from every reader. The moral tendency of his novels is bad: benevolence, generoſity, and diſintereſtedneſs, are, no doubt, ſtrongly inculcated; but in novels, the examples which are held out have a more powerful and extenſive influence, than the leſſons which are taught, or the moral maxims which are laid down; and if his hero, in his moſt favourite novel, is diſintereſted and benevolent, it is rather from want of thought, and from the overwhelming influence of ſtrong paſſions, by no means of a virtuous deſcription, than from principle and conviction.

If we were to compare the moſt popular novels of Smollet with thoſe of Fielding, we ſhould be diſpoſed to aſcribe the higheſt degree of excellence in this ſpecies of writing to the latter. In Roderic Random, and Peregrine Pickle, manners rather than character are depicted; and in the diſplay of them, the acuteneſs of the author's obſervation is much more remarkable than its extent and variety. The humour of Smollet is ſtill coarſer than that of Fielding, and his objectionable ſcenes are brought forward with more groſsneſs; while there is none of that refined generoſity and thoſe juſt ſentiments, at leaſt of moral conduct, with which Fielding inveſts his heroes. On the other hand, the novels of Smollet, particularly Roderic Random, are more full of inſtructive knowledge of the world, and are written in a much more animated, lively, and natural ſtyle. But it is in Humphrey Clinker that Smollet appears to the beſt advantage: it is not, perhaps, going too far to aſſert, that the character of Matthew Bramble is as exquiſitely and finely drawn, as any character exhibited in fictitious writing. The idea which Smollet formed to himſelf of this character, is complete and conſiſtent in all its parts; and there is not a ſentiment uttered, not a feeling expreſſed, nor an action performed by Matthew Bramble, but what is perfectly in character. An acute and vigorous intellect, a warm and benevolent heart, are united to odd and eccentric humour, a quick irritability of temper, and a retiring ſhyneſs of diſpoſition. He is ſo afraid of being known for what he really is, that he takes as much pains to appear, and be deemed moroſe and ſelfiſh, as moſt men would do to conceal thoſe qualities. In ſhort, the character of Matthew Bramble not only diſplays an intimate acquaintance with the human heart, but alſo with thoſe peculiar manners, which ſo frequently mark out, very diſtinctly, the Britiſh philanthropiſt.

Goldſmith has written only one novel; but that, in every point of view, is an exquiſite one: while the Vicar of Wakefield diſplays almoſt unequalled humour, of the pureſt and higheſt nature, it alſo contains paſſages that are irreſiſtibly pathetic. Nothing can be conceived more perfectly drawn than his character of Doctor Primroſe; it is a truly Engliſh character, exhibited, where ſuch a character appears to the greateſt advantage, at home, by his fire-ſide, in the midſt of his family. Indeed, the great merit, and the moſt powerful and attractive intereſt of this novel, conſiſts in its diſplay of domeſtic feelings. The fable of the Vicar of Wakefield alſo deſerves much commendation; all the perſonages are conducted through their various viciſſitudes, in the moſt natural manner; the events are ſtriking, yet ſimple and probable; and the concluſion is brought about without the leaſt appearance of exaggeration or force. Of the ſtyle, it may be ſufficient to ſay, that it fully merits the praiſe which Johnſon beſtowed on Goldſmith's writings; *nihil quod tetigit, non ornavit.*

Before proceeding to the conſideration of the ſentimental claſs of novels, it may be proper, very briefly and rapidly, to characteriſe the novels of Cumberland, Moore, and Burney. Cumberland evidently imitates Fielding; but he is inferior to him in humour, in the nice delineation of manners and character, and in the ſtructure and management of his fable: while he excels him, in preſenting a more extenſive view of human life, in pathetic deſcription, and in chaſteneſs and elegance of ſtyle. It is a remarkable, unaccountable, but lamentable fact, that the "Terence of England," as Cumberland has been ſtyled, delights, in his novels, in painting ſcenes of voluptuous profligacy, equally reprehenſible with thoſe of Fielding, and much more dangerous, becauſe leſs groſs and vulgar. In the novels of Dr. Moore, great knowledge of the world, and of national character, are diſplayed; and the more difficult taſk of depicting the ſtronger paſſions, is performed with conſiderable ſkill and effect. His humour is rather dry and cauſtic, than rich and ſportive; his ſtyle is at once eaſy, natural, and animated. Perhaps his diſtinguiſhing excellence conſiſts in the almoſt total abſence of exaſperation and caricature in his perſonages; the real features of human life are drawn with ſo much diſcrimination and diſtinctneſs, that, in order to be intereſting or recogniſed, they did not require to be heightened by caricature: on this account, the novels of Dr. Moore will ſupply the place of experience more effectually, and with leſs danger of diſappointment, or being led aſtray, in actual intercourſe with the world, than the novels of any other author. Praiſe of a ſimilar nature cannot be beſtowed on the novels of Miſs Burney; caricature pervades almoſt every feature of all her perſonages, and occaſionally a ſpecies of buffoonery is indulged in, by no means conſiſtent with that purity of mind, and elegance of taſte, which ſhe generally exhibits. But with all theſe deductions from the merits of her novels, they ſtill muſt rank high; Evelina certainly in the firſt claſs; Cecilia (except in the ſerious and pathetic parts) below Evelina; and Camilla very far below both.

The general character of the German novels has been already ſketched, and when the ſentimental deſcription of novels is conſidered, it will be more particularly deſcribed. There are, however, ſome exceptions to this character among the novel writers of Germany; and Auguſtus la Fontaine deſerves in an eſpecial manner to be excepted. His Clara Dupleſſis, and his Family of Halden, deſerve great commendation; they diſplay conſiderable talents of obſervation, and an intimate acquaintance with the feelings and workings of the human heart. In his Family of Halden, he ſeems to have ſet before him as his models Sterne and Goldſmith, and he has certainly imitated them with no ſmall degree of ſucceſs; his imitation, perhaps, is in ſome reſpects improperly cloſe, as the Engliſh cait of manners is too viſible. Many of his ſubſequent novels are of very inferior merit.

About the middle of the laſt century, a new ſpecies of

fictitious writing took its riſe, called the ſentimental; it conſiſted, principally, in the expoſure and delineation of certain minute and delicate ſenſations, which either have no exiſtence, or paſs unnoticed, in active and buſy life. The moſt celebrated writers of this ſpecies of novel, are Sterne and Goethè. Sterne poſſeſſes wit and humour, intermingled with no ſmall ſhare of diſguſting and profligate buffoonery; the ſentimental parts of his writings are of very different merit; wherever he is entirely filled with his ſubject, ſo that he forgets his affectation of feeling and ſentiment, he is moſt touchingly pathetic, and exhibits a proof of a literary maxim, which he too often neglected, that ſimple and natural incidents, if told in correſpondent language, have more command over the feelings and ſympathy of the reader, than ſcenes of extraordinary and accumulated diſtreſs, pourtrayed in figurative and ſtrained language. It may, however, juſtly be doubted, whether indolent and paſſive ſympathy, rather than active and diſcriminating benevolence, will not be generated by the peruſal, even of the fineſt paſſages in Sterne's novels.

Perhaps few novels were ever more popular than the Sorrows of Werter were, at one time; but their popularity has been long on the wane. It is a ſentimental novel of a very different claſs from the writings of Sterne; being diſtinguiſhed rather by ſtrong and boiſterous paſſion, than by delicate and ſhrinking ſenſibility; and while an indolent languor of feeling is produced by the latter author, the peruſal of the novel of Goethè is calculated to ſtimulate an ungovernable temper, impatience of reſtraint, and contempt for all the ſober and rational maxims of life. The ſenſibility pourtrayed and recommended by Sterne is juſtly cenſurable, as indulging too much in what may be termed the luxury of grief; as directed to, and expended upon improper and unworthy objects, and as totally incompatible with that enlightened and vigorous benevolence, which alone can exerciſe and improve the mind and heart, and confer a real bleſſing on mankind: but the ſelfiſhneſs which lurks in it, is by no means ſo groſs as the ſelfiſhneſs of the hero of the Sorrows of Werter. He is indeed feelingly alive to every incident and impreſſion, but only ſo far as they are connected either with his own happineſs, or with the happineſs of that being in whom he has centered his own. While, however, the Sorrows of Werter muſt be condemned on this account, they deſerve high praiſe for the diſplay of genius which they exhibit; genius indeed not regulated by ſober judgment, or a refined taſte, but partaking, in a high degree, of that impetuoſity and extravagance, which always diſtinguiſh it in a barbarous age.

From this view of ſome of the beſt authors in the higheſt claſs of novel writing, it will be abundantly evident, that the peruſal of theſe works is more calculated, and apt, to be prejudicial than advantageous, unleſs the mind is previouſly fortified with ſound principles, and the paſſions and feeling are completely under the maſtery of the judgment. Even then, their claim muſt reſt, rather on the intereſt which they excite, than on the inſtruction which they afford. Whoever draws his opinions of the world, of the manners, characters, and purſuits of mankind, from novels, will enter on real life to great diſadvantage; the perſonages of novels, eſpecially of thoſe which teem from the modern preſs, either bear no reſemblance to mankind, or that reſemblance conſiſts in ſuch a narrow peculiarity of feature, as renders it rather an individual than a general picture. But the ſtrongeſt and moſt undoubted objection to novels, ariſes from the effects which the peruſal of them produces on the mental faculties, and the literary taſte; during it the mind is nearly paſſive; a lounging, deſultory habit of reading is acquired, ſo that when works are to be peruſed which require cloſe and regular attention, and a judgment conſtantly on the alert, to follow and comprehend the author's obſervations and arguments, the mind is unequal to the taſk. The literary taſte will ſuffer equally, except the reading be confined to a very few ſelect novels: unleſs, therefore, the habits of cloſe, active, and vigorous attention are of a very powerful and predominating nature, and the taſte has been modelled to correctneſs and purity, by long and regular diſcipline, novels ought to be avoided: where theſe preparatives exiſt, their peruſal cannot do harm; it will intereſt, if it does not inſtruct; it will never be indulged in to an improper extent, and it will reſtore the mind to more ſober and uſeful ſtudies, with greater reliſh and renewed freſhneſs.

Novel *Aſſignment*, in an action of treſpaſs, is an aſſignment of time, place, or the like, in a declaration, otherwiſe or more particularly than it was in the writ.

Novel *Diſſeiſin*. See Assise *of novel diſſeiſin*.

NOVELDA, in *Geography*, a town of Spain, in the province of Valencia; 15 miles W. of Alicant.

NOVEMASTO, a town of Auſtrian Poland, in Galicia; 40 miles W.S.W. of Lemberg.

NOVEMBER, the eleventh month in the Julian year, but the ninth in the year of Romulus; whence its name.

NOVEMIASECZKO, in *Geography*, a town of Samogitia; 26 miles N.E. of Medniki.

NOVEMPOPULANIA, in *Ancient Geography*, a province of Gaul, towards the ſouth-weſt.

NOVEMSILES, or Novensiles, in *Mythology*, a ſpecies of gods worſhipped among the ancient Romans.

The dii novemſiles were the gods of the Sabines, adopted by Romulus; and had a temple built to them, in conſequence of a vow, by king Tatius.

Some antiquaries take the name to have been given to thoſe heroes who were laſt placed among the number of the gods; as Hercules, Veſta, Sanctity, Fortune, &c.

NOVEMVIRI, an order of magiſtrates at Athens, nine in number.

The novemviri were the chief magiſtrates of the city; their office only held for one year. Their chief was called *archon*, whoſe name was recorded in the Athenian feaſts; as, at Rome, that of the conſuls.

The ſecond bore the title of *baſileus;* the third, of *polemarcha, i. e.* chief of the troops; and the remaining ſix, of *theſmothetes*.

NOVENDIALE, or Novemdiale, in *Antiquity*, a ſolemn ſacrifice among the Romans, held on occaſion of any prodigies appearing to menace them with ill fortune.

It had its name from the term of its celebration: *viz. novem dies, nine days*.

NOUER L'Eguillette, in the *Manege*. See Yerking.

NOVES, in *Geography*, a town of Spain, in New Caſtile; 16 miles N.N.W. of Toledo.

NOUGARSEK, a town of Eaſt Greenland. N. lat. 61° 14′. W. long. 45° 30′.

NOVGOROD, or Novogorod, a city of Ruſſia, and capital of a government, on the river Volchova, at the N. end of the lake Ilmen; the ſee of an archbiſhop. This is one of the moſt ancient cities in Ruſſia, and was formerly called "Great" Novogorod, to diſtinguiſh it from other Ruſſian towns of a ſimilar name. According to Neſtor, the earlieſt of the Ruſſian hiſtorians, it was built at the ſame time with Kiof, in the middle of the fifth century, by a Sclavonian horde, that iſſued from the banks of the Volga. In the ninth century Ruric, the firſt great duke of Ruſſia, made this city the metropolis of his dominions; and though the

the ſeat of government was removed to Kiof in the year 879, the next year after his death, Novogorod continued for more than a century under the juriſdiction of governors, nominated by the great dukes. In 1036, Yaroſlaf, ſon of Vlodimir, who occupied the throne of Ruſſia, granted to the inhabitants conſiderable privileges, that laid the foundation of their liberty. The dukes of this city, who were at firſt ſubordinate to the great dukes, who reſided at Kiof and Volodimir, gradually uſurped, as the place advanced in wealth and population, an abſolute independency. They were, however, unable to maintain their authority over their own ſubjects; ſo that Novogorod was a republic under the juriſdiction of a nominal ſovereign. The privileges of this town proved very beneficial to its real intereſts; and it became the great mart of trade between Ruſſia and the Hanſeatic cities, and made rapid advances in opulence and population. Its territory extended as far as the frontiers of Livonia and Finland, and compriſed great part of the province of Archangel, and a large diſtrict beyond the north-weſtern limits of Siberia. So extenſive were its dominions, ſo great its powers, and ſo impregnable its ſituation, as to give riſe to a proverb, "who can reſiſt the gods, and Great Novogorod?" In the year 1471, Ivan Vaſſilievitch I. aſſerted his right to the ſovereignty of this principality, and having vanquiſhed the troops of the republic, forced the citizens to acknowledge his claims, and appointed a governor, who was permitted to reſide in the town, and exerciſe the authority formerly veſted in their own dukes. But at this time, they retained their own laws, choſe their own magiſtrates, and the governor never interfered in public affairs, except by appeal. Ivan, not ſatisfied with this limited government, proceeded to extend his authority, and in 1477 laid ſiege to the town. The ſubjugation of the citizens was ſo complete, that it was evinced by the removal of an enormous bell from Novogorod to Moſcow, denominated by the inhabitants "eternal," and revered as the palladium of their liberty, and the ſymbol of their privileges. Nevertheleſs, ſubject as it afterwards was to the deſpotiſm of Ivan, and his ſucceſſors, it ſtill continued to be the largeſt and moſt commercial city in all Ruſſia. It is deſcribed accordingly by Richard Chanceler, who paſſed through it in 1554, on his way to Moſcow. In its moſt flouriſhing condition, it contained at leaſt 400,000 ſouls. In 1570, a conſpiracy having been diſcovered againſt the government of Ivan Vaſſilievitch II., he repaired thither in perſon, and appointed a court of inquiry, juſtly denominated the "tribunal of blood." On each day, during the interval of five weeks, more than 500 inhabitants fell victims to the vengeance of incenſed deſpotiſm. According to ſome authors 25,000, and as others ſay, 30,000 perſons periſhed in this dreadful carnage. By this cataſtrophe, and ſubſequent oppreſſion, Novogorod was conſiderably impaired, both with regard to ſtrength and ſplendour; but it was not totally obſcured, until Peterſburgh was founded, and Peter the Great transferred thither all the commerce of the Baltic, which had before centered in this city. The preſent town is ſurrounded by a rampart of earth, with a range of old towers at regular diſtances, forming a circumference of about one mile and a half; within which incloſure are many uninhabited houſes, and much open ſpace. It ſtretches on both ſides of the Volkof, which is a beautiful river of conſiderable depth and rapidity, ſomewhat broader than the Thames at Windſor, and ſeparating the town into two diviſions, *viz.* the Trading part, and the Quarter of St. Sophia, which are united by a bridge, partly wood, and partly brick. The former diviſion comprehends, if we except the governor's houſe, a rude cluſter of wooden habitations, preſenting ruined remains of ancient grandeur. The latter diviſion derives its appellation from the cathedral of St. Sophia, completed in 1051, and includes the fortreſs or Kremlin, which contains the cathedral, with ſome other buildings, beſides a waſte ſpace, overſpread with weeds and nettles, and covered with ruins. The entrance into the cathedral has a pair of brazen gates, ornamented with various figures in alto relievo, repreſenting the paſſion of our Saviour, and other ſcriptural hiſtories. Withinſide are twelve maſſy piers, which, as well as the walls, are thickly covered with the repreſentation of our Saviour, the Virgin Mary, and of various ſaints. Some of theſe paintings are very ancient, and probably anterior to the revival of the art in Italy. Several princes of the ducal family of Ruſſia are interred in this cathedral. According to Heym, Novogorod, in 1783, contained 62 churches, 6 convents, and excluſively of 12 public buildings, 1512 houſes, of which only 39 were of brick. The population amounted to 3342 males, and 3784 females; 92 miles S.S.E. of Peterſburgh. N. lat. 58° 35'. E. long. 30° 44'. Coxe.

Novgorod, *Niznei*, a town of Ruſſia, and capital of a government, ſituated at the conflux of the Oka and Volga; built in the year 1222, and containing two cathedrals, twenty-eight pariſh churches, moſtly of ſtone, and five convents; an archbiſhopric, and having a caſtle ſurrounded with ſtone walls. The trade is conſiderable, and the ſhops, richly ſtored with home and foreign goods, make a handſome appearance; 492 miles E.S.E. of Peterſburg. N. lat. 56° 18'. E. long. 48° 54'.

Novgorod, *Sieverſkoe*, a government of Ruſſia, bounded on the N. by the governments of Smolenſk and Mogilev, on the N.W. by Mogilev, on the S.W. and S. by Tchernigovſkoi, and on the E. by the governments of Orlov, Kurſk, and Charkov; about 160 miles in length, and from 60 to 72 in breadth. N. lat. 50° 50' to 53° 25'. E. long. 31° 24' to 34° 34'.—Alſo, a town of Ruſſia, and capital of a government. N. lat. 52°. E. long. 33° 14'.

NOVGORODSKOI, a government of Ruſſia, ſo called from Novgorod, its capital, bounded N. by Olonetz, N.W. by the government of Peterſburg, on the S.W. by that of Pikov, S.E. by that of Tver, and E. by that of Vologda; its length being about 320 miles, and mean breadth about 160. N. lat. 57° 10' to 61° 10'. E. long. 29° 39'.

NOVI, a fortified town of Croatia, on the left bank of the Unna; 45 miles S.E. of Carlſtadt.—Alſo, a town of the Ligurian republic; 24 miles N. of Genoa. N. lat. 44° 47'. E. long. 8° 48'.

NOVIA Bunder, a town of Hindooſtan, in Guzerat; 45 miles N.W. of Puttan Sumnaut.

NOVICE, a perſon not yet ſkilled or experienced in an art or profeſſion.

In the ancient Roman militia, *novicii*, or *novitii*, were the young raw ſoldiers, diſtinguiſhed by this appellation from the veterans.

In the ancient orders of knighthood there were novices, or clerks in arms, who went through a kind of apprenticeſhip before they were admitted knights.

Novice is more particularly uſed in monaſteries, for a religious, yet in his, or her year of probation, and who has not made the vows.

In ſome convents the ſuperior has the direction of the novices. In nunneries the novices wear a white veil, the reſt a black one.

A novice is not eſteemed dead in law, but is capable of inheriting till the time of actual profeſſion; nor can his benefices be taken away during the year of probation, without his conſent.

The council of Trent prohibits a novice from aſſigning

over his benefices, till two months before the expiration of his year of probation; and he may even reſume them, if the profeſſion be null.

A novice is not allowed to make any donation to his ſuperior, by reaſon of the dependence he is under.—Novices may either quit the convent during their noviciate, or may be turned off by the convent.

NOVICIATE, a year of probation, appointed for the trial of religious, whether or no they have a vocation, and the neceſſary qualities for living up to the rule; the obſervation whereof they are to bind themſelves to by vow.

The noviciate laſts a year at leaſt; in ſome houſes more. It is eſteemed the bed of the civil death of a novice, who expires to the world by profeſſion.

NOVICIATE is alſo uſed for the houſes or places where novices are inſtructed.

In this ſenſe the noviciate is frequently a cloiſter ſeparate from the grand dormitory.

NOVIGRAD, in *Geography*, a town of Hungary, with a caſtle, which gives name to a county; 14 miles E. of Gran.—Alſo, a town of Sclavonia, 45 miles N. of Kralivvavelika.—Alſo, a town of Dalmatia, ſituated on a bay to which it gives name; 16 miles N. of Scardona. N. lat. 44° 28′. E. long. 17° 32′.

NOVIGUNGE, a town of Hindooſtan, in Dooab; 30 miles W. of Canoge.

NOVIODUNUM, in *Ancient Geography*, a town of Lower Mœſia, at the place where the Danube ſeparates into various branches. According to Ptolemy it is on the route from Nicomedia to Arrubium, between Dinigullia and Ægiſon, 20 miles from the former, and 28 from the latter. —Alſo, a town of Pannonia, upon the route from Æmona to Sirmium, between Prætorium Latovicorum and Quadratum, one mile from the firſt, and 28 miles from the ſecond.

NOVIOMAGUS, Lizieux, a town of Gaul, in the ſecond Lyonnenſis. It was the capital of the Lexovii, from whom it took its name.—Alſo, the ancient name of Spire, of Nimeguen, and of Noyon.

NOVION-PORCIEN, in *Geography*, a town of France, in the department of the Ardennes, and chief place of a canton, in the diſtrict of Rethel; ſix miles N. of Rethel. The place contains 1039, and the canton 11,243 inhabitants, on a territory of 222½ kiliometres, in 31 communes.

NOVIOREGUM, Royan, in *Ancient Geography*, a town of Gallia Aquitanica, between Tamnum and Mediolanum Santonum, 12 miles from the firſt, and 15 from the ſecond. Anton. Itin.

NOVISILLO, in *Geography*, a town of Hungary, on the Danube; four miles S.W. of Bacs.

NOVITA, or *Real el Novita*, a town of South America, capital of a diſtrict in the viceroyalty of New Grenada, annexed to the province of Choco; 160 miles N. of Popayan. N. lat. 5° 4′. W. long. 76° 16′.

NOVLENSKOI, a town of Ruſſia, in the government of Vologda, near the lake Kubenſkoe; 32 miles N.W. of Vologda.

NOUN, Nomen, in *Grammar*, a name or word which expreſſes the ſubject ſpoken of; or expreſſes a ſubject of which ſomething is, or may be affirmed; as man, food, whiteneſs, Henry, &c.

A noun, therefore, in language, anſwers to an idea in logic.

The generality of ſubjects ſpoken of have particular names; yet there are others, which, without being attached to the ſame particular ſubject, are yet real nouns.

Thus, beſides the particular name which each perſon bears, and by which others denote him, he gives himſelf another when he ſpeaks of himſelf, as *I*, or *myſelf*.

It is only the more particular names that in grammar have retained the quality of nouns; the more general ones are called *pronouns*.

Nouns, again, are to be viewed in another light, *viz.* as divided into nouns *ſubſtantive*, and nouns *adjective*.

They are called *ſubſtantives*, when the objects they deſign are conſidered ſimply in themſelves, and without any regard to their qualities.

They are called *adjectives*, when their objects are conſidered as clothed with any qualities.

But, in effect, the object is alone deſigned by the nouns ſubſtantives; which, in this view, are alone the proper nouns.

Adjectives, in reality, are only the modificatives of nouns; though in one view they may be conſidered as nouns; *viz.* as they do not ſo much repreſent a quality or circumſtance of the object, as the object itſelf, clothed with that quality or circumſtance. Nor muſt it be omitted, that a noun adjective frequently becomes a ſubſtantive: for as its nature is to expreſs the quality of an object, if that quality happen to be the object itſelf ſpoken of, then, according to our firſt definition, it becomes a ſubſtantive.

Thus, if I ſay, *a good intention*, the word *good* is here an adjective, repreſenting the intention as clothed with the quality of goodneſs; but if I ſay, *the good is to be choſen*, it is evident that *good* is here the ſubject ſpoken of, and of conſequence is a noun ſubſtantive. Nor are there caſes wanting, wherein nouns ſubſtantives become adjectives.

It is true, that in the common uſe of grammar, many nouns, that are really adjectives, are not reckoned as ſuch; none being eſteemed adjectives but thoſe which, without any, or at leaſt any conſiderable change in their inflexion and termination, are joined indifferently to nouns ſubſtantives of different genders.

Nouns are again divided into *proper* and *appellative*.

Nouns *proper* are thoſe which expreſs a particular thing or perſon, ſo as to diſtinguiſh it from all other things of the ſame kind; as Socrates.

Nouns *appellative* are thoſe common to ſeveral individuals of the ſame kind; as man, angel, &c.

Nouns *heterogeneous*, are ſuch as are of one gender in the ſingular number, and of another in the plural. See Heteroclyte.

NOVO Mirgorod, in *Geography*, a town of Ruſſia, in the government of Ekaterinoſlav; 136 miles W.N.W. of Ekaterinoſlav. N. lat. 48° 40′. E. long. 21° 44′.

NOVODVAR, a town of Hungary, four miles N. of Cſakathurn.

NOVOGRIGOREVSKOE, a town of Ruſſia, in the government of Ekaterinoſlav; 72 miles N.W. of Cherſon.

NOVOGRODEK, a town of Ruſſian Lithuania, in the palatinate of the ſame name, otherwiſe called "Black Ruſſia," ſituated on a hill, not large, but including ſeveral Ruſſian and Popiſh convents. Beſides a provincial elect, and inferior court of judicature, a high tribunal, like that of Wilna, is held alternately here and at Minſk, which continue ſitting for five months every year; 68 miles E. of Grodno. N. lat. 53° 33′. E. long. 26°.

NOVOI, a ſmall iſland in the Caſpian ſea; N. lat. 44° 50′. E. long. 51° 54′.

NOVOMIASTO, a town of Poland, in the palatinate of Rava; 20 miles S.E. of Rava.

NOVOMOSKOVSK, a town of Ruſſia, in the government of Ekaterinoſlav, on the Dnieper; 16 miles N. of Ekaterinoſlav. N. lat. 48° 30′. E. long. 35° 12′.

NOVOMST, a town of Ruſſia, in the government of Novgorod Sieverſkoe; 60 miles N.W. of Novgorod Sieverſkoe. N. lat. 52° 35′. E. long. 22°.

NOVORZEV, a town of Ruſſia, in the government of Pſkov, on the river Uda; 64 miles S.S.E. of Pſkov. N. lat. 57°. E. long. 29° 26′.

NOVOSEL, a town of European Turkey, in Romania, on the Mariza; 26 miles W. of Filipopoli.

NOVOSIL, a town of Ruſſia, in the government of Tula; 44 miles S.S.W. of Tula. N. lat. 53° 5′. E. long. 36° 54′.

NOVOSLOVO, a town of Ruſſia, in the government of Kolivan; 72 miles S.S.W. of Kraſnoiarſk.

NOVOTZURUCHETNEVSKOI, a town of Ruſſia, in the government of Irkutſk, on the Argun; 152 miles S.E. of Nertchinſk.

NOVOUSOLE, a town of Ruſſia, in the government of Perm, on the Kama; eight miles S. of Solikamſk.

NOUP Head, a cape on the W. coaſt of the iſland of Weſtra. N. lat. 59°. W. long. 2° 56′.

NOUPRA, a mountain of Thibet; 51 miles S.W. of Laſſa.

NOURDYA, a town of Perſia, in the province of Khoraſan; 108 miles S. of Meſchid.

NOUREDDIN, or Noradin, in *Biography*, ſultan of Syria, was the ſon of Zenghi, a lieutenant of the Seljukian ſultans, who had made himſelf the independent ſovereign of Aleppo and Moſul. Upon the death of his father in the year 1145, he took poſſeſſion of Aleppo, and fixed his reſidence there. Zenghi had obtained various ſucceſſes againſt the Chriſtian cruſaders ſettled at Jeruſalem and Antioch, and Noureddin continued the war with equal ſucceſs. He gained a complete victory over Bohemond, prince of Antioch, who loſt his life in the battle. He recovered ſeveral places of which the cruſaders had made themſelves maſters, and adding to his dominions the cities of Emeſſa and Damaſcus, he extended his rule from the Tigris to the borders of Egypt. In many of his expeditions he was attended by his nephew Salaheddin, ſo famous afterwards in the hiſtory of the cruſades under the name of Saladin, who, after his uncle's death, ſucceeded to the command, and in 1171 put an end to the dynaſty of the Fatimites. Noureddin may be accounted the moſt powerful and proſperous of the Mahometan princes of his time. He died in 1174, after a reign of twenty-nine years. He was illuſtrious, not only for his civil and military talents, but for all the virtues that can adorn a throne. No prince ſurpaſſed him in regard to juſtice, and to the rights of his ſubjects of all ranks, and to him is attributed the firſt inſtitution of a chamber of equity for the purpoſe of ſecuring the lower claſſes againſt the oppreſſions of the higher. The grateful feelings of his people towards him, on this account, were ſhewn after his death; thus a poor man, unable to obtain redreſs for an injury, went about the ſtreets of Damaſcus crying aloud, "O Noureddin, Noureddin, where art thou now?" His economy, with regard to his private expences, was worthy of the primitive ages, and was founded upon a ſenſe of the duty of a ſovereign to ſpare the property of his people. But in every thing relating to the public welfare, his liberality was boundleſs. He founded a number of colleges, hoſpitals and moſques, and rebuilt the walls and edifices of ſeveral of the principal cities of his dominions, which had ſuffered ſeverely from an earthquake. He was extremely religious according to the rules of his faith, yet is ſaid to have been entirely free from bigotry and intolerance. Univer. Hiſt.

NOURISHING Clysters. See Clyster.

NOURISHMENT. See Nutrition.

NOURRIR *les Sons*, to ſwell, cheriſh, and ſuſtain ſounds to the laſt moment of their value, inſtead of diſcontinuing them before their time is expired; as is often done. There are movements which require every note to be ſuſtained, and others that require the tones to be cut ſhort, detached, and only touched with the point of the bow.

NOUS Shehr, in *Geography*, a town of Aſiatic Turkey, in Caramania, anciently called "Nyſſa;" 40 miles S.E. of Kir-Shehr.

NOUSIS, a town of Sweden, in the government of Abo; 10 miles N.N.W. of Biorneborg.

NOUSKERY, a town of Hindooſtan, in Lahore; 55 miles S.S.W. of Lahore.

NOUTRA, a town of Poland, in the palatinate of Cracow, on the frontiers of Hungary, near which are ſome gold mines; 30 miles S. of Cracow.

NOUTROKOOAGAN, a river of Canada, which diſcharges itſelf into St. John's lake. N. lat. 48° 26′. W. long. 72° 38′.

NOUVION, a town of France, in the department of the Somme, and chief place of a canton, in the diſtrict of Abbeville. The place contains 623, and the canton 9856 inhabitants, on a territory of 202½ kiliometres, in 20 communes.—Alſo, a town of France, in the department of the Aiſne, and chief place of a canton, in the diſtrict of Vervins; 13 miles N.W. of Vervins. The place contains 3357, and the canton 10,106 inhabitants, on a territory of 115 kiliometres, in nine communes.

NOVUS *Auris Muſculus*, in *Anatomy*, a name given by Fabricius to the muſcle called by Albinus laxator tympani, and by others externus auris, and exterior.

Novus *Portus*, in *Ancient Geography*, a port on the ſouthern coaſt of the iſle of Albion, between the mouth of the river Triſanton and the promontory Cantrum, according to Ptolemy.

NOWA Grodla, in *Geography*, a town of Poland, in the palatinate of Braclaw; 36 miles N. of Braclaw.

NOWADA, a town of Bengal; 22 miles S. of Ghidore.—Alſo, a town of Bengal; ſix miles S. of Curruckdeagh.—Alſo, a town of Bengal; 18 miles S. of Burdwan.—Alſo, a town of Bengal; 17 miles N. of Toree.—Alſo, a town of Bengal, at which is a paſs acroſs mountains; 15 miles S.E. of Ramgur.—Alſo, a town of Hindooſtan, in Bahar; 20 miles S. of Bahar. N. lat. 24° 53′. E. long. 85° 43′.

NOWADAH, a town of Bengal; 54 miles N.E. of Ramgur.—Alſo, a town of Hindooſtan, in Bahar; 30 miles E. of Gayah.—Alſo, a town of Hindooſtan, in Dooab; 30 miles E. of Canoge.

NOWADEE, a town of Bengal; three miles S. of Koonda.—Alſo, a town of Bengal; 46 miles N.N.W. of Ramgur.

NOWADY, a town of Bengal; 16 miles W. of Doeſa. N. lat. 22° 58′. E. long. 84° 45′.

NOWAG, a town of Sileſia, in the principality of Neiſſe; eight miles N.W. of Neiſſe.

NOWAGEE, a town of Bengal; 20 miles N. of Palamow.

NOWAGONG, a town of Hindooſtan, in Oude; 22 miles N.W. of Kairabad.

NOWAGUNGE, a town of Hindooſtan, in Oude; 12 miles S.E. of Bahreitch.

NOWAGUR, a town of Bengal; 15 miles N.E. of Palamow.—Alſo, a town of Hindooſtan, in the circar of Ruttunpour; 36 miles E. of Ruttunpour.

NOWANAGUR, a town of Hindooſtan, in Bahar; 55 miles S.W. of Patna. N. lat. 25° 23′.

NOWAR, a town of Hindooſtan, in Bahar; 43 miles S.W. of Arrah.

NOWE, a town of Pruſſia, in the province of Pomerelia, on the Viſtula; 40 miles S. of Dantzic.—Alſo, a town of America, in the ſtate of Tenneſſee; 46 miles N. of Knoxville.

NOWECZEITLY, a town of Auſtrian Poland, in Galicia; 28 miles E. of Lemberg.

NOWECZELKO, a town of Poland, in Podolia; 64 miles N.W. of Kaminiecz.

NOWED, Nowe, *i. e. knotted*, in *Heraldry*, is applied to the tails of ſuch creatures as are very long, and ſometimes repreſented in coat-armour, as if tied up in a knot.

NOWELL, Alexander, in *Biography*, a learned divine of the church of England, was born at Read, in Lancaſhire, in the year 1511. When only thirteen years of age, his progreſs in learning was ſo great, that he was entered of Brazen-noſe college in the univerſity of Oxford, where he proſecuted his ſtudies with much ſucceſs, and was admitted to the degree of B. A. in 1536, and to that of M. A. in 1540. Before he took the laſt-mentioned degree, he was elected fellow of his college. Having acquired a high reputation for learning and piety, and diſtinguiſhed himſelf by his zeal in promoting the reformation, he opened a ſchool in the city of Weſtminſter, where he educated his pupils in Proteſtant principles. About the year 1550, king Edward VI. granted him a licence for preaching, and in the following year he was inſtalled prebendary of Weſtminſter. In the firſt parliament of queen Mary's reign, he was returned one of the burgeſſes for Weſtlow in Cornwall; but his election was declared void, it being determined that having, by his prebend, a voice in the houſe of convocation, he could not ſit in the houſe of commons. He fled to the continent to avoid the perſecution of the times, but upon the acceſſion of queen Elizabeth, he was one of the firſt Proteſtant exiles who returned to England, and ſoon obtained conſiderable preferment. For thirty years together he preached the firſt and laſt ſermons in Lent before the queen, "wherein," according to Anthony Wood, "he dealt plainly and faithfully with her majeſty, without diſlike," that is, he probably pleaded ſtrongly againſt errors and practices, in which ſhe did not feel herſelf involved, for when he attacked one of her favourite doctrines, ſhe called aloud to him from her cloſet window, commanding him to retire from that ungodly digreſſion, and to return to his text. In 1562 dean Nowell was choſen prolocutor of the lower houſe of convocation. In 1594 he was inſtalled canon of Windſor; and in the following year he was elected principal of Brazen-noſe college in Oxford. In the ſame year he was created doctor of divinity, with a right of precedence over all the doctors then in the univerſity, both on account of his great age, and his high dignity in the church. He died in 1602, having reached the advanced age of ninety, and retained to the laſt the perfect uſe of his faculties. He gave an eſtate of 200*l. per ann.* for the ſupport of ſcholarſhips in Brazen-noſe college. He was author of ſeveral works, but that which is moſt known is a catechiſm, publiſhed by the unanimous approbation of the convocation. He drew up alſo a ſmaller catechiſm in Greek and Latin, which was tranſlated into Engliſh and into the Hebrew language.

Nowell, Lawrence, brother of the preceding, was alſo a clergyman of the church of England, and educated partly at Brazen-noſe college, and partly at Cambridge. Like his brother he fled to Frankfort from the perſecutions of queen Mary, and returned after her death, and was promoted to the deanery of Litchfield and the archdeaconry of Derby. He alſo obtained prebends in the cathedral churches of York and Chicheſter. He died in 1576, at the age of ſixty. He was deeply learned in antiquities, and particularly in the Saxon language and literature, being, according to Camden, the firſt who revived the ſtudy of it in this kingdom. Under his inſtructions the famous Lambarde made himſelf maſter of that tongue, and he is ſaid to have availed himſelf of the aſſiſtance and notes of his tutor, when he wrote his work "De Priſcis Anglorum Legibus." Mr. Nowell left behind him "A Saxon Engliſh Dictionary," in MS. ſtill remaining in the Bodleian library at Oxford, of which Francis Junius had a copy when he compiled his "Etymologicum Anglicanum," and Somner made much uſe, when he wrote his "Saxon Dictionary." He made "Collections" from curious ancient hiſtorical manuſcripts, which are preſerved in the Cottonian library. Biog. Brit.

NOWELZACLO, in *Geography*, a town of Aland, in Galicia; 44 miles S.S.E. of Halicz.

NOWGONG, a town of Bengal; 21 miles E.S.E. of Nattore.

NOWIDWOR, a town of Lithuania, in the palatinate of Novogrodek; 68 miles S.W. from Novogrodek.

NOWLAYE', a town of Hindooſtan, in the circar of Kitchwara; 20 miles S.W. of Ougein.

NOWOGROD, a town of Poland, in the palatinate of Braclaw; 24 miles S. of Braclaw.

NOWOPOL, a town of Poland; 56 miles N.N.W. of Cracow.

NOWOSICKLI, a town of Poland, in the palatinate of Chelm; eight miles W. of Chelm.

NOWT, in *Agriculture*, a provincial word ſometimes applied to neat cattle.

Nowt-*Herd*, a provincial word ſignifying a cattle-herd, or keeper of cattle.

NOWYLARG, in *Geography*, a town of Poland, in the palatinate of Cracow; 40 miles S. of Cracow.

NOXON, Noxonton, or *Nox Town*, a town of America, in Newcaſtle county, in Delaware; 21 miles N. of Dover.

NOY, William, in *Biography*, an able and induſtrious lawyer, was born in or about the year 1577, at St. Buriens in Cornwall. At the age of ſixteen he was entered of Exeter college, Oxford, whence he removed to Lincoln's-Inn to ſtudy the law. In this profeſſion he roſe to conſiderable eminence, and was choſen repreſentative for Helſton in two parliaments towards the cloſe of king James' reign. At this period he exerted himſelf as a firm oppoſer of the arbitrary exertions of the royal prerogative. In 1625 he was elected a member of the houſe of commons for St. Ives, and in the parliament of that year under Charles I., and a ſucceeding one, he perſiſted in the ſame courſe of patriotic conduct. No man ſurpaſſed him in the diligence with which he ſought all precedents favourable to parliamentary privilege, and detected all the oblique methods employed by former kings in raiſing money. Such was his influence in the houſe, and his popularity through the country, that it was thought deſirable by the court to purchaſe him, and accordingly the place of attorney-general, conferred upon him in 1631, gave a complete turn to his mind, and brought him over to the royal party. From this moment he was among the moſt active ſervants of the crown in promoting every violent and arbitrary meaſure, and he executed his particular office with the moſt violent ferocity. He countenanced, defended, and juſtified the illegal exaction of ſhip-money: and his manners, ſo far from attempting to conciliate the people, over whom he held his ſway, aggravated the odiouſneſs of his public conduct, for he was haughty, rude, and cynical.

He at length became an object of public and universal hatred, and in that ſtate died in the year 1634, at the age of fifty-ſeven. His ardour in the cauſe of tyranny cauſed him to be regretted by thoſe labouring in the ſame wretched cauſe, and archbiſhop Laud thus ſpeaks of his death in his diary: "I have loſt a near friend of him, and the church the greateſt ſhe had of his condition, ſince ſhe needed any ſuch." He left behind him ſeveral works on legal ſubjects, as, "A Treatiſe of the principal Grounds and Maxims of the Laws of England:" "Perfect Conveyancer; or ſeveral ſelect and choice Precedents:" "Reports of Caſes in the Time of Queen Elizabeth, King James, and Charles I:" "Complete Lawyer, or A Treatiſe concerning Tenures or Eſtates in Lands of Inheritance for Life, and other Hereditaments and Chattels, real and perſonal:" "Arguments and Law Speeches." Noy alſo left in MS. "Collections from the Records in the Tower, in ſupport of the King's naval Prerogatives, and of the Privileges and Powers of eccleſiaſtical Courts."

NOYA, in *Geography*, a ſea-port town of Spain, in Galicia, at the mouth of the Tambro, in a bay of the Atlantic. The principal trade is the building of ſhips; 19 miles W.S.W. of Compoſtella. N. lat. 42° 50'. W. long. 8° 56'.—Alſo, a river of Spain, which runs into the Robregat, near Martorell.

NOYANT, a town of France, in the department of the Maine and Loire, and chief place of a canton, in the diſtrict of Baugé; nine miles E. of Baugé. The place contains 464, and the canton 8990 inhabitants, on a territory of 320 kiliometres, in 15 communes.

NOYEL, a river of Hindooſtan, which riſes in the mountains about ten miles W. of Coimbetore, and runs into the Cauvery; 10 miles N.W. of Carroor.

NOYER, a town of France, in the department of the Yonne, and chief place of a canton, in the diſtrict of Tonnerre; 11 miles S. of Tonnerre. The place contains 1896, and the canton 8469 inhabitants, on a territory of 317½ kiliometres, in 16 communes.

NOYERS, a town of France, in the department of the Lower Alps, and chief place of a canton, in the diſtrict of Siſteron; five miles W. of Siſteron. The place contains 931, and the canton 4289 inhabitants, on a territory of 262½ kiliometres, in eight communes.

NOYLAND Point, a cape of England, on the N. coaſt of the iſland of Thanet; one mile W. of Margate.

NOYON, a town of France, in the department of the Oiſe, and chief place of a canton, in the diſtrict of Compiègne, ſeated on the Oiſe; before the revolution the ſee of a biſhop, the capital of an election, and the reſidence of a governor, containing ten pariſh churches. This was the native place of the famous John Calvin. The place contains 6000, and the canton 13,168 inhabitants, on a territory of 117½ kiliometres, in 17 communes. N. lat. 49° 35'. E. long. 3° 5'.

NOZA, a ſmall iſland near the W. coaſt of Madagaſcar. S. lat. 13° 30'. E. long. 40° 9'.

NOZAI, a town of France, in the department of the Lower Loire, and chief place of a canton, in the diſtrict of Chateaubriant. The place contains 2030, and the canton 7850 inhabitants, on a territory of 325 kiliometres, in ſix communes.

NOZDRICE, a town of Poland, in Volhynia; 64 miles N.E. of Zytomiers.

NOZEROY, a town of France, in the department of the Jura, and chief place of a canton, in the diſtrict of Poligny; 12 miles S. E. of Salins. The place contains 785, and the canton 8221 inhabitants, on a territory of 205 kiliometres, in 36 communes.

NOZLI, a town of Aſiatic Turkey, in Natolia; 44 miles W. of Degnizlu.

NUAPEND, a town of Hindooſtan, in the Carnatic; eight miles N.W. of Nellore.

NUAW, a town of Hindooſtan, in Bahar; 24 miles W. of Arrah.

NUAYHAS, the *Ague-tree*, a name given by the Indians to a ſort of bamboo cane, the leaves of which falling into the water, are ſaid to impregnate it with ſuch virtue, that the bathing in it afterwards will cure the ague. They uſe alſo a decoction of the leaves to diſſolve coagulated blood, giving it internally, and, at the ſame time, rubbing the bruiſed part externally with it.

There ſeems ſomething of fiction in the account of many particulars of this tree, in the Hortus Malabaricus, but it ſeems certain that the length of the ſtalks, or trunk, muſt be very great; for in the gallery of Leyden, there is preſerved a cane of it of twenty-eight feet long, and another but little ſhorter in the Aſhmolæan Muſeum at Oxford, which is more than eight inches in diameter; yet both theſe appear to be only parts of the whole trunk, they being nearly as large at one end as at the other.

NUBAS, in *Geography*, a fort of the Tyroleſe, for defending the paſſage of the Alps; ſix miles E. of Fueſſen.

NUBECULA, *Little Cloud*, in *Medicine*, a term ſometimes uſed for a diſeaſe in the eye, where objects appear as through a cloud or miſt.

The nubecula ſeems to ariſe from certain groſs particles detained in the pores of the cornea, or ſwimming in the aqueous humour, and thus intercepting the rays of light.

Nubecula, or *Nubes*, is alſo uſed for what we otherwiſe call *albugo* and *pannus*.

Nubecula is alſo uſed for a matter in form of a cloud, ſuſpended in the middle of the urine. This they ſometimes alſo called *enæorema*. See Urine.

NUBEDAM, in *Geography*, a town of Grand Bucharia; eight miles E. of Saganien.

NUBELOSA Linea, a term uſed by the Latin writers on heraldry, to expreſs a ſort of clouded line in certain coats of arms. Our heralds call it *nebule*, and the French *nuance*. It is figured ſo as to repreſent clouds at the edge, and was given to the firſt of the families who bear it, as a token of their ſkill in aſtronomy and navigation.

NUBES, in *Natural Hiſtory*, a word uſed by the ancients to expreſs that whitiſh foulneſs which we frequently ſee in the bottom of the fineſt columns of cryſtal; we expreſs this by the ſame word, *cloud*.

The columnar emeralds are ſubject to the ſame ſort of foulneſs at the bottom; and this part was called the root of the emerald properly enough, as it was that end of the column where it grew to the ſtone; but the word root of emerald has been ſince applied to ſeveral very different ſubſtances of a green colour, and ſome degree of tranſparence.

NUBIA, in *Geography*, a town of Africa, in the country of Nubia, on the Nile, ſuppoſed to be the ancient Meroe; 360 miles N.E. of Sennaar. N. lat. 18° 10'. E. long. 34° 54'.

Nubia, a country of Africa, bounded on the N. by Egypt, on the E. by the Red ſea, on the S. by Abyſſinia, and on the W. by unknown countries of Africa. Nubia is compoſed of ſeveral kingdoms, among which Sennaar and Dongola appear to be the moſt powerful, or at leaſt they are beſt known. A conſiderable part of this

country along the coaſt, and of the territory that lies between Egypt and Dongola, is ſubject to the dominion of the Turks. Sandy deſerts abound in this country, intermixed with various diſtricts, eſpecially thoſe that are adjacent to the rivers, which are uncommonly fertile.

NUBIGENUM Æs, a term uſed by ſome hiſtorians to ſignify copper generated in the clouds, and falling from thence with rains, or in ſtorms. They talk alſo of iron, and of ſtones produced the ſame way, and call them *ferrum nubigenum*, and *lapides nubigeni*.

Many of the German hiſtorians mention the falling of iron in duſt, and in large pieces; and Avicenna tells us ſuch things of Italy. Phil. Tranſ N° 156. See *Præternatural* RAINS.

NUBILES ANNI. See ANNI.

NUBLADA, in *Geography*, an iſland in the North Pacific ocean, with three ſmall ones lying near it, S.W. of Cape Corientes, on the coaſt of Mexico. N. lat. 16° 40'. W. long. 122° 30'.

NUBLE, a river of Chili, which runs into the Plata, 20 miles from its mouth.

NUCAIL, a town of Africa; 70 miles S.W. of Fez.

NUCAMENTACEÆ, in *Botany*, the laſt ſection of the order of *Compoſitæ*, in the Natural Orders of Linnæus. The term is taken from one of the old appellations of a catkin, or *amentum;* but it is not eaſy to perceive the leading principle of this ſection, under which are ranged ſome true compound ſyngeneſious plants, with others whoſe flowers are monoecious, the males being amentaceous, with perfectly diſtinct anthers, the females only compound or aggregate. The genera ſtand thus in the *Gen. Pl. Stoebe, Tarchonanthus, Artemiſia, Seriphium, Eriocephalus, Filago, Micropus, Iva, Parthenium, Ambroſia, Xanthium, Strumpfia.* To theſe are added in his manuſcript *Hippia, Gnaphalium, Xeranthemum*, and *Clibadium*.

NUCAMENTUM, the ancient Latin name for the catkin, or pendulous ſtring of flowers, for the moſt part male, as in the oak, fir, &c., for which Linnæus uſes the term *Amentum*. See CATKIN.

NUCASSE, in *Geography*, a town of America, in the Tenneſſee ſtate; five miles S. of Knoxville.

NUCERIA, NOCERA, in *Ancient Geography*, a town of Italy, in Campania, towards the S.E. The firſt colony that was conducted thither was in the time of Auguſtus.

NUCHA, the hinder part of the nape of the neck; called alſo *cervix*.

NUCHAN, in *Geography*, a town of Ruſſia, near the ſea, which ſeparates the continent of Aſia from America. N. lat. 66°. E. long. 189° 14'.

NUCHI, NUGHI, or *Scheki*, the capital of a country near the Caſpian ſea, called Scheki, and ſituated in the elevated ridge of mountains on the Kur. Nuchi conſiſts of 300 houſes, and is defended by a ſtrong caſtle, formerly called Kara Hiſſar, at preſent Galläſin Göräſen, which reſiſted the victorious troops of Nadir Shah. The population of the city and of the village belonging to it amounts to about 2800 families. To the S. of Nuchi, on the bank of the Kur, lies a large and flouriſhing market-town, called *Akdaſch*.

NUCI, LA, a town of Naples, in the province of Bari; 12 miles S.W. of Monopoli.

NUCIFEROUS, an appellation given by botaniſts to trees which bear nuts.

NUCIFRAGA, in *Ornithology*, a name given by many to the *coccothrauſtes*, or groſs-beak, from its breaking nuts and the ſtones of fruits. See LOXIA *Coccothrauſtes*. See alſo CORVUS *Caryocatactes*.

NUCIPERSICA, in *Botany*. See AMYGDALUS.

NUCK, ANTHONY, in *Biography*, a diſtinguiſhed Dutch phyſician and anatomiſt, flouriſhed at the Hague, and ſubſequently at Leyden, in the latter part of the ſeventeenth century. He filled the office of profeſſor of anatomy and ſurgery in the univerſity of the latter place, and was alſo preſident of the College of Surgeons. He purſued his diſſections with great ardour, cultivating both human and comparative anatomy at every opportunity. He died about the year 1692. He contributed ſome improvements alſo to the practice of ſurgery. The following is a catalogue of his publications. "De Vaſis aquoſis Oculi," Leid. 1685. "De Ductu ſalivali novo, Salivâ, ductibus aquoſis et humore aqueo oculorum," ibid. 1686. Some ſubſequent editions of this work were entitled, "Sialographia, et ductuum aquoſorum Anatome nova." "Adenographia curioſa, et Uteri fœminei Anatome nova, cum Epiſtola ad Amicum de Inventis novis." ibid. 1692, &c. "Operationes et Experimenta Chirurgica," ibid. 1692, and frequently reprinted. The three laſt mentioned works were publiſhed together, in three ſmall volumes, at Lyons, in 1722. Eloy Dict. Hiſt. de la Med.

NUCKIANÆ GLANDULÆ, in *Anatomy*, a number of ſmall glands, ſituate in that part of the ſkull wherein the orbits of the eyes are, between the abducent muſcle of the eye, and the upper part of the os jugale. See GLAND.

They were thus denominated from their diſcoverer, Anthony Nuck, profeſſor of phyſic at Leyden.

The ſame author gave his name to a ſalival duct, *ductus Nuckianus*.

NUCLEUS, a Latin word, literally denoting the kernel of a nut, or ſtone fruit; or, more ſtrictly, the edible part contained within the ſkin of the kernel.

NUCLEUS is alſo uſed by *Botaniſts*, in a larger ſenſe, for any fruit or ſeed contained within a huſk or ſhell.

NUCLEUS is alſo uſed by Hevelius, and ſome other aſtronomers, for the body of a comet, which others call its head, in contradiſtinction to its tail, or beard. See COMET.

NUCLEUS is alſo applied by ſome to the central parts of the earth, and other planets, as ſuppoſing them to be looſe from the exterior part, which they conſider as a cortex or ſhell.

NUCLEUS, in *Architecture*, denotes the middle part of the flooring of the ancients, conſiſting of a ſtrong cement, over which they laid the pavement, bound with mortar.

NUDDEAH, in *Geography*, a town of Hindooſtan, in Bengal; 30 miles E.N.E. of Burdwan.—Alſo, a town of Hindooſtan, in Dooab; 24 miles S. of Canoge.

NUDDERE, a town of Hindooſtan, in the circar of Ellichpour; 24 miles S.W. of Akoat.

NUDDYA, a town of Bengal; 31 miles N.W. of Burdwan.

NUDE COMPACT, *Nudum Pactum*, a bare contract, engagement, or promiſe of a thing without any conſideration: *Ex quo*, ſay the lawyers, *non oritur actio*. See CONTRACT.

NUDE *Matter* denotes a bare allegation of a thing done.

NUDIPEDALIA, among the ancients, a feſtival in which all were obliged to walk bare-footed.

This was done on account of ſome public calamity, as the plague, famine, an intenſe drought, and the like.

It was likewiſe uſual for the Roman matrons, when any ſupplication and vows were to be made to the goddeſs Veſta, to walk in proceſſion to her temple bare-footed.

NUDITIES,

NUDITIES, in *Painting* and *Sculpture*, denote thoſe parts of a human figure not covered with any drapery; or thoſe parts where the carnations appear.

NUEL, or rather *Newel* of a ſtaircaſe. See NEWEL, and STAIR-*caſe*.

NUESTRA SENHORA, in *Geography*, a town of South America, in the province of Cordova; five miles E. of Cordova.

NUESTRA *Senhora de Ajuda*, a town of Brazil; 150 miles S.W. of Fernambuco.

NUESTRA *Senhora del Eſtero*, a town of Braſil, capital of a government, on the coaſt oppoſite to the iſland of St. Catharine. S. lat. 28° 10′.

NUESTRA *Senhora de Luz*, an iſland in the Pacific ocean, diſcovered by Quiros in 1506; the ſame with that called "Pic de l'Etoile" by Bougainville. S. lat. 14° 30′.

NUESTRA *Senhora de Pecos*, a town of New Mexico; 10 miles E. of Santa Fé.

NUESTRA *Senhora de Popa*, a town of South America, in the province of Carthagena; five miles N. of Carthagena.

NUESTRA *Senhora de la Fé*, a town of South Ameriea, in the province of Cuyos. S. lat. 21°. W. long. 56° 46′. —Alſo, a town of South America, in the province of Paraguay; 120 miles S.S.E. of Aſſumption.

NUESTRA *Senhora de Nieves*, a town of Braſil, on an iſland in the Amazon river, in which are an ancient miſſion and Spaniſh ſettlement. S. lat. 2° 30′. W. long. 49° 35′.

NUESTRA *Senhora los Santos*, a town of South America, in the province of Cordova; 42 miles E. of Cordova.

NUESTRA *Senhora de Socoro*, a town of New Mexico, on the Bravo; 115 miles S. of Santa Fé. See CHONOS.

NUESTRA *Senhora de Vittoria*, a town of Braſil, in the government of St. Salvador; eight miles N.W. of St. Jorge. See TABASCO.

NUESTRA *Senhora de Talavera*, a town of South America, in the province of Tucuman.

NUEZ, a town of Spain, in the province of Leon, on the borders of Portugal; 42 miles W. of Zamora.

NUFAR, in *Botany*. See NUPHAR.

NUGARAH, in *Geography*, a town of Hindooſtan, in Allahabad; 27 miles N.E. of Gazypour.

NUGENT, ROBERT, *Earl*, in *Biography*, an ingenious nobleman, was born of an ancient family in the county of Weſtmeath, in Ireland, in the year 1709. He was bred a Roman Catholic, which religious profeſſion he abjured, and became a member of the Britiſh parliament in 1741. He was much attached to the cauſe of the prince of Wales, with whom he was a great favourite, and was appointed comptroller of the houſhold of his royal highneſs. In 1754 he was made commiſſioner of the treaſury, and in the parliament that met in the ſame year, he was choſen repreſentative for the city of Briſtol, and continued to ſit for that place till 1774, when he was choſen for St. Mawes. In 1766 he was appointed one of the commiſſioners of trade and plantations, and at the ſame time created a peer by the title of baron Nugent and viſcount Clare. He was afterwards raiſed to the rank of earl, and died in 1788. His lordſhip is known in the literary world by "A Collection of Odes and Epiſtles," which is ſaid to poſſeſs great merit. He was author likewiſe of "An Ode to Mankind," publiſhed in 1741; "Verſes addreſſed to the Queen, with a New Year's Gift of Iriſh Manufacture;" "Verſes to the Memory of Lady Townſend," and other pieces.

NUGENT, THOMAS, an Iriſh writer, and doctor of laws, who died at London in the year 1772. He publiſhed "A Tour in Europe," in 4 vols.; "Tranſlations of the Port Royal Latin and Greek Grammars;" "A Pocket Dictionary of the French Language;" and "A Vocabulary of the Greek Primitives." Dr. Nugent, in the preface to the above named Latin grammar, ſays, that the author of that work, and of the other grammars, out of his great modeſty, choſe to conceal himſelf under the general name of the Society of Port Royal, but that his name was Claude Lancelot, who was born at Paris in 1613. Having finiſhed his introductory ſtudies he retired to Port Royal, and was employed in the education of youth. His various grammars were founded on his experience as a diligent inſtructor. He was afterwards ſelected by the princeſs of Conti to educate the young princes. Conſiderable preferment was within his reach and actually preſſed upon him, but he choſe to retire to the abbey of St. Cyran, and enter a monaſtic life. He died at the age of eighty, at the abbey of Quimperlè, in Brittany.

NUGGOORDER, in *Geography*, a town of Hindooſtan, in Lahore; 30 miles E.S.E. of Sultanpour.

NUGHZ. See NAGEZ.

NUGOAH, a town of Hindooſtan, in Bahar; 10 miles N.N.W. of Chuprah.

NUITS, a town of France, in the department of the Coté d'Or, and chief place of a canton, in the diſtrict of Beaune, celebrated for the excellent wines made in its vicinity; 12 miles S. of Dijon. The place contains 2541, and the canton 12,367 inhabitants, on a territory of 332½ kiliometres, in 28 communes.

NUIZIA, a river of Ruſſia, which runs into the Olckma. N. lat. 57° 15′. E. long. 119° 34′.

NUK, or NUKOE, an iſland of the Baltic, which occaſionally becomes a peninſula, being joined to the main land; but when the water is high, and the wind blows from the ſea, the flood ſo runs between, that it is entirely cut off from the land, though at times it is poſſible to walk dryſhod from one to the other. Nuk is about 14 verſts long and eight broad.—Alſo, a lake in the government of Olonetz, about 40 miles long and ſix broad. N. lat. 64° 20′ to 64° 40′. E. long. 31° to 32°.

NULDINGAH, a town of Bengal, capital of the circar of Mahmudſi; 65 miles N.E. of Calcutta. N. lat. 23° 27′. E. long. 89° 16′.

NULEZ, a ſmall town of Spain, in the province of Valencia; 25 miles N.N.E. of Valencia. It is of a ſquare form, ſurrounded with walls flanked with towers, and has four gates. The houſes in narrow but ſtraight ſtreets exhibit a mean appearance. Its population amounts to about 3400 inhabitants.

NULHATTY, a town of Hindooſtan, in Bengal; 25 miles W.N.W. of Moorſhedabad. N. lat. 24° 17′. E. long. 87° 38′.

NULLACONDA, a town of Hindooſtan, in Golconda; 40 miles S.E. of Hydrabad.

NULLITY, the quality of a thing null, that is void, and of no effect, by reaſon of ſomething contrary to law, cuſtom, or form.

There are two kinds of nullities to invalidate a contract, or other inſtrument, *viz. de facto* and *de jure*. The former where the thing commences null *ipſo facto*, as ſoon as the thing is proved: in the latter the act does not immediately become null, but a handle is given thereby to have it entirely annulled, or ſet aſide.

NULLUA, in *Geography*, a town of Bengal; 30 miles S. of Calcutta.

NULSHI, a town of Hindooſtan, in Bengal; 20 miles N.N.W. of Pucculoe.

NUMA, POMPILIUS, in *Biography*, ſecond king of Rome, a Sabine, the ſon of Pompilius Pompo, a perſon of

illuſtrious family. The Sabines at this time were diſtinguiſhed for the ſimplicity and ſtrictneſs of their manners; and Numa, whoſe mind was improved by the philoſophy which he had imbibed in his youth, became himſelf eminent for wiſdom and virtue. It has been thought by ſome writers, that he received inſtruction from Pythagoras the Samian philoſopher; but there is good evidence to prove that this ſage was poſterior to Numa by a century. Such was the reputation of Numa, that Tatius, the Sabine aſſociate of Romulus in his kingdom, beſtowed upon him his daughter. At the death of Romulus, the Romans fixed upon him as their king, and two ſenators were deputed to acquaint him of the fact. Numa at firſt refuſed their offer, but was at length prevailed upon, with much difficulty, to accept the crown. He was not, like Romulus, fond of the arts and practice of war, but applied himſelf to tame the ferocity of his ſubjects, to inculcate a reverence for the Deity, and to quell their diſſentions, by dividing all the citizens into different claſſes. He eſtabliſhed different orders of prieſts, and encouraged the report which was ſpread of his paying regular viſits to the nymph Egeria, making uſe of her name to give ſanction to the laws and inſtitutions which he had introduced. He impreſſed upon the Romans the idea that the ſafety of the empire depended on the preſervation of the ſacred ſhield, which, as was then generally believed, fell from heaven. He dedicated new temples, particularly that of Janus, which was to remain ſhut in time of peace, and to ſtand open in time of war. He made ſeveral laws for the reformation of manners; and promoted agriculture, by aſſigning portions of the conquered lands to thoſe who had no other occupation. He endeavoured to break the diſtinction which ſubſiſted, when he came to the crown, between the Romans and the Sabines, by diſtributing the citizens generally into companies, according to their ſeveral trades and occupations, thus uniting the individuals of the two nations by the ſubordinate ties of communities of intereſt and employment. Another reform he attempted, which appears not only wonderful, but almoſt beyond belief, had we not ample evidence as to the fact; this was the reformation of the calendar, the principle of which was the diviſion of the year into twelve lunar months, which he made to correſpond with the courſe of the ſun by intercalations. Numa likewiſe marked out the boundaries of the Roman territories, which Romulus had declined doing; and, therefore, ſeemed to renounce the idea of future aggrandiſement by the operation of warfare. His whole reign was wholly pacific; and had his ſucceſſors been like himſelf, Rome would have been ranked only among the petty ſtates of Italy; he may, however, be juſtly denominated one of the founders of the Roman greatneſs, from the ſtability which he conferred on the conſtitution by his civil and religious inſtitutes. He died, after a reign of forty-three years, having arrived at the age of eighty-three. Previouſly to his death, he ordered his body to be interred in a ſtone coffin, contrary to the cuſtom of the times, and his books of ceremonies, which conſiſted of twelve in Latin, and as many in Greek, to be buried by his ſide. Theſe, it was ſaid, were taken up about 400 years after; and, becauſe it was thought impious to communicate the myſteries they contained to the common people, they were burnt by order of the ſenate. He left behind him one daughter, called Pompilia, who married Numa Marcius, and became the mother of Ancus Marcius, the fourth king of Rome. See Ancus. Univer. Hiſt. Plutarch.

NUMAGA, in *Geography*, a river of Germany, which runs into the Rhine, 6 miles above Briſach.

NUMANTIA, in *Ancient Geography*, a town in the interior part of Hither Spain, at one of the ſources of the Durius. According to Strabo, it was the capital of Celtiberia. Strong both by nature and art, and by the number of its inhabitants, it was built upon a hill difficult of acceſs, and on three ſides ſurrounded by mountains; and its extent was ſuch, that within its circuit they had paſture for their cattle. Numantia is celebrated in Roman hiſtory for the long war which it ſuſtained againſt this republic, and for the ferocious bravery with which it defended itſelf at the cloſe of a ſiege of twenty years. It was deſtroyed at length by Scipio Africanus in the year of Rome 620.

NUMB-*Fiſh*, a cramp-fiſh, in *Ichthyology*. See Torpedo.

NUMBER is properly a collection or an aſſemblage of units, or of ſeveral things of the ſame ſort. Some authors, however, give a more comprehenſive definition of number, calling it that by which quantity of any kind is expreſſed, and hence include under the ſame general denomination *integers*, *fractions*, and *ſurds*.

Numbers are alſo divided into a variety of claſſes, according to the particular manner in which they are generated, or the forms under which they are included, or the properties which they poſſeſs. The principal of which diviſions may be enumerated as follows:

*An unit*, or *unity*, is the repreſentation of any thing conſidered individually, without regard to the parts of which it is compoſed.

*An integer*, or *integral number*, is an unit, or an aſſemblage of units.

*An even number* is that which can be divided into two equal integral parts.

*An odd number* is that which cannot be divided into two equal integral parts; being greater or leſs than ſome even number by unity.

*A compoſite number* is any number that is produced by the multiplication of two or more integral factors; or it is a number that may be divided into two or more equal integral parts, each greater than unity.

*A prime number* is that which cannot be produced by the multiplication of any integral factors; or it is that which cannot be divided into any number of equal integral parts greater than unity. See Prime *Number*.

*Commenſurable numbers* are ſuch as have each the ſame common diviſor; or that may be each exactly divided into the ſame number of equal integral parts.

*Incommenſurable numbers*, or *numbers prime to each other*, are ſuch as have not a common diviſor.

*Square numbers* are thoſe which ariſe from the product of two equal integral factors.

*Cube numbers* are thoſe which ariſe from the product of three equal integral factors.

*A power* is that which ariſes from the multiplication of any number of equal factors, and it is called the 2d, 3d, 4th, &c. power, according as it conſiſts of two, three, four, &c. factors. See Power.

*A perfect number* is that which is equal to the ſum of all its diviſors, or aliquot parts; thus $6 = 1 + 2 + 3$; or $6 = \frac{6}{2} + \frac{6}{3} + \frac{6}{6}$; therefore 6 is a Perfect *Number*; which ſee.

*Abundant number* is that which exceeds the ſum of all its diviſors, or aliquot parts.

*Deficient number* is that which is leſs than the ſum of all its diviſors, or aliquot parts.

*Amicable numbers* are thoſe pairs of integers, each of which is equal to all the aliquot parts of the other: thus 284 and 220 are a pair of amicable numbers, for

$$\frac{284}{2} + \frac{284}{4} + \frac{284}{71} + \frac{284}{142} + \frac{284}{284} = 220;$$

and $$\frac{220}{2} + \frac{220}{5} + \frac{220}{10} + \frac{220}{11} + \frac{220}{22} + \frac{220}{20} + \frac{220}{44} + \frac{220}{55} + \frac{220}{110} + \frac{220}{220} = 284.$$

*Figurate numbers* are all thoſe that fall under the general expreſſion

$$\frac{n\,(n+1)\,(n+2)\,(n+3),\ \&c.\ \ldots\ (n+m)}{1\cdot 2\cdot 3\cdot 4,\ \ \&c.\ \ldots\ (m+1)}$$

and they are ſaid to be of the 1ſt, 2d, 3d, &c. order, according as $m = 1, 2, 3$, &c.: thus,

| | General term. |
|---|---|
| Nat. ſeries, 1, 2, 3, 4, 5, &c. - | $n$ |
| 1ſt ord. 1, 3, 6, 10, 15, &c. - | $\frac{n\,(n+1)}{1\cdot 2}$ |
| 2d ord. 1, 4, 10, 20, 35, &c. - | $\frac{n\,(n+1)\,(n+2)}{1\cdot 2\cdot 3}$ |
| 3d ord. 1, 5, 15, 35, 70, &c. | $\frac{n\,(n+1)\,(n+2)\,(n+3)}{1\cdot 2\cdot 3\cdot 4}$ |

4th ord. 1, 6, 21, 56, &c. &c.

Theſe are otherwiſe called *pyramidal numbers*.

*Polygonal numbers* are the ſums of different and independent arithmetical ſeries, and are termed *natural* or *lineal*, *triangular*, *quadrangular* or *ſquare*, *pentagonal*, *hexagonal*, *&c. numbers*, according to the ſeries from which they are generated.

*Lineal*, or *natural numbers*, are formed from the ſucceſſive ſums of a ſeries of units; thus,

Units, - 1, 1, 1, 1, 1, 1, &c.
Nat. numbers, 1, 2, 3, 4, 5, 6, &c.

General form, $n$.

*Triangular numbers* are the ſucceſſive ſums of an arithmetical ſeries, beginning with unity, the common difference of which is 1; thus,

Arith. ſeries, - 1, 2, 3, 4, 5, &c.
Triangular numbers, 1, 3, 6, 10, 15, &c.

General form, $\frac{n^2 - n}{2}$.

*Quadrangular* or *ſquare numbers* are the ſucceſſive ſums of an arithmetical ſeries, beginning with unity, the common difference of which is 2; thus:

Arithmetical ſeries, - 1, 3, 5, 7, 9, &c.
Quadrangular or ſquare numbers, 1, 4, 9, 16, 25, &c.

General form, $\frac{2n^2 - 0n}{2} = n^2$.

*Pentagonal numbers* are the ſucceſſive ſums of an arithmetical ſeries, beginning with unity, the common difference of which is 3; thus:

Arithmetical ſeries, 1, 4, 7, 10, 13, &c.
Pentagonal numbers, 1, 5, 12, 22, 35, &c.

General form, $\frac{3n^2 - n}{2}$;

and ſo on for *hexagonal*, *heptagonal*, *&c. numbers*; the general form for the *m-gonal* ſeries of numbers being

$$\frac{(m-2)\,n^2 - (m-4)\,n}{2}.$$

Theſe are called polygonal numbers, becauſe they may be always arranged in the forms of the ſeveral geometrical figures, after which they are denominated. See POLYGONAL *Numbers*.

NUMBERS are farther divided into *abſolute*, *abſtract*, *concrete*, *diſcrete*, *heterogeneal*, *homogeneal*, *rational*, *irrational*, *ſurd*, &c.; for which, ſee the reſpective adjectives.

*Theory of* NUMBERS is a modern and very intereſting branch of analyſis, which is directed towards the inveſtigation of the ſeveral properties, forms, diviſors, products, &c. of integral numbers. This ſubject was indeed conſidered by ſome of the ancient mathematicians, *viz.* by Ariſtotle and Pythagoras, and particularly by Euclid and Diophantus; but in conſequence of the embarraſſing notation of thoſe early times, and the total want of the algebraical analyſis, but little progreſs was made in this branch of ſcience till about the beginning of the 17th century, when Bachet, a French analyſt of conſiderable reputation, undertook the tranſlation of Diophantus into Latin, retaining alſo the Greek text, which was publiſhed by him in 1621, interſperſed with many marginal notes of his own, and which may be conſidered as containing the firſt germ of our preſent theory. Theſe were afterwards conſiderably extended by the celebrated Fermat, in his edition of the ſame work, publiſhed after his death in 1670, where we find many of the moſt elegant theorems in this branch of analyſis; but they are generally left without demonſtration, an omiſſion which the author accounted for, by ſtating that he was himſelf preparing a treatiſe on the theory of numbers, which would contain "multa varia et abſtruſiſſima numerorum myſteria:" but unfortunately this work never appeared, and moſt of his theorems remained without demonſtration for a conſiderable time.

At length the ſubject was again revived by Euler, Waring, and La Grange, three of the moſt eminent analyſts of modern times. The former, beſides what is contained in his "Elements of Algebra," and his "Analyſis Infinitorum," has ſeveral papers in the Peterſburgh Acts, in which are given the demonſtrations of many of Fermat's theorems. What has been done by Waring on this ſubject is contained in chap. v. of his "Meditationes Algebraicæ." And La Grange, who has greatly extended the theory of numbers, has ſeveral intereſting papers on this head in the Memoirs of Berlin, beſides what is contained in his Additions to Euler's Algebra. It is, however, but lately that this branch of analyſis has been reduced into a regular ſyſtem; a taſk that was firſt performed by Le Gendre, in his "Eſſai ſur la Théorie des Nombres," Paris, 1800; a ſecond edition of which was publiſhed in 1807: and nearly at the ſame time that the firſt edition appeared, Gauſs publiſhed his "Diſquiſitiones Arithmeticæ." Theſe two works eminently diſplay the talents of their reſpective authors, and contain a complete developement of this intereſting theory. The latter, in particular, has opened a new field of inquiry, by the application of the properties of numbers to the ſolution of binomial equations of the form, $x^n - 1 = 0$; on the ſolution of which depends the diviſion of the circle into $n$ equal parts, as was before known from the Coteſian theorem. (See POLYGON.) Mr. Barlow, of the Royal Military Academy, has alſo publiſhed a conciſe treatiſe on this ſubject, entitled "An elementary Inveſtigation of the Theory of Numbers;" to which work we are indebted for many of the preceding remarks and definitions, as alſo for ſeveral of the following properties of numbers, in which we have generally omitted the demonſtrations, as theſe would have carried us beyond the limits preſcribed to the preſent article.

*Properties*

*Properties of Numbers.*

PROP. I.

*On the Diviſors of Numbers.*—Every number N, when reduced to the form $N = a^m b^n c^p d^q$, &c. $a$, $b$, $c$, &c. being prime numbers, will have the number of the diviſors expreſſed by the formula

$$(m+1)(n+1)(p+1)(q+1), \text{ \&c.};$$

the number itſelf being conſidered as one of its diviſors.

Suppoſe, for example, it were required to find how many diviſors belong to the number 360.

Here we have $360 = 2^3 \cdot 3^2 \cdot 5$; therefore $m=3$, $n=2$, $p=1$. Hence, $(3+1)(2+1)(1+1) = 4 \cdot 3 \cdot 2 = 24$, the number of its diviſors.

Again: required how many diviſors belong to the number 1000.

Firſt, $1000 = 2^3 \cdot 5^3$; therefore $m=3$, and $n=3$; whence $(3+1)(3+1) = 4 \cdot 4 = 16$, the number of diviſors required, which are as follow: 1, 2, 4, 5, 8, 10, 20, 25, 40, 50, 100, 125, 200, 250, 500, 1000.

PROP. II.

To find a number that ſhall have any required number of diviſors.

Let $w$ repreſent the given number of diviſors: reſolve $w$ into its factors, as $w = x \times y \times z$, &c. Then take $m = x - 1$, $n = y - 1$, $p = z - 1$, &c.; ſo ſhall $a^m b^n c^p$ &c. be the number required, where $a$, $b$, $c$, &c. may be taken any prime numbers at pleaſure.

*Exam.*—Find a number that ſhall have 30 diviſors.

Firſt, $30 = 2 \times 3 \times 5$; that is, $x=2$, $y=3$, $z=5$: therefore, $m=1$, $n=2$, $p=4$; whence $a \cdot b^2 \cdot c^4$ is a number having 30 diviſors, as required.

If $a=2$, $b=3$, $c=5$; then $2 \cdot 3^2 \cdot 5^4 = 11250$.
If $a=3$, $b=3$, $c=2$; then $5 \cdot 3^2 \cdot 2^4 = 720$.
If $a=5$, $b=2$, $c=3$; then $5 \cdot 2^2 \cdot 3^4 = 1620$.

Each of which numbers has 30 diviſors; and it is evident that various other numbers might be obtained, that would have the ſame property, by only changing the values of $a$, $b$, $c$, &c.

When it is required to find the leaſt number that has a given number of diviſors, we muſt reſolve the given number into the greateſt number of factors, and proceed in given values to $a$, $b$, $c$, &c. as follows, *viz.* to the greateſt exponent the leaſt root, the next greater exponent the next leſs root, &c.; the roots themſelves being the leaſt prime numbers that can be employed for this purpoſe, and which will of courſe depend upon the number of factors.

Suppoſe, for example, it were required to find the leaſt number having 20 diviſors.

Here the greateſt number of factors is when we make $20 = 2 \times 2 \times 5$; or when $x=2$, $y=2$, and $z=5$, and therefore $m=1$, $n=1$, and $p=4$; ſo that $a^1 b^1 c^4$ is the leaſt form; and by making $c=2$, $b=3$, $a=5$, we have $2^4 \cdot 3^1 \cdot 5^1 = 240$, which is the leaſt number that has 20 diviſors.

PROP. III.

To find the ſum of all the diviſors of any given number.

Reſolve the given number into the form $a^m \cdot b^n \cdot c^p$ &c. then the ſum of all its diviſors will be expreſſed by the formula

$$\frac{a^{m+1}-1}{a-1} \times \frac{b^{n+1}-1}{b-1} \times \frac{c^{p+1}-1}{c-1}, \text{ \&c.}$$

Suppoſe, for example, it were required to find the ſum of all the diviſors of 360, the number itſelf being included as one of them.

Here $360 = 2^3 \cdot 3^2 \cdot 5$; therefore $a=2$, $b=3$, $c=5$; $m=3$, $n=3$, $p=1$; whence,

$$\frac{2^4-1}{2-1} \times \frac{3^4-1}{3-1} \times \frac{5^2-1}{5-1} = 15 \cdot 13 \cdot 6 = 1170;$$

which is the ſum of all the diviſors of 360, the number itſelf being conſidered as one of them.

PROP. IV.

To find how many integers there are leſs than a given number N, and alſo prime to it.

Reſolve the given number into the form $N = a^m b^n c^p$ &c. then will

$$N \times \frac{a-1}{a} \times \frac{b-1}{b} \times \frac{c-1}{c}, \text{ \&c.}$$

expreſs the number of integers that are leſs than $n$, and alſo prime to N.

*Exam.*—How many numbers are there leſs than 100, which are alſo prime to it?

Firſt, $100 = 2^2 \cdot 5^2$; therefore,

$$100 \times \frac{2-1}{2} \times \frac{5-1}{5} = 40,$$

the number ſought, theſe being as follow, *viz.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 13 | 27 | 39 | 51 | 63 | 77 | 89 |
| 3 | 17 | 29 | 41 | 53 | 67 | 79 | 91 |
| 7 | 19 | 31 | 43 | 57 | 69 | 81 | 93 |
| 9 | 21 | 33 | 47 | 59 | 71 | 83 | 97 |
| 11 | 23 | 37 | 49 | 61 | 73 | 87 | 99 |

*Exam.* 2.—How many numbers are there leſs than 360, that are alſo prime to it?

Here $360 = 2^3 \cdot 3^2 \cdot 5$; therefore,

$$360 \times \frac{2-1}{2} \times \frac{3-1}{3} \times \frac{5-1}{5} = 96,$$

the number ſought.

PROP. V.

A number that is the ſum of two ſquares prime to each other, can only be divided by numbers that are alſo the ſums of two ſquares; or, which is the ſame, every diviſor of a number falling under the form $t^2 + u^2$, $t$ and $u$ being prime to each other, is itſelf alſo of the ſame form.

Thus, for example, $65 = 8^2 + 1^2$, can only be divided by 13 and 5, each of which is the ſum of two ſquares; for $13 = 3^2 + 2^2$, and $5 = 2^2 + 1^2$.

Alſo, $50 = 7^2 + 1^2$ have for diviſors,

$$2 = 1^2 + 1^2,\ 5 = 2^2 + 1^2$$
$$10 = 3^2 + 1^2,\ 25 = 4^2 + 3^2.$$

And the ſame for all other numbers falling under the above form, obſerving only that the two ſquares muſt be prime to each other.

PROP. VI.

A number that is the ſum of a ſquare and double a ſquare, prime to each other, can only be divided by numbers that are alſo made up of the ſum of a ſquare and double a ſquare. Or, which is the ſame, every diviſor of a number falling under the form $t^2 + 2u^2$, $t$ and $u$ being prime to each other, is itſelf alſo of the ſame form.

Thus

Thus for example, $99 = 1^2 + 2 \cdot 7^2$, can only be divided by the following numbers, which are all of the ſame form; *viz.*

$$3 = 1^2 + 2 \cdot 1^2$$
$$9 = 1^2 + 2 \cdot 2^2$$
$$11 = 3^2 + 2 \cdot 1^2$$
$$33 = 5^2 + 2 \cdot 2^2$$

and the ſame for all other numbers of the above form.

PROP. VII.

Every number which is equal to the difference of a ſquare and double a ſquare, prime to each other, can have for diviſors only thoſe numbers which are alſo equal to the difference of a ſquare and double a ſquare. Or, every diviſor of numbers falling under the form $t^2 - 2u$, $t$ and $u$ being prime to each other, can only have for diviſors numbers that are of the ſame form. Thus for example, $98 = 10^2 - 2 \cdot 1^2$, have the four following diviſors, each of which is of the ſame form, *viz.*

$$2 = 2^2 - 2 \cdot 1^2$$
$$7 = 3^2 - 2 \cdot 1^2$$
$$14 = 4^2 - 2 \cdot 1^2$$
$$49 = 9^2 - 2 \cdot 4^2$$

and the ſame for all other numbers of this form.

For the diviſors of the powers of numbers, ſee POWERS.

*Of the Product and Transformation of certain numerical Formulæ.*

PROP. VIII.

The product of the ſum, and difference of two integers, is equal to the difference of their ſquares. For

$$(x + y)(x - y) = x^2 - y^2.$$

PROP. IX.

The product of the ſum of two ſquares by double a ſquare, is alſo the ſum of two ſquares. For

$$(x^2 + y^2) \times 2z^2 = (x + y)^2 \times z^2 + (x - y)^2 z^2.$$

Hence, if a number be the ſum of two ſquares, its double is alſo the ſum of two ſquares. Alſo, if a number N be the ſum of two ſquares, then $2^n$ N will be alſo the ſum of two ſquares.

Thus for example:

$5 = 2^2 + 1^2$; $5 \times 2 = 10 = 3^2 + 1^2$;
$10 \times 2 = 4^2 + 2^2$; $20 \times 2 = 40 = 6^2 + 2^2$; &c.

PROP. X.

The product ariſing from the ſum of two ſquares by the ſum of two ſquares, is alſo the ſum of two ſquares. For

$$(x^2 + y^2)(x'^2 + y'^2) = \begin{cases} (x x' + y y')^2 + (x y' - x' y)^2, \text{ or} \\ (x x' - y y')^2 + (x y' + x' y)^2 \end{cases}$$

Hence alſo it appears, that the product may be divided into two ſquares two different ways. And if this product be again multiplied by another, which is the ſum of two ſquares, the reſulting product may be divided into two ſquares four different ways; and generally, if a number N be the product of $n$ factors, each of which is the ſum of two ſquares; then will N be the ſum of two ſquares, and may be reſolved into two ſquares $2^n$ different ways.

For example:
$5 = 2^2 + 1$
$13 = 3^2 + 2^2$

The product $65 = 8^2 + 1^2$, or $7^2 + 4^2$

Again:
$17 = 4^2 + 1$

The product $\begin{cases} 1105 = 32^2 + 9^2 = 33^2 + 4^2 \\ = 31^2 + 12^2 = 24^2 + 23^2 \end{cases}$

And this reſolution of the propoſed product into ſquare parts, is readily effected by the foregoing formulæ. For,

$$(8^2 + 1)(4^2 + 1) = \begin{cases} (4 \cdot 8 + 1)^2 + (8 \cdot 1 - 4 \cdot 1)^2 \\ (4 \cdot 8 - 1)^2 + (8 \cdot 1 + 4 \cdot 1)^2 \end{cases}$$

$$(7^2 + 4^2)(4^2 + 1) = \begin{cases} (4 \cdot 7 + 1 \cdot 4)^2 + (4 \cdot 4 - 7 \cdot 1)^2 \\ (4 \cdot 7 - 1 \cdot 4)^2 + (4 \cdot 4 + 7 \cdot 1)^2 \end{cases}$$

and in the ſame manner may any other product ariſing from factors of this form be reſolved into its ſquare parts.

PROP. XI.

The product of the ſum of three ſquares by the ſum of two ſquares, is the ſum of four ſquares. For

$$(x^2 + y^2 + z^2)(x'^2 + y'^2) =$$
$$(x x' + y y')^2 + (x y' - y x')^2 + x'^2 z^2 + y'^2 z^2$$

which is evidently the ſum of four ſquares.

For example:
$14 = 3^2 + 2^2 + 1^2$
$5 = 2^2 + 1^2$

The product $\begin{cases} 70 = (3 \cdot 2 + 2 \cdot 1)^2 + (2 \cdot 2 - 3 \cdot 1)^2 \\ + 2^2 + 1^2 = 8^2 + 1^2 + 2^2 + 1^2 \end{cases}$

PROP. XII.

The product of the ſum of four ſquares by the ſum of two ſquares, is alſo the ſum of four ſquares. For

$$(w^2 + x^2 + y^2 + z^2)(x'^2 + y'^2) =$$
$$(w^2 + x^2)(x'^2 + y'^2) + (y^2 + z^2)(x'^2 + y'^2)$$

each of which products is the ſum of two ſquares, by the 10th propoſition above, and, conſequently, the whole product is the ſum of four ſquares.

PROP. XIII.

The product of the ſum of four ſquares by the ſum of four ſquares, is alſo the ſum of four ſquares. For

$$(w^2 + x^2 + y^2 + z^2)(w'^2 + x'^2 + y'^2 + z^2)$$
$$= \begin{cases} (w w' + x x' + y y' + z z')^2 + (w x' - x w' + y z' \\ - y' z)^2 + (w y' - x z' - y w' + z x')^2 + (w z' \\ + x y' - y x' - z w')^2 \end{cases}$$

as will appear immediately from the developement of the above formulæ; and, conſequently, the product in queſtion is the ſum of four ſquares.

As in this product there are only complete ſquares enter, we may change at pleaſure the ſigns of the ſimple quantities; and, conſequently, there will reſult ſeveral different formulæ equal to the ſame product, and each equal to the ſum of four ſquares; and in ſo many ways may numbers ariſing from factors of the above form be reſolved into the ſum of four ſquares. La Grange has rendered this propoſition more general by the following enunciation.

The product of the two formulæ

$$(w^2 - b x^2 - c y^2 + b c z^2)(w'^2 - b x'^2 - c y'^2 + b c z'^2)$$

$$= \begin{cases} (w w' + b x x', \pm c y y' \pm b c z z')^2 - \\ b(w x' + w' x \pm c y z' \pm c y' z)^2 - \\ c(w y' - b x z' \pm y w' \mp b z x')^2 + \\ b c (x y' - w z' \pm z w' \mp y x')^2 \end{cases}$$

which equality will appear from the developement of the formulæ.

PROP.

### Prop. XIV.

The product of the two formulæ $(x^2 \pm ay^2)$, and $(x'^2 \pm ay'^2)$, is of the same form as each of them. For,

$$(x^2 \pm ay^2)(x'^2 \pm ay'^2) = \begin{cases} (xx' + ayy')^2 \pm a(xy' + yx')^2, \text{ or,} \\ (xx' - ayy')^2 \pm a(xy' - yx')^2 \end{cases}$$

and, consequently, the product of any number of factors of the form $(x^2 \pm ay^2)$ will be itself also of the same form.

### Prop. XV.

The two formulæ $(x^2 + y^2 + z^2)$, and $(x^2 + y^2 + 2z^2)$, are so related to each other, that the double of either produces the other. For

$$2(x^2 + y^2 + z^2) = 2x^2 + 2y^2 + 2z^2 = (x + y)^2 + (x - y)^2 + 2z^2$$

which is evidently of the latter form. And,

$$2(x^2 + y^2 + 2z^2) = 2x^2 + 2y^2 + 4z^2 = (x + y)^2 + (x - y)^2 + 4z^2$$

which is also obviously of the same form as the first.

For example: $14 = 3^2 + 2^2 + 1^2$ (2)

The product $\begin{cases} = 28 = (3 + 2) + (3 - 2)^2 + 2 \cdot 1^2 \\ = 5^2 + 1^2 + 2 \cdot 1^2 \end{cases}$

Again: $15 = 3^2 + 2^2 + 2 \cdot 1^2$ (2)

The product $\begin{cases} = 30 = (3 + 2)^2 + (3 - 2)^2 + 2^2 \\ = 5^2 + 1^2 + 2^2 \end{cases}$

That is, each of these forms, when doubled, produces the other.

### Prop. XVI.

The formula $x^2 - 2y'^2$ may be always transformed to another of the form $2x'^2 - y'^2$, and this last may be again converted into the former.

This is obvious, because

$x^2 - 2y^2 = 2(x \pm y)^2 - (x \pm 2y)^2$, and
$2x^2 - y^2 = (x \pm 2y)^2 - 2(x \pm y)^2$

as will appear from the developement of the formulæ; and, consequently, any number that is of one of these forms is also of the other.

For example: $14 = 2 \cdot 3^2 - 2^2 = 4^2 - 2 \cdot 1^2$
Also, $28 = 6^2 - 2 \cdot 2^2 = 2 \cdot 4^2 - 2^2$

The same transformation has place with regard to numbers of the form $x^2 - 5y^2$; for

$x^2 - 5y^2 = 5(x \pm 2y)^2 - (2x \pm 5y)^2$, and
$5x^2 - y^2 = (5x \pm 2y)^2 - 5(2x \pm y)^2$

Thus, in the following numbers

$29 = 7^2 - 5 \cdot 2^2 = 5 \cdot 11^2 - 24^2 = 5 \cdot 3^2 - 4^2$
$41 = 5 \cdot 3^2 - 2^2 = 19^2 - 5 \cdot 8^2 = 11^2 - 5 \cdot 4^2$

which transformation is frequently extremely useful in the solution of Diophantine problems.

### Prop. XVII.

If $a$ be any number of the form $b^2 + 1$, then will the formula $x^2 - ay^2$ be resolvable into another of the form $ax^2 - y^2$; and, conversely, this last may be transformed into the former. For,

$$x^2 - (b^2 + 1)y^2 = (b^2 + 1)(x \pm by)^2 - (bx \pm (b^2 + 1)y)^2$$

And

$$(b^2 + 1)x^2 - y^2 = ((b^2 + 1)x \pm by)^2 - (b^2 + 1)(bx + y)^2$$

These general formulæ furnish us with the following particular ones:

$$\begin{cases} x^2 - 2y^2 = 2x'^2 - y'^2 \\ 2x^2 - y^2 = x'^2 - 2y^2 \end{cases}$$

$$\begin{cases} x^2 - 5y^2 = 5x'^2 - y'^2 \\ 5x^2 - y^2 = x'^2 - 5y'^2 \end{cases}$$

$$\begin{cases} x^2 - 10y^2 = 10x'^2 - y^2 \\ 10x^2 - y^2 = x'^2 - 10y^2 \end{cases}$$

$$\begin{cases} x^2 - 17y^2 = 17x'^2 - y'^2 \\ 17x^2 - y^2 = x'^2 - 17y^2 \end{cases}$$

&c. &c.

### Prop. XVIII.

If $m$ and $n$ be the roots of the quadratic equation $\varphi^2 - a\varphi + b = 0$, then will the product of the two formulæ $(x + my)$ and $(x + ny)$ be equal to $x^2 + 2axy + by^2$.

This is evident from the actual multiplication of the factors $(x + my)$, and $(x + ny)$. For

$$(x + m) + (x + ny) = x^2 + (n + m)xy + mny^2$$

And since $m$ and $n$ are the two roots of the equation $\varphi^2 - a\varphi + b$, we have, from the nature of equations, $m + n = a$, and $mn = b$; and, consequently, the product becomes $x^2 + axy + by^2$.

Hence, conversely, every quantity of the form $x^2 + axy + by^2$, may be considered as the product arising from the multiplication of two factors $(x + my)$ and $(x + ny)$, $m$ and $n$ being the roots of the quadratic equation $\varphi^2 - a\varphi + b = 0$.

Or, which is the same, $m$ and $n$ being such as to answer the conditions $m + n = a$, $mn = b$.

### Prop. XIX.

The product arising from the multiplication of the two formulæ $x^2 + axy + by^2$, and $x'^2 + ax'y' + by'^2$, is itself also of the same form.

For, by the last,

$$x^2 + axy + by^2 = (x + my)(x + ny)$$
$$x'^2 + ax'y' + by'^2 = (x' + my')(x' + ny')$$

therefore the product in question is the same as the continued product of the four latter factors. Now,

$$(x + my)(x' + my') = xx' + m(xy' + x'y) + m^2yy'$$

And since $m^2 - am + b = 0$, we have $m^2 = am - b$, whence the above formula becomes

$$xx' - byy' + m(xy' + x'y + ayy')$$

Or writing $X = xx' - byy'$
$Y = xy' + x'y + ayy'$

we have $(x + my)(x' + my') = X + mY$

so also, $(x + ny)(x' + ny) = X + nY$

Consequently, the whole of the above product is

$$= (X + mY)(X + nY) = X^2 + aXY + bY^2$$

That

That is, the product of the two formulæ

$$(x^2 + axy + by^2) \text{ and } (x'^2 + ax'y' + by'^2)$$

is itself also of the same form; and, consequently, when $x = x'$, and $y = y'$, we have

$$(x^2 + axy + by^2)^2 = X^2 + aXY + bY^2$$

Hence we have a ready way of making a square of any such formulæ as $X^2 + aXY + bY^2$, or of $r^2 + ars + bs^2$; which is done by simply writing

$$r = x^2 - by^2$$
$$s = 2xy + ay^2$$

in which expressions $x$ and $y$ may be assumed any integer numbers at pleasure.

*Exam.* 1.—Find the values of $x$ and $y$ in the equation

$$x^2 + 3xy + 5y^2 = z^2$$

Here $a = 3$, and $b = 5$; therefore the general values of $x$ and $y$ are

$$\begin{cases} x = t^2 - 5u^2 \\ y = 2tu + 3u^2 \end{cases}$$

where, for distinction sake, we write $t$ and $u$, in the above formulæ, instead of $x$ and $y$.

Whence, by assuming successively

$$t = 3, 4, 5, 6, \&c.$$
$$u = 1, 1, 1, 1, \&c.$$

we shall have the following corresponding values of $x$ and $y$:

$$x = 4, 11, 20, 31, \&c.$$
$$y = 9, 11, 13, 15, \&c.$$

*Exam.* 2.—Find the values of $x$ and $y$ in the equation

$$x^2 - 7xy + 3y^2 = z^2$$

Here, since $a = -7$, and $b = 3$; the general values of $x$ and $y$ are

$$\begin{cases} x = t^2 - 3u^2 \\ y = 2tu - 7u^2 \end{cases}$$

And making now

$$t = 4, 5, 6, 7, 8, \&c.$$
$$u = 1, 1, 1, 1, 1, \&c.$$

we obtain,

$$x = 13, 22, 33, 46, 61, \&c.$$
$$y = 1, 3, 5, 7, 9, \&c.$$

Each of which corresponding values of $x$ and $y$ answer the required conditions of the equation; and it is manifest that an infinite number of other values might be obtained by changing those of $t$ and $u$. Barlow's Theory of Numbers.

*On the Partition of Numbers.*

PROP. XX.

To find in how many different ways any proposed number may be divided into a given number of unequal parts.

Let us propose the following expression, viz.

$$(1 + x^a z) \cdot (1 + x^b z) \cdot (1 + x^c z) \cdot (1 + x^d z) \cdot (1 + x^e z) \&c.$$

and endeavour to ascertain the form that it takes when expanded by multiplication. And, first, let us suppose it to become

$$1 + Pz + Qz^2 + Rz^3 + Sz^4, \&c.$$

then it is evident, from the theory of equations, that P will be the sum of the powers

$$x^a + x^b + x^c + x^d + x^e, \&c.$$

and Q, the sum of the products, of all the possible combinations of these powers taken two and two; or an assemblage of the several powers of $x$, of which the exponents are the sums of two different terms of the series

$$a, b, c, d, e, f, \&c.$$

On the same principle, R will be an assemblage of the powers of $x$, of which the exponents are the sums of three different terms of the same series; S will be an assemblage of all the powers of $x$, of which the exponents are the sums of four different terms of the same series; and so on.

Now, it is manifest, that the powers of $x$, which are comprised in the values of P, Q, R, S, &c. will have unity for their co-efficients; if their exponents can only be formed in one way, by the quantities $a, b, c, d, e, \&c.$; but if the exponent can be be formed in many ways, by the sums of two, three, or more, terms of the same series; then will this power have a co-efficient, that contains unity as many times. For example, if $N x^n$ be found in the value of Q, this will be a proof that $n$ may be formed in N different ways from the sums of two different terms of the series $a, b, c, d, e, f, \&c.$; and if we find in the developement of the proposed factors the term $N x^n z^m$, its co-efficient N, indicates, in how many different ways the number $n$ may be the sum of $m$, different terms of the series

$$a, b, c, d, e, f, \&c,$$

Thus, the proposed product,

$$(1 + x^a z) \cdot (1 + x^b z) \cdot (1 + x^c z) \cdot (1 + x^d z) \cdot (1 + x^e z) \&c.$$

being really developed by multiplication, the result will shew immediately in how many different manners a given number may be the sum of any proposed number of different terms of the series $a, b, c, d, \&c.$: for example, if one wished to know in how many different ways the number $n$ may be formed of $m$ different terms of this series, we must ascertain the term $x^n z^m$ in the expanded expression, and the co-efficient of this term will be the number required.

In order to render this the more evident, let us take this product, composed of an infinite number of factors,

$$(1 + xz) \cdot (1 + x^2 z) \cdot (1 + x^3 z) \cdot (1 + x^4 z) \cdot (1 + x^5 z) \&c.$$

the real multiplication of which gives

$$\begin{aligned}
&1 + z(x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7 + x^8 + x^9 + \&c.) \\
&+ z^2(x^3 + x^4 + 2x^5 + 2x^6 + 3x^7 + 3x^8 + 4x^9 + 4x^{10} + 5x^{11} + \&c.) \\
&+ z^3(x^6 + x^7 + 2x^8 + 3x^9 + 4x^{10} + 5x^{11} + 7x^{12} + 8x^{13} + 10x^{14} + \&c.) \\
&+ z^4(x^{10} + x^{11} + 2x^{12} + 3x^{13} + 5x^{14} + 6x^{15} + 9x^{16} + 11x^{17} + 15x^{18} + \&c.) \\
&+ z^5(x^{15} + x^{16} + 2x^{17} + 3x^{18} + 5x^{19} + 7x^{20} + 10x^{21} + 13x^{22} + 18x^{23} + \&c.) \\
&+ z^6(x^{21} + x^{22} + 2x^{23} + 3x^{24} + 5x^{25} + 7x^{26} + 11x^{27} + 14x^{28} + 20x^{29} + \&c.) \\
&+ z^7(x^{28} + x^{29} + 2x^{30} + 3x^{31} + 5x^{32} + 7x^{33} + 11x^{34} + 15x^{35} + 21x^{36} + \&c.) \\
&+ z^8(x^{36} + x^{37} + 2x^{38} + 3x^{39} + 5x^{40} + 7x^{41} + 11x^{42} + 15x^{43} + 22x^{44} + \&c.)
\end{aligned}$$

And by means of this ſeries we may aſcertain at once in how many different ways a propoſed number may be formed of any determined number of terms of the ſeries

1, 2, 3, 4, 5, 6, 7, 8, &c.

Suppoſe, for example, it were required to find in how many different ways the number 35 may be the ſum of ſeven different terms of the ſeries

1, 2, 3, 4, 5, 6, 7, 8, &c.

Find in the ſeries, that has the multiplier $z^7$, the power $x^{35}$; and its co-efficient, 15, indicates that the number 35 may be formed fifteen different ways, by the ſums of ſeven terms of the above ſeries.

But if we take $z = 1$, and thus unite together all the equal powers of $x$, or, which is the ſame thing, if we develope by multiplication the following infinite product,

$(1+x).(1+x^2).(1+x^3).(1+x^4).(1+x^5).(1+x^6)$ &c.

we ſhall have the ſeries,

$1 + x + x^2 + 2x^3 + 2x^4 + 3x^5 + 4x^6 + 5x^7 + 6x^8 +$ &c.

in which each co-efficient indicates in how many different ways the exponent of the correſponding power of $x$ may reſult from the addition of different terms of the ſeries 1, 2, 3, 4, 5, 6, 7, &c. without regard to the number of them.

Thus it appears, that there are ſix different manners of forming the number 8, by the addition of different numbers; as follows:

$8 = 8$
$8 = 7 + 1$
$8 = 6 + 2$
$8 = 5 + 3$
$8 = 5 + 2 + 1$
$8 = 4 + 3 + 1$

It ſhould be obſerved here, that we muſt include the number itſelf, as one way of forming it; becauſe, the number of terms to be ſelected in the above ſeries being indeterminate, it neceſſarily follows, that we may conſider a ſingle term as one of the ſelections.

*Cor.* — From what has been ſaid, we learn how many ways a number may be produced by the addition of different numbers. But this condition, which requires different numbers, will no longer have place, if we tranſpoſe theſe factors to the denominator. Let us therefore conſider this caſe.

$$1 + z(x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7 + x^8 + x^9 + \text{&c.})$$
$$+ z^2(x^2 + x^3 + 2x^4 + 2x^5 + 3x^6 + 3x^7 + 4x^8 + 4x^9 + 5x^{10} + \text{&c.})$$
$$+ z^3(x^3 + x^4 + 2x^5 + 3x^6 + 4x^7 + 5x^8 + 7x^9 + 8x^{10} + 10x^{11} + \text{&c.})$$
$$+ z^4(x^4 + x^5 + 2x^6 + 3x^7 + 5x^8 + 6x^9 + 9x^{10} + 11x^{11} + 15x^{12} + \text{&c.})$$
$$+ z^5(x^5 + x^6 + 2x^7 + 3x^8 + 5x^9 + 7x^{10} + 10x^{11} + 13x^{12} + 18x^{13} + \text{&c.})$$
$$+ z^6(x^6 + x^7 + 2x^8 + 3x^9 + 5x^{10} + 7x^{11} + 11x^{12} + 14x^{13} + 20x^{14} + \text{&c.})$$
$$+ z^7(x^7 + x^8 + 2x^9 + 3x^{10} + 5x^{11} + 7x^{12} + 11x^{13} + 15x^{14} + 21x^{15} + \text{&c.})$$
$$+ z^8(x^8 + x^9 + 2x^{10} + 3x^{11} + 5x^{12} + 7x^{13} + 11x^{14} + 15x^{15} + 22x^{16} + \text{&c.})$$

We may, therefore, by means of this ſeries, find immediately in how many different manners a number may be formed by the addition of any propoſed number of terms of this ſeries, 1, 2, 3, 4, 5, 6, 7, &c. Suppoſe, for example, it were required to know in how many different ways the number 13 might be made the ſum of five integers. We muſt, in this caſe, look for the term $x^{13} z^5$, and the co-efficient of which, 18, ſhews us, that the number in queſtion, 13, may be eighteen different ways formed by the addition of five integer numbers.

### Prop. XXI.

To find in how many different ways any given number may be divided into a propoſed number of equal or unequal integral parts.

Let there be propoſed this expreſſion,

$$\frac{1}{(1-x^a z).(1-x^b z).(1-x^c z).(1-x^d z).(1-x^e z)}$$

which, being developed by diviſion, gives the ſeries

$$1 + Pz + Qz^2 + Rz^3 + Sz^4 + \text{&c.}$$

and from the firſt principles of algebra, it is evident that P is the ſum of all the powers of $x$, of which the exponents are contained in the ſeries

$$a,\ b,\ c,\ d,\ e,\ f,\ \text{&c.}$$

Alſo, Q will be an aſſemblage of the powers of $x$, of which the exponents are the ſums of two terms of the ſame ſeries, repeated or not. Likewiſe, R will be the ſums of the powers of $x$, of which the exponents are formed by the addition of three terms; and S the ſum of the powers, of which the exponents are formed by the addition of four terms, compriſed in this ſeries, and ſo on of the other co-efficients.

Conſequently, if we ſuppoſe that the expreſſions have been actually developed, and that we have collected together the ſimilar terms, we ſhall ſee in how many different ways a propoſed number, $n$, may be formed by the addition of $m$ terms, different or not, of the ſeries $a, b, c, d, e, f,$ &c.

Let us ſeek, for example, in the developed expreſſion, the term $x^n z^m$, and its co-efficient, which we will ſuppoſe N; in ſhort that the whole term will be $= N x^n z^m$; then will the co-efficient, N, ſhew in how many different ways the number $n$ may be formed by the addition of $m$ terms contained in the ſeries $a, b, c, d, e, f,$ &c. And hence we ſhall have the ſolution of a queſtion, analogous to the former one which we have been conſidering, except that in this they are not neceſſarily different terms, which was a condition in the firſt problem.

Let us apply what has been ſaid to a particular caſe, taking this expreſſion,

$$\frac{1}{(1-xz).(1-x^2 z).(1-x^3 z).(1-x^4 z).(1-x^5 z)}\ \text{&c.}$$

the actual developement of which, by diviſion, gives

If we ſuppoſe $z = 1$, and unite in one ſum all the ſimilar powers of $x$, this expreſſion is transformed into this ſeries,

$$1 + x + 2x^2 + 3x^3 + 5x^4 + 7x^5 + 11x^6 + 15x^7 + 22x^8 + \text{&c.}$$

in which each co-efficient indicates in how many different ways the exponents of the correſponding power can be formed by the addition of integers, without regard to the number of them, or whether they be equal or unequal.

For example, the term $11x^6$ ſhews that the number 6 may

may be produced eleven different ways, by the addition of whole numbers, as follows:

$6 = 6$
$6 = 5 + 1$
$6 = 4 + 2$
$6 = 4 + 1 + 1$
$6 = 3 + 3$
$6 = 3 + 2 + 1$
$6 = 3 + 1 + 1 + 1$
$6 = 2 + 2 + 2$
$6 = 2 + 2 + 1 + 1$
$6 = 2 + 1 + 1 + 1 + 1$
$6 = 1 + 1 + 1 + 1 + 1 + 1$.

Here we may remark alſo, that the propoſed number, being contained in the ſeries of numbers 1, 2, 3, 4, 5, 6, &c. is itſelf one way of forming it.

### Prop. XXII.

To find, independently of the developement by multiplication, the ſeries of the powers $x$, that were deduced by that method in Prop. XX.

Let there be propoſed, to this effect, the following expreſſion:

$$Z = (1 + xz) \cdot (1 + x^2 z) + (1 + x^3 z) \cdot (1 + x^4 z) \cdot (1 + x^5 z) + \&c.;$$

which being developed by multiplication, and arranged according to the powers of $z$, gives this ſeries:

$$Z = 1 + Pz + Qz^2 + Rz^3 + Sz^4 + Tz^5 + \&c.:$$

and it is here required to find an expeditious method of obtaining the functions P, Q, R, S, &c. of $x$; for we ſhall have, by this means, the ſolution of the queſtion propoſed.

Now it is evident, that if we write $xz$ for $z$, we ſhall have

$$(1 + x^2 z) \cdot (1 + x^3 z) \cdot (1 + x^4 z) \cdot (1 + x^5 z) \&c. = \frac{z}{1 + xz}.$$

Therefore, in ſubſtituting $xz$ for $z$, the value of the product, which was $z$, is changed into $\frac{z}{1 + xz}$; and, conſequently, ſince

$$Z = 1 + Pz + Qz^2 + Rz^3 + Sz^4 + \&c.;$$

we ſhall have

$$\frac{z}{1 + xz} = 1 + Pxz + Qx^2 z^2 + Rx^3 z^3 + Sx^4 z^4 + \&c.$$

Multiplying of which by $1 + xz$, we ſhall obtain

$$\begin{aligned} Z = 1 &+ Pxz + Qx^2 z^2 + Rx^3 z^3 + Sx^4 z^4 + \&c. \\ &+ xz + Px^2 z^2 + Qx^3 z^3 + Rx^4 z^4 + \&c. \end{aligned}$$

And this value of $z$, compared with the former, will give

$$P = \frac{x}{1 - x}, \quad Q = \frac{Px^2}{1 - x^2}, \quad R = \frac{Qx^3}{1 - x^3}, \quad S = \frac{Rx^4}{1 - x^4}, \quad \&c.$$

We ſhall have, therefore, for P, Q, R, S, &c. the following values:

$$P = \frac{x}{1 - x};$$

$$Q = \frac{x^3}{(1 - x) \cdot (1 - x^2)};$$

$$R = \frac{x^6}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3)};$$

$$S = \frac{x^{10}}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3) \cdot (1 - x^4)};$$

$$T = \frac{x^{15}}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3) \cdot (1 - x^4) \cdot (1 - x^5)};$$

&c. &c. &c.

We may, therefore, obtain ſeparately each of the ſeries of the powers of $x$, and which will ſhew in how many different ways a propoſed number may be formed, by the addition of any given number of integers: and it is evident that theſe, when converted by diviſion, will be recurring ſeries, becauſe they reſult from a fractional function of $x$.

Thus, the firſt expreſſion, $P = \frac{x}{1 - x}$, gives the geometrical progreſſion

$$x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7 + \&c.;$$

which indicates that every number is contained once in the ſeries of integers 1, 2, 3, 4, &c. as is otherwiſe evident from firſt principles.

The ſecond expreſſion, $\frac{x^3}{(1 - x) \cdot (1 - x^2)}$, gives the ſeries

$$x^3 + x^4 + 2x^5 + 2x^6 + 3x^7 + 3x^8 + 4x^9 + 4x^{10} + \&c.;$$

in which the co-efficient of each term ſhews in how many ways the exponent $x$ may be parted into two unequal parts. For example, the term $4x^9$ ſhews that the number 9 may be ſeparated, in four different ways, into two unequal parts. If we divide this ſeries by $x^3$, we ſhall have that which is derived from the fraction $\frac{1}{(1 - x) \cdot (1 - x^2)}$, as follows:

$$1 + x + 2x^2 + 2x^3 + 3x^4 + 3x^5 + 4x^6 + 4x^7 + \&c.;$$

of which we will ſuppoſe the general term $= Nx^n$. Now, from the generation of this ſeries, we know that the co-efficient N indicates in how many different ways the exponent $n$ may be formed by the addition of the numbers 1 and 2; and ſince the general term of the firſt ſeries is $Nx^{n+3}$, we may thence draw this

### Theorem.

*Any number, $n + 3$, may be ſeparated into two unequal parts, in as many ways as the number $n$ may be formed by the addition of the numbers 1 and 2.*

The third expreſſion, $\frac{x^6}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3)}$, being reduced into a ſeries, will give

$$x^6 + x^7 + 2x^8 + 3x^9 + 4x^{10} + 5x^{11} + 7x^{12} + 8x^{13} + \&c.$$

And the co-efficient of each term, in this ſeries, ſhews in how many different ways the exponent of the correſponding power of $x$ may be ſeparated into three unequal parts. But the developement of the fraction,

$\frac{1}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3)}$, gives the ſeries

$$1 + x + 2x^2 + 3x^3 + 4x^4 + 5x^5 + 7x^6 + 8x^7 + \&c.;$$

of which, if we ſuppoſe $N x^n$ to repreſent the general term, the co-efficient N will indicate in how many different ways the number $n$ may be formed, by the addition of the three numbers 1, 2, and 3; and the general term of the foregoing ſeries being $N x^{n+6}$, we hence draw the following theorems.

### Theorem II.

*Any number, $n + 6$, may be divided into three unequal parts, in as many ways as the number n may be formed by the addition of the three numbers 1, 2, and 3.*

The fourth expreſſion, $\frac{x^{10}}{(1-x).(1-x^2).(1-x^3).(1-x^4)}$, when developed in a ſeries, gives

$$x^{10} + x^{11} + 2x^{12} + 3x^{13} + 5x^{14} + 6x^{15} + 9x^{16} + 11x^{17} + \&c.$$

where the co-efficient of each term indicates in how many different ways the exponent of the correſponding power may be ſeparated into four unequal parts; but the transformation of the expreſſion $\frac{1}{(1-x).(1-x^2).(1-x^3).(1-x^4)}$ into a ſeries, or the diviſion of the one above by $x^{10}$, produces

$$1 + x^1 + 2x^2 + 3x^3 + 5x^4 + 6x^5 + 9x^6 + 11x^7 + \&c.;$$

of which, ſuppoſing the general term to be $N x^n$, it follows, that the co-efficient N ſhews in how many different ways the number $n$ may be formed by the addition of the four numbers 1, 2, 3, 4; and hence, again, we deduce the following

### Theorem III.

*Any number, $n + 10$, may be divided into four unequal parts, in as many ways as the number n may be formed by the addition of the four numbers 1, 2, 3, and 4.*

In general, therefore, if the expreſſion $\frac{1}{(1-x).(1-x^2).(1-x^3).\ \&c.\ (1-x^m)}$ be converted into a ſeries, and of which we take $N x^n$ to repreſent the general term; the co-efficient N will always indicate in how many different ways the number $n$ may be formed by the addition of the numbers 1, 2, 3, 4, &c. $m$.

But if the expreſſion $\frac{x^{\frac{m.\overline{m+1}}{2}}}{(1-x).(1-x^2).(1-x^3).(1-x^4)\ \&c.\ (1-x^m)}$, be converted into a ſeries, the general term will be $N x^{n+\frac{m.\overline{m+1}}{2}}$; and of which the co-efficient N ſhews in how many ways the number $n + \frac{m.\overline{m+1}}{1.2}$ may be divided into $m$ unequal parts; and hence we draw the following general

### Theorem IV.

*Any number, $n + \frac{m.\overline{m+1}}{1.2}$, may be divided into m unequal parts, in as many ways as the number n may be formed by the addition of the numbers 1, 2, 3, 4, &c. m.*

Having thus explained the law for the partition of numbers into unequal parts, we ſhall proceed to the inveſtigation of the propoſition, which includes both equal and unequal parts.

### Prop. XXIII.

To aſcertain, independently of the developement by diviſion, the ſeries of the powers that were deduced by this method in Prop. XXII.

To this effect, let there be propoſed the expreſſion

$$Z = \frac{1}{(1-xz).(1-x^2z).(1-x^3z).(1-x^4z).(1-x^5z)}$$

and ſuppoſe that, from actual diviſion, it becomes

$$Z = 1 + Pz + Qz^2 + Rz^3 + Sz^4 + Tz^5 + \&c.$$

and here, it is evident, that if we put $xz$, inſtead of $z$, in the above fraction, we ſhall have

$$(1-xz)Z = \frac{1}{(1-x^2z).(1-x^3z).(1-x^4z).(1-x^5z)\ \&c.}$$

and the ſame ſubſtitution having been made in the foregoing ſeries, there will reſult

$$(1-xz)Z = 1 + Pxz + Qx^2z^2 + Rx^3z^3 + Sx^4z^4 + \&c.$$

Now, multiplying the firſt ſeries by $(1-xz)$, we ſhall have

$$(1-xz)Z = 1 + Pz + Qz^2 + Rz^3 + Sz^4 + \&c. \\ - xz - Px z^2 + Qx z^3 + Rx z^4 + \&c.$$

And hence by compariſon, we have

$$P = \frac{x}{1-x}, Q = \frac{Px}{1-x^2}, R = \frac{Qx}{1-x^3}, S = \frac{Rx}{1-x^4}, \&c.$$

which gives for P, Q, R, S, &c. the following independent values; *viz.*

$$P = \frac{x}{1-x};$$

$$Q = \frac{x^2}{(1-x).(1-x^2)};$$

$$R = \frac{x^3}{(1-x).(1-x^2).(1-x^3)};$$

$$S = \frac{x^4}{(1-x).(1-x^2).(1-x^3).(1-x^4)}.$$

Theſe expreſſions differ from thoſe found in the foregoing propoſition, only in this; that the numerators in theſe have leſs exponents than thoſe in the preceding caſe; and, conſequently, the ſeries that ariſe from the developement of theſe and the foregoing will perfectly agree with reſpect to their co-efficients, as is otherwiſe evident from a compariſon of the two ſets of ſeries, which we have deduced at Prop. XXI. and Prop. XXII. And hence, without a repetition of the proceſs, we may deduce the following theorems, analogous to thoſe derived from Prop. XXIII.

### Theorems.

1. *Any number, $n + 2$, may be divided into two parts, in as many different ways as the number n may be formed by the addition of the numbers 1 and 2.*

2. *Any number, $n + 3$, may be divided into three parts, in as many different ways as the number n can be formed by the addition of the numbers 1, 2, 3.*

3. *Any number, $n + 4$, may be divided into four parts, in as many different ways as the number n may be formed by the addition of the numbers 1, 2, 3, 4.*



4. *And,*

4. *And, generally, as many different ways as there are of forming the number n by the addition of the numbers* 1, 2, 3, 4, .... *m; ſo many different ways may the number* $n + m$ *be divided into m parts.*

Having, therefore, to find in how many ways a given number may be divided into *m* unequal parts; and how many ways it may be divided into parts equal, or unequal; theſe two queſtions will be reſolved, from the foregoing theorems, and thoſe deduced from Prop. XXII. if we can aſcertain in how many ways a number may be formed by the addition of the numbers 1, 2, 3, 4, &c. *m*, from a compariſon of which we eaſily deduce the following

THEOREMS.

5. *The number n may be parted into m unequal parts, in as many ways as the number* $n - \frac{m \cdot m-1}{2}$ *may be formed by the addition of the numbers* 1, 2, 3, 4, .... *m.*

6. *The number n may be parted into m equal, or unequal parts, as many ways as the number* $n - m$ *may be formed by the addition of the numbers* 1, 2, 3, 4, .... *m.*

From theſe two theorems (which are, in effect, the two general theorems deduced from Props. XXIII. and XXIV., except being in another form) we may derive theſe other two

THEOREMS.

7. *The number n may be divided into m unequal parts, in as many ways as the number* $n - \frac{m \cdot m-1}{1 \cdot 2}$ *may be divided into m parts equal, or unequal.*

8. *The number n may be divided into parts equal, or unequal in as many ways as the number* $n + \frac{m \cdot m-1}{1 \cdot 2}$ *may be parted into m unequal parts.* Euler's Analyſis Infinitorum.

We ſhall now conclude this article by enumerating a few curious properties of numbers, that could not properly be introduced under any of the preceding heads; but for their inveſtigations and demonſtrations we muſt refer the reader to the works above quoted.

*Miſcellaneous Numerical Properties.*

1. If *a* be a prime number, and *x* any number whatever not diviſible by *a*, then will $x^{a-1}$ be always diviſible by *a*.

2. Every integer number is the ſum of one, two, or three triangular numbers; of one, two, three, or four ſquare; of one, two, three, four, or five pentagonal numbers; and ſo on for hexagonal, heptagonal, &c. numbers. This curious property was firſt diſcovered by Fermat, and propoſed by him without demonſtration, at page 180 of his edition of Diophantus; the caſe of ſquares has been proved both by Euler and La Grange, and that of the triangular numbers by Le Gendre; beyond which it ſtill remains without demonſtration, having reſiſted the efforts of ſeveral very diſtinguiſhed analyſts.

3. If *n* be a prime number, the product

$$1 \cdot 2 \cdot 3 \cdot 4 \ldots\ldots (n-1) + 1$$

is diviſible by *n*, ſo alſo is the product

$$1^2 \cdot 2^2 \cdot 3^2 \cdot 4^2 \ldots \left(\frac{n-1}{2}\right)^2 \pm 1,$$

the ambiguous ſign being + when *n* is a prime number of the form $4a - 1$, and — when it is of the form $4a + 1$.

4. The expanded binomial $(1-1)^n$

$$= 1 - n + \frac{n(n-1)}{1 \cdot 2} - \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3} + \&c. = 0;$$

and if theſe terms be reſpectively multiplied by the ſeries 1, 2, 3, 4, &c. or any power of theſe terms except the *n*th, the whole expreſſion will be ſtill equal to zero.

5. The continued product $1 \cdot 2 \cdot 3 \cdot 4 \ldots\ldots n$ is expreſſed by the formula $n^n - n(n-1)^n + \frac{n(n-1)}{1 \cdot 2}(n-2)^n - \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3}(n-3)^n + \&c.$

6. Every ſquare number is either diviſible by 5, or will leave for a remainder plus or minus 1.

Every cube number is either diviſible by 7, or will leave alſo the ſame remainder $\pm 1$; and generally we have

| | | | |
|---|---|---|---|
| $x^2 = 3n$, | or $3n + 1 = 5n$, | or $5n \pm 1$ | |
| $x^3 =$ | - - | $= 7n$, | or $7n \pm 1$ |
| $x^4 = 5n$, | or $5n + 1 =$ | - - | - |
| $x^5 =$ | - - | $= 11n$, | or $11n \pm 1$ |
| $x^6 = 7n$, | or $7n + 1 = 13n$, | or $13n \pm 1$ | |
| $x^7 =$ | - - | $=$ | - - - |
| $x^8 =$ | - - | $= 17n$, | or $17n \pm 1$ |
| $x^9 =$ | - - | $= 19n$, | or $19n \pm 1$ |
| $x^{10} = 11n$, | or $11n + 1 =$ | - | - - |
| $x^{11} =$ | - - | $= 13n$, | or $23n \pm 1$ |
| $x^{12} = 13n$, | or $13n + 1 =$ | | |

which formulæ are very convenient for determining whether a propoſed number be a complete power without the trouble of extraction.

We might have added here ſeveral other curious properties of numbers; but having already extended this article to a conſiderable length, we muſt refer the reader who is deſirous of entering farther into this ſubject, to Barlow's Theory of Numbers, where he will find a great variety of ſuch properties, with their ſeveral applications to arithmetic, analyſis, geometry, trigonometry, &c.

NUMBERS, *for the Manner of characteriſing*, ſee NOTATION.

*For that of expreſſing or reading thoſe already characteriſed*, ſee NUMERATION.

NUMBER, *for the Meaſure of a.* See MEASURE.

NUMBER, *Golden*, in *Chronology.* M. Caſſini defines the golden number by the number of years elapſed ſince that which had the new moon on its firſt day; as that of the year 1500, whoſe golden number was 0; which he takes for his epocha.

NUMBER, *Golden*, is alſo uſed, with ſomewhat leſs propriety, for a period of 19 years, invented by Meton the Athenian; at the end whereof, the ſame lunations return in the ſame days, though not preciſely in the ſame hour and minute of the day; but within an hour and a half of the ſame time.

In which ſenſe, golden number amounts to the ſame with what we otherwiſe call *lunar cycle*, or *Metonic year.*

Hence this period, called by the Greeks *enneadecaeteris*, is not perfectly juſt; there being a proemptoſis, or leap, at the end of each 312 years; *i. e.* in that time the lunations fall out a day ſooner than the golden number expreſſes them.

This, among other things, was what engaged pope Gregory XIII. to reform the calendar, to throw out the golden number, and ſubſtitute the cycle of epacts inſtead of it, for the

the uſe of the golden number, which, in the Julian calendar, ſerves to find the new moons, only ſerves, in the Gregorian, to find the cycle of epacts.

This number is ſaid to have had its name, *golden*, from the extent of its uſe; or, otherwiſe, becauſe the Athenians received it with ſo much applauſe, that they had it written in the public market in letters of gold. See *Metonic* CYCLE, and EPACT.

NUMBER, in *Grammar*, is a modification of nouns, verbs, &c. to accommodate them to the varieties of their objects, conſidered with regard to number.

Nouns, or names, agreeing to ſeveral things, may be conſidered either as applied to one of thoſe things ſingularly, or to a number of them; and thoſe either conſidered as ſeveral, or as united. To diſtinguiſh theſe caſes, two numbers have been invented, the *ſingular* and *plural*.

When a noun indicates an object conſidered as ſingle, or alone, or a number of them conſidered as united together, it is ſaid to be of the *ſingular* number; as a tree, a troop, a temple.

When it indicates ſeveral objects, and thoſe as diſtinct, it is of the *plural* number: as trees, or temples. Thus, when I ſpeak of myſelf, as making part of ſeveral others, inſtead of I, I ſay, we, &c.

The Greeks have a third number, which they call the *dual* number, as ſignifying two. The Hebrews have ſomething like it; but then it only takes place when the words ſignify a thing double, either by nature, as the hands, the eyes, &c. or by art, as ſciſſars, tongs, &c. As to common and appellative names, they ſeem all naturally to require a plural number; yet there are ſeveral, which have none, as the name of gold, ſteel, &c.

The difference of numbers in nouns is expreſſed by a difference of termination or ending.

In Engliſh, the ſingular is uſually converted into plural, by adding *s*; as tree, trees; hand, hands; &c. Where the pronunciation requires it, as when the ſingular ends in *s* or *x*, *ſh* or *ch*, it is uſually done by the addition of *es*, inſtead of *s*.

The plurals of adjectives, though varied from the ſingulars in moſt other languages, yet in Engliſh are generally the ſame.

NUMBERS, in *Poetry*, *Oratory*, *Muſic*, &c. are certain meaſures, proportions, or cadences, which render a verſe, period, or ſong agreeable to the ear.

*Poetical* and *proſaic* numbers are ſomewhat different.

NUMBERS, *Poetical*, conſiſt in a certain harmony in the order, quantities, &c. of the feet and ſyllables; which make the piece muſical to the ear, and fit for ſinging; for which all the verſes of the ancients were intended. See RHYTHM.

It is of theſe numbers Virgil ſpeaks in his fourth eclogue:

——— "Numeros memini, ſi verba tenerem."

And again, in the ſixth eclogue:

"Tum vero in numerum faunoſque feraſque videres
Ludere."

The numbers are what conſtitute the air and character of a verſe; and denominate it ſmooth, or ſoft, or low, or rough, or ſonorous. The following lines of Milton furniſh an inſtance of ſoft, eaſy numbers:

"Then feed on thoughts, which voluntary move
Harmonious numbers; as the tuneful bird
Sings darkling, and, in ſhadieſt covert hid,
Tunes her nocturnal note. ——"

How different from the numbers of theſe!

"Arms meet with arms, faucheons with faucheons claſh,
And ſparks of fire, ſtruck out from armour, flaſh."

NUMBERS, *Rhetorical*, or *Proſaic*, are a ſort of ſimple unaffected harmony, leſs glaring than that of verſe, yet ſuch as is perceived, and affects the mind with pleaſure. The numbers are that, by which the ſtyle is ſaid to be eaſy, free, round, flowing, &c. See STYLE.

A fine inſtance of numbers we have in that paſſage of Tully for Marcellus: "Nulla eſt tanta vis, tantaque copia, quæ non ferro ac viribus debilitari frangique poſſit." All the beauty of which would be entirely loſt to any tolerable ear, if the numbers were a little inverted, thus: "Nulla eſt vis tanta, et copia tanta, quæ non poſſit debilitari frangique viribus et ferro."

Numbers are things abſolutely neceſſary in all writings, and even in all ſpeech. Hence Ariſtotle, Tully, Quintilian, &c. lay down abundance of rules as to the beſt manner of intermixing dactyls, ſpondees, anapeſta, iambuſes, choraic, and dichoraic moloſſuſes, &c. in order to have the numbers perfect.

The ſubſtance of what we have ſaid, is reducible to what follows: 1. The ſtyle becomes numerous, by the alternate diſpoſition and temperature of long and ſhort ſyllables; ſo as that the multitude of ſhort ones neither render it too haſty, nor that of longer ones too ſlow and languid. Thus Tully to Cæſar: "Domuiſti gentes immanitate barbaras, multitudine innumerabiles, locis infinitas, omni copiarum genere abundantes, &c."

Sometimes, indeed, long or ſhort ſyllables are deſignedly thrown together, without any ſuch mixture, to paint the celerity or ſlowneſs of a thing by that of the numbers; as,

"Quadrupedante putrem ſonitu quatit ungula campum."
Æneid. l. 8.

"Luctantes ventos, tempeſtateſque ſonoras."
Id. l. 1.

2. The ſtyle becomes numerous by the intermixing words of one, two, or more ſyllables; *e. g.* "Vivis; et vivis non ad deponendam, ſed ad confirmandam audaciam." Whereas the too frequent repetition of monoſyllables renders the ſtyle pitiful and grating: *e. gr.* "Hac in re nos hic non ferit."

3. It contributes greatly to the numerouſneſs of a period; to have it cloſed by magnificent and well-ſounding words; as, "Qui locus quietis ac tranquillitatis pleniſſimus fore videbatur, in eo maximæ moleſtiarum, et turbulentiſſimæ tempeſtates extiterunt."

4. The numbers depend not only on the nobleneſs of the words in the cloſe, but on thoſe of the whole tenor of the period; as in that fine oration of Cicero for Fonteius, a brother of one of the Veſtal maids; "Nolite pati, judices, aras deorum immortalium, Veſtæque matris, quotidianis virginum lamentationibus de veſtro judicio commoveri."

5. To have the period flow eaſily and equably, the harſh concurrence of letters and words is to be very ſtudiouſly avoided, particularly the frequent meeting of rough conſonants; as *ars ſtudiorum*, *rex Xerxes*: the beginning the firſt ſyllable of a word with the laſt of the preceding; as, *Res mihi inviſæ ſunt*: the frequent repetition of the ſame letter or ſyllable; as in that verſe of Ennius:

"Africa terribili tremit horrida terra tumultu;"

and the frequent uſe of like ending words; as *amatrices*, *ajutrices*, *præſtigiatrices*, *fuerunt*. See JUNCTURE.

Laſtly, the utmoſt care is to be taken, leſt in aiming at *oratorial* numbers, you ſhould fall into *poetical* ones; and inſtead of proſe write verſe; which even Cicero himſelf is ſometimes guilty of: witneſs "Cum loquitur, tanti fletus gemituſque fiebant."

With regard to Engliſh compoſition, the following cautions ſhould be obſerved: a number of monoſyllables ſhould not be crowded together, nor ſeveral words of the ſame termination, eſpecially if the accent falls on the ſame ſyllable in each of them; nor ſhould a ſentence end with a monoſyllable: to which may be added, that very long words are not ſuited to the beginning or concluſion of a period. Ward's Orat. vol. i. p. 380, &c.

NUMBERS, *Planetary*. The numbers which are uſually underſtood by the denomination *planetary*, are thoſe which are, or may be, applied in planetary clocks, orreries, and planetaria, in the conſtruction of their wheels and pinions; for the deſired rotations and revolutions of the balls that repreſent the planets, depend on the reſpective numbers of teeth employed in ſuch wheels and pinions. Theſe numbers are, therefore, of great importance in the repreſentation of planetary motion, inaſmuch as the relative velocities are entirely regulated thereby, and the addition or omiſſion of a ſingle tooth in either a wheel or pinion may produce an error in defect or exceſs of days, weeks, or months, in the whole period, accordingly as the planet has a ſhort or long period to revolve in. In any planetary machine, the velocity of the firſt moving wheel or pinion muſt be to the velocity of the laſt in a given pair, or in a given train of wheels and pinions, in the ſame proportion, as nearly as may be, as the period aſſumed for the revolution of the firſt is to the period intended to be produced in a planet immediately connected with the laſt, which is ſometimes called the planetary wheel, though, properly ſpeaking, they are all planetary wheels, by reaſon of their teeth being made to conſiſt of planetary numbers, previouſly calculated. To aſcertain numbers ſuitable for planetary wheelwork, both as to accuracy and practical convenience, is to ſelect out of all the infinite variety of numerical figures, that permutation would produce, thoſe particular relative numbers that fulfil the conditions beſt, and that could not be changed for others without diſadvantage; and various ingenious men have deviſed methods of determining ſuch numbers, though with different degrees of ſucceſs, from the time of Huygens and Roemer down to the preſent moment. Graham, Rowley, Deſaguliers, Martin, and Ferguſon, have each laboured to procure good planetary numbers for their reſpective machines, and have left behind them models of different conſtructions, which have been copied by the Engliſh inſtrument makers, who have from time to time ſucceeded them, though it will preſently appear, that none of theſe models effect a good repreſentation of the planetary motions; for, in the firſt place, the tables of thoſe motions were not ſufficiently correct during the lives of thoſe authors; in the next place, the moſt accurate numbers were not aſcertained for producing the motions they aimed at; and thirdly, five primary planets and eight ſecondaries have been diſcovered ſince their time, for which no planetary numbers were or could be calculated on that account. Theſe diſcoveries in aſtronomy have, however, lately led to correſponding improvements in planetary mechaniſm, and a clergyman, who has made planetary numbers a ſubject of his ſtudies, and to whom we are indebted for this article, as well as for ſeveral others connected with it, has ſuperintended the conſtruction of different illuſtrative machines for himſelf or friends, which are as yet unknown to the public, but which it is our intention to deſcribe under their proper titles of ORRERY and PLANETARIUM, when we arrive at thoſe articles. In the mean time, the reader will be enabled to judge of the comparative merits of ſuch machines, by a careful peruſal of our preſent article, which naturally divides itſelf into three heads; *viz.*

1ſt. That which relates to the exact periods of the planetary revolutions;

2dly. That which regards the periods as produced by wheelwork already conſtructed; and,

3dly. That which regards the calculation of planetary numbers intended to produce an exact repreſentation of thoſe periods.

For the ſake of perſpicuity, we propoſe to confine ourſelves to this order; but each of the two laſt heads will be ſubdivided into diſtinct *caſes*, for the purpoſe of affording practical examples in each caſe, ſuch as may ſerve at once to illuſtrate the theory, and to promote the practical application of planetary numbers, in the examination and actual conſtruction of machines for illuſtrating the ſolar ſyſtem.

The firſt head that preſents itſelf to our conſideration is that which relates to the exact periods of the planetary revolutions themſelves, ſo far as the preſent ſtate of our knowledge goes; for ſhould our data be aſſumed erroneouſly, our calculations depending on them will be defective in accuracy. We are therefore unwilling to copy the accounts of our predeceſſors, which have been handed down without due attention to correctneſs, and which our contemporaries have not taken the trouble to correct, ſince the moſt perfect tables were publiſhed, out of which we collect the tropical revolutions, ſubjoined, as publiſhed in La Lande's laſt edition, which revolutions are preferable to the periodic revolutions on account of their allowing for the preceſſion (or retroceſſion) of the equinoctial points, and thereby making the motions correſpondent to the ſigns as given in the Nautical Almanac and White's Ephemeris, which regiſter the apparent places of the heavenly bodies, and phenomena ariſing out of their relative motions.

The tables of the planetary motions are ſo arranged in columns for years, months, days, hours, minutes, and ſeconds, that we may readily collect from them the mean motion in its orbit of any planet correſponding to any given amount of time; or, on the contrary, the time correſponding to any given quantity of mean motion; and if we aſſume twelve ſigns, or an entire revolution in the ecliptic, as the motion given for each planet, we ſhall have the times correſponding, as we have arranged them below, for the tropical periods of thoſe planets which have had their tables completed. We will take them in the order of their diſtances from the ſun thus:

| | s | o | ′ | ″ | | |
|---|---|---|---|---|---|---|
| MERCURY. | 11 | 26 | 2 | 12 | = | 87 days. |
| | 0 | 3 | 55 | 19 | = | 23 hours. |
| | 0 | 0 | 2 | 23 | = | 14 minutes. |
| | 0 | 0 | 0 | 6 | = | 35.2 ſeconds. |
| The amount | 12 | 0 | 0 | 0 | = | $87^d\ 23^h\ 14^m\ 35^s.2$ for the whole tropical period. |
| VENUS. | 11 | 28 | 53 | 9 | = | 224 days. |
| | 0 | 1 | 4 | 5 | = | 16 hours. |
| | 0 | 0 | 2 | 44 | = | 41 minutes. |
| | 0 | 0 | 0 | 2 | = | 30 ſeconds. |
| The amount | 12 | 0 | 0 | 0 | = | $224^d\ 16^h\ 41^m\ 30'$ for the tropical period. |

EARTH.

| | ° | ′ | ″ | | |
|---|---|---|---|---|---|
| EARTH. | 11 | 29 | 45 | 40.5 | = 365 days. |
| | 0 | 0 | 12 | 19.2 | = 5 hours. |
| | 0 | 0 | 1 | 58.3 | = 48 minutes. |
| | 0 | 0 | 0 | 2 | = 48 (alſo 49) ſeconds. |
| The amount | 12 | 0 | 0 | 0 | = $365^{d}\ 5^{h}\ 48^{m}\ 48^{s}$ or $49^{s}$ for the ſolar year. |
| MARS. | 6 | 11 | 17 | 9.4 | = 365 days. |
| | 5 | 18 | 13 | 36.8 | = 321 days. |
| Sum | 11 | 29 | 30 | 46.2 | = 686 days. |
| | 0 | 0 | 28 | 49.4 | = 22 hours. |
| | 0 | 0 | 0 | 24.4 | = $18^{m}\ 37^{s}$. |
| The amount | 12 | 0 | 0 | 0 | = $686^{d}\ 22^{h}\ 18^{m}\ 37^{s}$ for the tropical period. |
| JUPITER. | 1 | 0 | 20 | 31.7 | = 365 days. |
| Multiply by | | | | 11 | |
| | 11 | 3 | 45 | 48.7 | = 365 × 11 = 4015 days. |
| | 0 | 25 | 46 | 12 | = 310 days more. |
| | 0 | 0 | 24 | 56.3 | = 5 days in addition. |
| Sum | 11 | 29 | 56 | 57 | = 4330 entire days. |
| | 0 | 0 | 2 | 54.6 | = 14 hours. |
| | 0 | 0 | 0 | 8.4 | = 40½ minutes. |
| The amount | 12 | 0 | 0 | 0 | = $4330^{d}\ 14^{h}\ 40^{m}\ 30^{s}$ for the tropical period. |
| SATURN. | 0 | 12 | 13 | 36.8 | = 365 days. |
| Multiply by | | | | 29 | |
| | 11 | 24 | 34 | 47.2 | = 365 × 29 = $10585^{d}$ |
| | 0 | 5 | 11 | 32 | = 155 days more. |
| | 0 | 0 | 12 | 3.6 | = 6 days in addition. |
| Sum | 11 | 29 | 58 | 22.8 | = 10746 entire days. |
| | 0 | 0 | 1 | 35.5 | = 19 hours. |
| | 0 | 0 | 0 | 1.7 | = 20 minutes. |
| The amount | 12 | 0 | 0 | 0 | = $10746^{d}\ 19^{h}\ 20^{m}$ for the tropical period. |
| GEORGIAN or HERSCHEL. | 0 | 4 | 17 | 44.2 | = 365 days. |
| Multiply by | | | | 9 | |
| | 1 | 8 | 39 | 37.8 | |
| Again by | | | | 9 | |
| | 11 | 17 | 56 | 40.2 | = 81 × 365 = 29565 |
| Add more | 0 | 8 | 35 | 28.4 | = 2 × 365 = 730 |
| Alſo | 0 | 3 | 24 | 47 | = 290 |
| And | 0 | 0 | 2 | 49.5 | = 4 |
| Sum | 11 | 29 | 59 | 45.1 | = 30589 days. |
| | 0 | 0 | 0 | 14.1 | = 8 hours. |
| | 0 | 0 | 0 | 0.8 | = 27 minutes. |
| The amount | 12 | 0 | 0 | 0 | = $30589^{d}\ 8^{h}\ 27^{m}$ for the tropical period. |

The periods thus aſcertained agree very nearly with thoſe given by profeſſor Vince, as copied from La Lande's Report without further examination, except in the inſtance of Herſchel, in which there is a difference of upwards of 222 days!

How ſo great a variation has ariſen between the tables and the period aſſigned to Georgian by ſo able and accurate an aſtronomer as La Lande, we are left to conjecture. In one part of his valuable work, this author ſays that the tropical diurnal motion of this planet is 42″ 678026, which is probably the daily motion at firſt aſſigned as an approximate motion, before the true one was aſcertained, and which has not been ſubſequently corrected; and if we divide 1296000″, the number of ſeconds in the ecliptic, by this number, we ſhall have a period of 30366.91528 days, or 83 tropical years, 51 days, 19 hours, and 37.44 ſeconds; but, according to the laſt edition of the tables, the mean tropical daily motion, on an average of 365 days, comes out only 42″ 36712, by which, if we divide 1296000″, as before, we ſhall gain a period of more than 30589 days, which agreement with our period juſt aſcertained from the tables, conſtitutes a check on our proceſs of collecting the period from the ſaid tables. Indeed, ſince the diſcovery was made of this error in La Lande's Report of the period of Georgian, (which was communicated to Dr. Thomas Young during the time of his lecturing at the Royal Inſtitution, and corrected in his lectures), we learn that baron Von Zach, of Saxe Gotha, has given a period of 30589.36 days to this planet, which circumſtance corroborates our former concluſion, which we here mention, not only becauſe it is connected with our preſent article, but alſo becauſe profeſſor Vince, Dr. Olinthus Gregory, Dr. Kelly, and other modern writers on aſtronomy, have copied the error we have here pointed out, and have involuntarily lent their ſanction to its propagation.

With reſpect to the exact length of the ſolar year, the determinations of Dr. Halley, Flamſtead, and ſir Iſaac Newton, as well as of Caſſini and Mayer, have yielded, in public opinion, to thoſe of La Lande and De la Caille, the former of whom, in his "Memoire ſur la veritable Longueur de l'Année aſtronomique," which gained the prize propoſed by the Royal Society of Copenhagen for the year 1780, by comparing a great number of the moſt diſtant and authentic obſervations, determined the length of the mean ſolar year to be $365^{d}\ 5^{h}\ 48^{m}\ 48^{s}$; but De la Caille's determination of $49^{s}$ has been followed by Von Zach in his "Abridgment of the Solar Tables," while, as Biot informs us in his "Traité Elementaire d'Aſtronomie Phyſique," 1810, M. de Lambre in his laſt tables makes the ſolar year $365^{d}.242264$, or $365^{d}\ 5^{h}\ 48^{m}\ 51^{s}.696$, which accords very nearly with Caſſini's determination from a mean of all the authentic obſervations on the equinoxes. But if we adopt, as our ſtandard, a period coming within one ſecond of the mean of all theſe determinations, the other periods to be compared with it, and conſtituting ſo many ratios, will not be deemed inaccurate.

Of the tropical revolutions of the four diminutive planets, that have been diſcovered within the preſent century, the periods are not yet ſo accurately known, as to exclude future corrections from time to time, as obſervations may be multiplied; we therefore caution our readers againſt conſidering the periods at preſent aſſigned to them, as deſerving any other name than *approximate*, or approaching towards the truth. We have carefully examined and compared both the French and German accounts, that have hitherto been given, of the elements of theſe planets, and according to the preſent ſtate of our information (1813), the following may be conſidered as the moſt correct tropical periods;

periods; which, therefore, we adopt for the preſent till more accurate ones are deduced: *viz.*

| | D. | H. | M. |
|---|---|---|---|
| Of Veſta | 1335 | 0 | 23 |
| Juno | 1590 | 17 | 35 |
| Ceres | 1681 | 6 | 15 |
| Pallas | 1681 | 10 | 26 |

*The Sun.*—The period of the ſun's rotation, as it regards a ſtar or fixed point, has been given differently by different authors; ſome making it $25^d\ 6^h$, others $25^d\ 24^h\ 8^m$, and others $25^h\ 15^m\ 16^s$. But the time moſt to be depended on, is that which La Lande determined from obſervations made in the beginning of the year 1798: at which time, the writer of this article recollects having noticed the continuance of the ſame ſolar ſpot for nearly three entire rotations of the ſun, before it changed or diſappeared. The memoir was read at the public ſitting of the French National Inſtitute, in which the ſpot is ſtated to have returned to the ſame ſituation relatively to the earth in $27^d\ 7^h\ 37^m\ 28^s$; from which was deduced the period $25^d\ 10^h$, for the exact time of a rotation, as it reſpects a fixed point in the heavens. This period was deduced in the following manner: the exact quantity of the ſun's apparent motion in the ecliptic, correſponding to $27^d\ 7^h\ 37^m\ 28^s$, was aſcertained from the ſolar tables, which may be called $t$; then as $360° + t : 27^d\ 7^h\ 37^m\ 28^s :: 360° : 25^d\ 10^h\ 0^m$, for the exact time of a rotation; which we will conſider as ſufficiently accurate, till ſome ſolar ſpot of longer continuance may hereafter appear.

*The Moon.*—As the different periods of the moon's revolution with regard to the ſun, her node, and apogee, have been given agreeably to La Lande's lateſt determination, under our article Moon, it would not be neceſſary to enter on the ſubject here, provided the years there ſtated had been tropical years of $365^d.24222$, inſtead of civil years of $365^d$ each; but as the tropical or ſolar year is taken in our calculation of planetary numbers, as the ſtandard by which the periods of the planets are meaſured, it is requiſite to convert the lunar numbers into terms of the ſame denomination. The tropical period of the node is taken, according to the beſt tables, at $6798^d\ 4^h\ 52^m\ 52^s$; which time, divided by 365.24222, gives $18^y\ 223^d\ 19^h\ 41^m\ 24^s$ for the ſaid period in tropical years; and $3231^d\ 8^h\ 34^m\ 57^s.6$, the tropical period of the apogee, divided by the ſame numbers, produces $8^y\ 309^d\ 10^h\ 4^m\ 45^s$ of a ſimilar denomination: from which periods, lunar wheels muſt be calculated, in order that the moon's motions may be referred to the ecliptic, and the phenomena indicated agreeably to true ſolar time.

*Jupiter's Moons.*—The periods of Jupiter's moons, to be repreſented by wheelwork in any machine, are the ſynodic, which being of frequent recurrence, are now aſcertained with great accuracy, agreeably to the ſubjoined table, *viz.*

| Sat. | D. | H. | M. | S. |
|---|---|---|---|---|
| 1. | 1 | 18 | 28 | 36 |
| 2. | 3 | 13 | 17 | 54 |
| 3. | 7 | 3 | 59 | 36 |
| 4. | 16 | 18 | 5 | 7 |

We omit giving, in this place, the periods of the other ſecondaries, which will be given in their places; becauſe their motions afford no phenomena of ſervice in navigation or geography, and are therefore omitted in planetary machines, as being calculated to enhance the expence, without being of any real ſervice in explaining the ſyſtem.

Our ſecond head of this article is that which regards the periods of the planets, as produced by wheelwork already conſtructed, and which will enable the reader to appreciate the accuracy of any numbers adopted by the mathematical inſtrument makers.

The caſes which have occurred, in our examination of different inſtruments, may be claſſed into ſeven, according to the ſubjoined arrangement, *viz.*

1. When a ſimple motion is produced by means of one wheel and a correſponding pinion.

2. When a ſimple motion is produced by a train of wheels and pinions.

3. When a ſimple motion is produced by the agency of a worm, or endleſs ſcrew, actuating a wheel.

4. When a compound motion is effected partly by the action of wheels and pinions, and partly by a moveable bar or box, which ſupports ſome portion of the mechaniſm.

5. When an *apparent* progreſſive motion is cauſed by the *difference* of two comparative motions.

6. When an *apparent* retrograde motion is cauſed by the *difference* of two comparative motions.

7. And laſtly, when by means of two equal, contrary, or counteracting motions, the parallelism of a wheel's axis is preſerved, as it regards a given original poſition.

Before we treat theſe ſeven caſes ſucceſſively, let it be premiſed, that the wheel or pinion, which actuates or *drives* its fellow, will be invariably called the *driver*, and the other the wheel or pinion *driven*. The different methods of computing the value of any portion of wheelwork will, it is preſumed, require no other mathematical knowledge than an acquaintance with the nature of fractions, vulgar and decimal; which we muſt ſuppoſe to be familiar to every mathematical inſtrument maker.

*Caſe.* 1.—When a ſimple motion is produced by means of one wheel and a correſponding pinion, let the number of teeth, which each contains, be carefully counted and noted down, and alſo which of the two is the *driver:* then, whatever be the aſſumed time of a revolution of the driver, the numbers of the wheel and pinion will conſtitute a ratio, which is a fraction of that time, proper or improper, according as the *driver* is the greater or ſmaller number; which driver muſt be, in all inſtances, the *denominator*. The value of the fraction thus conſtituted, it will be ſuperfluous to ſcientific readers to ſay, is found by multiplying the aſſumed time of a revolution of the firſt mover by the numerator, and dividing by the denominator; the remainders being reduced into their next loweſt denomination of time, after every ſucceſsful diviſion. An example will render this ſimple caſe intelligible by every reader.

Suppoſe that a wheel, conſiſting of 75 teeth, and revolving once in a tropical year, drive a pinion of 6; and that it be required to know in what time the latter revolves, the work at full length will ſtand thus:

D. H. M. S.

365.24222 = 365 5 48 48

6

75)2191.45333(29 Days.

150

691

675

16.45333

24

6581333

32906666

Carry over 75)394.87999(5 Hours.

75)394.87999(5 Hours.
375

19.87999
60

75)1192.79999(15 Minutes.
75

442
375

67.79999
60

75)4067.99999(54.24 Seconds.
375

317
300

17.9
15.0

2g
30

Hence it appears, that $\frac{6}{75}$ths of 365.2422 days is equal to $29^d\ 5^h\ 15^m\ 54^s.24$.

The computation may be sometimes abridged, by converting the vulgar fractions into a decimal, where there is no remainder, and then by multiplying thereby, instead of dividing; thus:

75)6.00(.08
6.00

365.24222
.08

29.2193777 Days.
24

8775111
43875555

5.2650666 Hours.
60

15.9040000 Minutes.
60

54.2400000 Seconds.

Either of these methods may be used with a like result.

If, instead of the wheel, we make the pinion the driver, or denominator of the fraction, the motion of the second mover will then be retarded; for $\frac{75}{6}$ths of 365.24222 days is equal to $4565^d\ 12^h\ 36^m$. This difference in the two revolutions, when the parts of the fraction are reversed, points out the necessity of attending very accurately to the circumstance of the *driver* being made the *denominator* of the *fraction*.

The revolutions of the primary planets in the common planetarium, where there is only one pair of wheels to each planet, are estimated by this case.

When it happens that one of the pair is immoveably fixed, and the other put in motion by being carried round it, whilst their teeth are connected, the fixed wheel is the cause of motion, and is therefore to be called the driver.

But the velocity, or *measure* of motion, in any particular wheel, is not the only effect that is to be attended to in astronomical mechanism, the *direction* of motion is also to be observed, on which account it may be worthy of remark here, that when a wheel or pinion revolves round the *outer* edge of a fixed wheel by means of a moveable bar, it turns in the *same* direction in which the bar itself moves; but when it revolves by means of a connection with the *inner* edge of a fixed ring, it revolves in a *contrary* direction. Also, in a contrate wheel the motion may be either direct or retrograde, accordingly as the teeth are cut in the upper or under face of the wheel; and in bevel wheels it is requisite to notice whether the horizontal wheel be placed above or below the vertical one.

*Case* 2.—When a simple motion is produced by a train of wheels and pinions, the ratio of velocity between the first and last movers is thus ascertained: multiply all the driven pinions or wheels into one another for one numerator, and all the drivers in like manner for one denominator; for instance, suppose that a wheel of 40 drive a pinion of 8, on the arbor of which is a wheel of 42 driving another pinion of 6, and that on the arbor of this last be a third wheel of 56 driving a third pinion of 7; then the operation abridged will stand thus: $\frac{8}{40} \times \frac{6}{42} \times \frac{7}{56} = \frac{336}{94080} = 280$; whence it appears that the number of revolutions gained is 280, which would have been so many lost, had the pinions been the drivers. By this general rule the trains of all the planets in orreries may be computed, however complex, provided the *supporters* of the wheelwork be fixed in a stationary position. After a train is reduced to a simple fraction, the *time* corresponding to it is ascertained exactly as in Case 1. Thus, in the instance before us, if the first wheel of 40 revolve once in a tropical year, the last pinion of 7 will be carried round in $\frac{336}{94080}$ of 365.24222 days, which time is equal to $1^d\ 7^h\ 18^m\ 23^s.3$.

In any train of wheelwork, the wheels or pinions placed on the first, third, fifth, &c. arbors, all revolve in the same direction, and those placed on the second, fourth, sixth, &c. revolve in the contrary direction, whence it sometimes becomes necessary to add an intermediate wheel or pinion, merely to change the *direction* of motion, or otherwise to connect two wheels, which are necessarily placed too far from each other to act immediately together; now, whenever a wheel or pinion of this description is met with, as it gives a tooth for every tooth which it takes, it must be considered as acting in the double capacity of a driver, and a wheel or pinion driven, and will consequently stand both as numerator and denominator of the fractional portion which it represents; but as every fraction which has its numerator and denominator alike, is equal to *unity*, and as unity, taken as a multiplier or divisor, does not alter the value of any multiplicand or dividend, every wheel or pinion acting in a *double capacity*, whatever be its number, may be entirely omitted in computing the value of a train.

*Case* 3.—When a simple motion is produced by the agency of a worm or endless screw actuating a wheel, the structure of the screw must be carefully examined; *i. e.* whether there be one or two threads, and whether the inclination thereof be such as to produce a direct or retrograde motion in the wheel which it impels; these things being noted, the screw must be considered as performing the office of a pinion of one or two leaves, as the case may be, the construction of which is impracticable: the manner of estimating the agency of

of a ſcrew, is, therefore, ſimilar to that of a pinion,—by Caſe 1, if there be only one wheel, but by Caſe 2, if there be a train.

The lunar train of Mr. Ferguſon's orrery, which we ſhall have occaſion to examine under our article ORRERY, affords an example for this caſe, where it will be ſeen that the drivers may be either wheels, pinions, or endleſs ſcrews, provided they are put down as the denominators of their reſpective fractions.

*Caſe* 4.—When a compound motion is effected partly by the action of wheels and pinions, and partly by a moveable bar, which ſupports ſome portion of the mechaniſm, the effect is not ſo eaſily computed as in the foregoing caſes; for beſides the revolutions produced by a train of wheelwork, according to Caſe 2, it will be neceſſary to add or ſubtract an additional calculation, according as the wheels on the moveable bar are circumſtanced with reſpect to thoſe which are not carried thereby: a few inſtances will elucidate this caſe.

In Mr. Ferguſon's orrery, the train of wheels which produce a revolution of Venus, is $\frac{25}{8} \times \frac{69}{7} \times \frac{73}{10} = 224^{d}$ $20^{h}$ $47^{m}$ $1^{s}$, according to the rules laid down in Caſe 2, and Mercury's revolution is occaſioned by $\frac{18}{28}$ of this train placed on the arm of Venus, or is equal to 1.555 revolutions in one of Venus; but the arm of Venus *puſhes* Mercury's laſt wheel once round in the ſame time, by means of a connection with its teeth, as may be ſeen in the author's "Select Mechanical Exerciſes," page 83—85; conſequently $\frac{244.86606}{1 + 1.55555}$, which is equal to $87^{d}$ $23^{h}$ $47^{m}$ $24^{s}$, is the exact length of a revolution of Mercury, as produced by the joint agency of the wheelwork and moveable arm.

For another example, let us ſuppoſe that A be a central wheel of 40, moving, by means of a train, 50 times round in a tropical year, from weſt to eaſt, and B another wheel of 20, carried round it by an arm, whilſt their teeth are connected, in a contrary direction, *viz.* from eaſt to weſt, once in the ſame time; now while the wheel A of 40 revolves 50 times, it is evident that the driven wheel B of 20 muſt revolve 100 times, provided the motion of the arm which ſupports it be out of the queſtion; but if we conſider that the arm and wheel B both revolve in the ſame direction, from eaſt to weſt, it is equally evident that this wheel will revolve *twice* in being carried *round* the wheel A, even though that wheel were at reſt; ſo that 100 + 2 or 102, is the true number of revolutions that the wheel B makes whilſt the arm revolves once.

If, however, we ſuppoſe the ſaid wheel A to revolve from eaſt to weſt, inſtead of from weſt to eaſt, the wheel B will in this predicament turn in a direction contrary to that of the arm, and whilſt it is making 100 revolutions from weſt to eaſt, will make two from eaſt to weſt, the firſt occaſioned by the wheel A only, and the ſecond by the arm carrying it in a contrary direction; ſo that 100 − 2 or 98, will be the number of revolutions effected under theſe circumſtances. In the former inſtance the value will be $\overline{\frac{1}{50} \times \frac{20}{40}} + \frac{40}{20}$ of a year, and in the latter $\overline{\frac{1}{50} \times \frac{20}{40}} - \frac{40}{20}$ of the ſame.

Let us again ſuppoſe B to be 16, and A as before 40, then one inſtance will give $\overline{\frac{1}{50} \times \frac{16}{40}} + \frac{40}{16} = 127\frac{1}{2}$, and the other $\overline{\frac{1}{50} \times \frac{16}{40}} - \frac{40}{16} = 122\frac{1}{2}$.

From theſe examples the reader will be able, it is preſumed, to compute the effect of any wheelwork that may fall under this caſe; but it muſt be recollected, that in every inſtance where a moveable arm carries any wheel round a central one, the central, even though the *driving* wheel, muſt be made the *numerator* of the additive or ſubtractive fraction, which is *annexed* to the calculation depending upon the train, as computed by Caſe 2; otherwiſe an error of conſiderable magnitude will enſue, as will appear when we come to examine, by this caſe, the diurnal motion of ſome of the modern tellurians.

*Caſe* 5.—When an apparent progreſſive motion is cauſed by the difference of two comparative motions, as is that of the moon's apogeal point, compared with the ſmall revolving ecliptic plate in Mr. Ferguſon's inſtruments, called the "Calculator," and the "Mechanical Paradox," ſubtract the number of the ſmaller of the two wheels from that of the greater, and ſee how often the difference is contained in the *greater*: this quotient will expreſs the number of revolutions of the driving wheel during which one apparent progreſſive revolution will be gained by the other.

Let us firſt take $\frac{62}{55}$, the numbers of the calculator, for an example; their difference is 7, and $\frac{62}{7}$ is equal to $8\frac{6}{7}$ years, or 8 tropical years and 313.06476 days: in this example the driving wheel of 55 revolves once in a year, and impels the wheel of 62, which may be called the apogeal wheel, once round in a retrograde direction, except the ſpace of *ſeven* teeth in the ſame time; the ſmall ecliptic plate alſo revolves in a retrograde direction once in a year; conſequently, as the retrogradation of the apogeal wheel is ſlower than that of the ecliptic plate, it *appears* to an obſerver to *advance progreſſively* the ſpace of ſeven ſixty-ſecond parts of a circle in every year, and by this apparent motion indicates the mean motion of the moon's apogee in the ecliptic.

As a ſecond example, let the numbers of the mechanical paradox be taken, which are $\frac{44}{36}$; here the difference is 5, and $\frac{44}{5}$, or $8\frac{4}{5}$, is equal to a period of 8 tropical years and 292.1936 days.

When a train of wheels and pinions is employed to produce the progreſſive motion of the apogeal point, as is done in the common lunarium, it muſt firſt be reduced into a ſimple fraction by Caſe 2, and then eſtimated by this caſe as though one pair of large wheels conſtituted the fraction.

*Caſe* 6.—When an apparent retrograde motion is cauſed by the difference of two comparative motions, as in the caſe of the moon's nodes, compared with the little ecliptic plate in the lunarium, and ſome of the larger orreries, ſubtract, as in the laſt caſe, the ſmaller of the two wheels from the larger, and ſee how often the difference is contained in the *ſmaller*: the quotient will give the number of revolutions in the driving wheel during which one *retrograde* revolution will be effected by the other. Thus, in Mr. Ferguſon's orrery, the

wheels for the moon's nodes are $\frac{56}{59}$, and $\frac{56}{3} = 18\frac{2}{3}$, gives 18 years and 243.49481 days for the period of their retrograde revolution. Alſo, in the mechanical paradox of Mr. Ferguſon, the wheels $\frac{37}{39}$ produce the ſame kind of revolution in $\frac{37}{2}$ or $18\frac{1}{2}$ half years. In this caſe the retrogradation of the driven wheel is quicker than that of the ecliptic plate, on which account the *apparent* motion of the nodes is retrograde, *viz.* the reverſe of the laſt caſe; for there the *loſs* of velocity appears to be *progreſſive motion;* but here the *gain* of velocity conſtitutes the *apparent retrograde* motion; whereas, in point of fact, in both caſes the apparent motion is only the difference of two unequal motions in the ſame direction. A movement of wheels and pinions may here alſo be reduced into a ſimple fraction, and then eſtimated by the preſent caſe.

*Caſe* 7.—The parallelism of a wheel's arbor, which is carried by a moveable arm round a central point, is preſerved by means of *one* revolution of that wheel, in a direction *contrary* to that of the arm, in the *ſame time* that the arm is carried round: for whilſt the progreſſive motion of the arm is carrying any individual point of the wheel towards one ſide of any diſtant object, the retrograde motion of the wheel carries the ſame point juſt as far towards the other ſide of the ſame object, ſo that theſe two contrary motions, like the ſigns of addition and ſubtraction, counteract each other, and there appears to be no revolution at all: thus the ſame point of the wheel, and conſequently the remote end of an arm placed on its revolving arbor, will continue to point towards the ſame diſtant point in every part of its revolution. In order, therefore, to judge of the accuracy of the parallelism of any wheel's arbor, or planet's axis borne by it, in every part of its revolution, it is only neceſſary to examine whether it revolves *exactly once* in each revolution of the arm which ſupports it, in a direction *contrary* to that of the arm; it is of no conſequence, in point of accuracy, by what mechaniſm this effect is produced. It is by a contrivance to effect this purpoſe, that the earth's axis and ſmall ecliptic plate in all the tellurians, lunaria, and orreries are, or ought to be, preſerved parallel to a required original ſituation: but we ſhall have occaſion hereafter to point out a defect in this reſpect in ſome of our modern inſtruments.

The third head that we propoſed to treat of, is to determine by calculation planetary numbers proper for wheelwork, which ſhall produce a given effect. The moſt ſyſtematic way of laying down the various rules for doing this, will be to reverſe the ſeven caſes of which we have ſeen the application; for the fundamental directions for determining the numbers proper for wheelwork to produce a given effect, bear the ſame relation to thoſe laid down under our laſt head, for computing the value of wheelwork already conſtructed, that analyſis does to ſyntheſis; the reader, therefore, muſt bear in mind, that in thoſe caſes where multiplication or addition were uſed there, diviſion or ſubtraction will be neceſſary here; and to prepare him gradually for entering upon the more difficult calculations where prime numbers occur, we ſhall ſelect ſuch examples only in the exemplification of theſe ſeven reverſed caſes as admit of commenſurable fractions.

*Caſe* 1.—When a pinion is required to revolve any given number of times for its wheel once, as ſuppoſe 10, it is only neceſſary to fix upon a ſuitable number for the pinion, and multiply the given number of revolutions thereby to aſcertain the number of teeth for the required wheel; thus, if the pinion choſen be 9, the wheel muſt be $9 \times 10 = 90$, ſo that $\frac{9}{90}$ will be the pair required to produce an increaſe of velocity in the ratio of 10 to 1; but if a decreaſe be required, then $\frac{90}{9}$ will be the proper pair.

When the number of revolutions conſiſts of an integer and a fractional part, or what is uſually called "a mixed number," as is generally the caſe, it muſt be reduced to a ſimple fraction, which will expreſs the ratio of the wheel and its proper pinion: for inſtance, if $6\frac{3}{4}$ revolutions were required to be effected in a given time, the ſimple fraction or ratio would be $\frac{27}{4}$, or rather $\frac{4}{27}$, as there is to be an increaſe of velocity, and as the denominator is to be made the driver; here, however, the 4 is too ſmall a number to conſtitute a good pinion; let, therefore, both parts of the fraction be augmented in the ſame proportion, till they are both of a convenient practical ſize; in this inſtance, for moſt common purpoſes, the numerator and denominator may be both *doubled*, by which means $\frac{8}{54}$ will be the wheel and pinion required.

This rule is not only eaſy to be underſtood by any perſon who underſtands the nature of vulgar fractions, but its application is general in all kinds of ſimple wheelwork which are placed in ſtationary poſitions. Had the tropical revolutions of the planets been given in books on aſtronomy in exact fractions of a ſolar year, or of any other definite period, theſe directions would have been ſufficient for determining the wheelwork which falls under this caſe; but the periods are generally given in days, hours, minutes, and ſeconds, on which account it is neceſſary to reduce each period into its loweſt denomination, and alſo the period, with which each is compared, into the ſame, and then reduce this large fraction into its loweſt terms, by a continual alternate diviſion, till there is no remainder, as directed in the common ſchool books of arithmetic; then the fraction in its loweſt terms will be the ratio for which the wheel and pinion are to be determined.

For the ſake of exemplification, let us ſuppoſe that the tropical period of any heavenly body revolving round the ſun, be $243^d\ 11^h\ 52^m\ 32^s$, and that a pair of wheels be required to produce this revolution, whilſt the driver revolves in $365^d\ 5^h\ 48^m\ 48^s$: theſe periods, reduced into a ſimple fraction, will be $\frac{21037952''}{31556928}$, which, in its loweſt terms, is $\frac{2}{3}$; therefore, increaſing both parts eight, nine, or ten times, we ſhall have $\frac{16}{24}$, $\frac{18}{27}$, or $\frac{20}{30}$, for the wheels required. In every inſtance where a ſolar year is the denominator, the ratio of an inferior planet will be a *proper*, and of a ſuperior one an *improper* fraction.

*Caſe* 2.—Whenever two periods which are compared together conſtitute a fraction, which, in its loweſt terms, is compoſed of numbers too large for ſingle wheels, a train of wheels and pinions becomes neceſſary to reduce the ſize of the ſimple wheels, which may be done thus; find, by a repetition of aſſumed diviſors, or from a table for this purpoſe, what two or more numbers, uſually called compoſite numbers or factors, multiplied into each other, will give

give a product equal to the numerator, and ſubſtitute thoſe numbers, with the ſign of multiplication between each, for the numerator itſelf; do alſo the ſame for the denominator; and theſe will be the proper numbers to be tranſpoſed, augmented, or diminiſhed, as circumſtances may require, for a train of the ſame value as the original ſimple fraction. An inſtance or two will render this caſe familiar: let us take $\frac{629}{21}$ as the ratio of a ſuperior planet compared with the earth, the numerator of which is too large for a ſingle wheel: now the two compoſite numbers for the numerator are 37 and 17, their product being equal to 629, and the two compoſite numbers for 21 are 7 and 3; hence, inſtead of $\frac{629}{21}$, we have obtained $\frac{37 \times 17}{7 \times 3}$, or, which is the ſame thing in the form of a train, $\frac{37}{7} \times \frac{17}{3}$, or otherwiſe $\frac{37}{3} \times \frac{17}{7}$, it being a matter of no conſequence how the pinions are placed with reſpect to the wheels, provided they be both drivers: let now both parts of the $\frac{17}{3}$ be doubled, ſince 3 cannot be made into a good pinion, and the requiſite train will be $\frac{37}{7} \times \frac{34}{6}$.

Again, let us take $\frac{35}{621}$ for the ratio of an inferior planet; the compoſite numbers will be reſpectively $7 \times 5$, and $27 \times 23$, conſtituting a train of $\frac{7}{27} \times \frac{5}{23}$, or $\frac{14}{54} \times \frac{10}{46}$, if they have all their parts doubled. By this contrivance two ſmall wheels with correſponding pinions anſwer the ſame purpoſe as one very large wheel and its pinion, and are not only much more eaſily made, but rendered more portable for the conſtruction of an inſtrument.

When it happens that there is a great diſparity between the numerator and denominator of a fraction, where only the larger of them admits of compoſite numbers, we muſt ſubſtitute *unity* for a compoſite number along with the other, and then increaſe both parts to get a train as before. As an example of this kind, let us take $\frac{19}{235}$, the lunar numbers of Ferguſon's calculator, which, though more accurate than thoſe of his orrery, he has not attempted to reduce into ſmaller practical numbers: the numerator is a prime number, for which we may put $19 \times 1$, and the denominator is equal to $47 \times 5$; hence $\frac{19 \times 1}{47 \times 5}$, or $\frac{19}{47} \times \frac{1}{5}$, will give us a train of $\frac{19}{47} \times \frac{10}{50}$, equal in value to $\frac{19}{235}$.

In order to produce the greateſt poſſible velocity with the feweſt teeth in a train, the ratio of each wheel to its pinion ought to be, ſays Dr. T. Young, in his Syllabus, nearly as 36 to 10.

*Caſe* 3.—In every inſtance where 1 or 2 ſtands in the place of a pinion, according to either Caſe 1, or Caſe 2, a ſingle or double ſcrew may be adopted inſtead of increaſing both parts of the ratio, as has juſt been directed; but it muſt be under this limitation, that the ſcrew be always the driver, otherwiſe the friction and indirect action of the teeth upon its thread will prevent the communication of motion.

*Caſe* 4.—This caſe is more intricate than the preceding ones, and ſeems not to have been underſtood by any contriver of an orrery, except perhaps Ferguſon and Janvier, whoſe orreries are free from both the defect and exceſs in the diurnal motion, which, one or other of them, render the tellurian and large orreries extremely imperfect.

When any given number of revolutions is to be produced in a wheel or pinion carried by a moveable arm or bar, during the time that the arm itſelf is carried once round a central driving wheel, a fraction conſiſting of the numbers of thoſe two wheels, (whereof the central one muſt be the numerator, and the one driven by it on the bar the denominator,) muſt be added to, or ſubtracted from, the required number of revolutions, accordingly as the arm and the wheel borne by it have the directions of their motions circumſtanced, and wheelwork muſt be calculated to effect the ſum or difference, as the caſe may be: if the motions of the arm and of the wheel borne by it be in the *ſame* direction, the fraction muſt be *ſubtracted*, but if they be in *contrary* directions, the ſame muſt be *added*, before the proper wheels are calculated for the number thus obtained. As an inſtance of this ſpecies of calculation, let any central wheel be ſuppoſed to have 15 teeth, and the wheel borne by an arm moveable about it to have 10, and let us ſuppoſe that this latter wheel and the arm that ſupports it move in the *ſame* direction; then, under theſe circumſtances, let two ſuch other wheels be required to be calculated to actuate the central wheel, for the former portion of the train, as, in addition to thoſe two, will produce juſt 15 revolutions of the laſt wheel 10, whilſt the arm is going once round: in the firſt place, becauſe the arm and the wheel 10 move both in the *ſame* direction, $\frac{15}{10}$, or $1\frac{1}{2}$, muſt be *ſubtracted* from 15, the number of revolutions required, which ſubtraction leaves $13\frac{1}{2}$; in the next place, becauſe the central wheel of 15 goes only twice round for the wheel of 10, which is driven by it three times, $\frac{2}{3}$ or $\frac{10}{15}$ of $13\frac{1}{2}$, which is equal 9, is the value to be expreſſed by the fraction which is to repreſent the wheel and pinion required; $\frac{12}{108}$ therefore, or any pair in a ſimilar ratio, will be the wheel and pinion required; and the whole value, eſtimated by Caſe 4 under our laſt head, will be thus expreſſed, $\overline{\frac{12}{108} \times \frac{10}{15}} + \frac{15}{10} = 15$.

Again, let two ſuch wheels be required as will produce the ſame number of revolutions while the arm and the wheel borne by it move in *contrary* directions, the numbers of the two given wheels remaining the ſame as before. Here $\frac{15}{10}$, or $1\frac{1}{2}$, muſt be *added* to 15, which ſum will be $16\frac{1}{2}$; then $\frac{10}{15}$ or $\frac{2}{3}$ of $16\frac{1}{2}$ is 11, the value to be expreſſed by the required wheels, which therefore may be $\frac{12}{132}$, producing two more revolutions of the central wheel than was produced in the other inſtance; here the computation of the whole value will be $\overline{\frac{12}{132} \times \frac{10}{15}} - \frac{15}{10} = 15$.

Hence it appears, as was intimated before, that when a negative

negative ſign is prefixed to the fractional portion, which conſiſts of the central wheel for a numerator and the wheel on the arm for a denominator, in computing the number of revolutions made by the latter in wheelwork already conſtructed, according to Caſe 4 of our laſt head, a poſitive ſign muſt be here uſed in calculating what the wheelwork ought to be, and *vice verſâ*; for as $4 + 2 = 6$, ſo $6 - 2 = 4$, the one caſe being juſt the converſe of the other. Alſo, whenever the two wheels, which compoſe the fraction juſt ſpecified, are of equal numbers, *unity* muſt invariably be added or ſubtracted, accordingly as the arm and wheel borne by it are circumſtanced with reſpect to the direction of their motions.

*Caſe* 5.—When an apparent progreſſive motion is to be produced by the difference of two comparative motions in wheelwork, reduce the given period into its loweſt denomination of time, and put it into a ſimple fraction in its loweſt terms, which, if the motion is to be ſlower than the period of which it is a fraction, will be an improper fraction: then let the numerator be the *driven* wheel, and the *difference* between the numerator and denominator the *driver;* for inſtance, if $9\frac{5}{6}$ years were the period in which an index is required to advance progreſſively round the little ecliptic of an orrery or tellurian, whilſt the ecliptic itſelf is moving backward once in a year to preſerve its parallelism; in the firſt place $9\frac{5}{6}$, reduced into a ſimple fraction, gives $\frac{59}{6}$, which would be the proper wheels, by Caſe 1, if the graduated ecliptic were not placed on a revolving arbor, but in this caſe $\frac{59}{59-6}$, or $\frac{59}{53}$, will be the wheels required.

If it ſhould ſo happen that a pair of wheels thus acquired ſhould be too large to be conveniently conſtructed, they may be converted into a train of the ſame value by the directions laid down in the ſecond caſe of this head.

*Caſe* 6.—When we are to exhibit an apparent retrograde motion by the difference of two unequal motions, in a given period, let this period be reduced into a ſimple improper fraction, as in the laſt caſe, and then the numerator, as before, will be the *driven* wheel; but here the *ſum* of the numerator and denominator will be the *driver*, ſo that if $9\frac{5}{6}$ were the period as before, the wheels would be equal to $\frac{59}{59+6}$, namely $\frac{59}{65}$. In this caſe alſo a train may be conſtituted of two wheels which are in themſelves too large for uſe.

*Caſe* 7.—When the parallelism of a wheel's axis is to be preſerved in every part of the revolution of the arm that bears it, nothing more is neceſſary than to make the wheel revolve by any contrivance *exactly once* in each revolution of the arm, but in a *contrary* direction, as has been already explained in Caſe 7 of our laſt head.

It may here be acceptable to the inſtrument maker to learn how, from one or other of theſe ſeven caſes, any wheel or portion of a train, which has been miſlaid or loſt, may be replaced.

As it is always known what period of time is *intended* to be repreſented by any particular train in every inſtrument, the general rule will be, to aſcertain, firſt by the proper caſe in our laſt head, what the value is, in time, of that portion of the train which remains, and then divide the whole known period by this value, and the quotient will repreſent the value of the deficient portion to be replaced by the correſponding caſe in this head.

For an example of this kind we may take the annual train of the old aſtronomical clock at Hampton Court, in the calliper of which we have ſeen that two deficient wheels are repreſented by dotted circles, which are ſaid to have been ſomehow ſupplied by a man of the name of Lang. Bradley of Fenchurch-ſtreet, but in what manner is not related: in our notice of this clock we put down the whole train thus, $\frac{*}{8} \times \frac{29}{*} \times \frac{132}{12}$, out of which we may take $\frac{29}{8} \times \frac{132}{12} = \frac{3828}{96}$, or 39.875 for the value in days of the entire portion; and if the whole year 365.24222 be divided by 39.875, the quotient 9.15943 will expreſs the value of the two deficient wheels, or wheel and pinion, which we now have to aſcertain. We find, by either of two modes of calculation, which will be preſently deſcribed and illuſtrated, that the value of the decimal portion, 15943, if expreſſed in vulgar fractions, will be, according to the accuracy we may require, ſome one of theſe, *viz.* $\frac{1}{6}$, $\frac{3}{19}$, $\frac{4}{25}$, or $\frac{11}{69}$; and the mixed numbers $9\frac{1}{6}$, $9\frac{3}{19}$, $9\frac{4}{25}$, and $9\frac{11}{69}$, when converted into ſimple ratios, will be reſpectively $\frac{55}{6}$, $\frac{174}{19}$, $\frac{229}{25}$, and $\frac{632}{11}$; the moſt accurate of theſe of courſe is the laſt, but is by no means of a practical ſize; in the calliper it appears that the wheel is a little larger than the one marked 132, which circumſtance points out that $\frac{174}{19}$ muſt be the numbers to be adopted in order to ſupply the deficiency of the train before us: the whole train, however, is by no means ſo accurate as Ferguſon's, who adopted for this conſtruction of a clock the ſame train which he calculated for his orrery: according to Caſe 2 of our ſecond head, the value of the whole train, thus ſupplied, will be $\frac{174}{8} \times \frac{29}{19} \times \frac{132}{12} = \frac{666072}{1824} = 365^{d}\ 4^{h}\ 6^{m}\ 35^{s}.184$; and if a more exact period be required to be repreſented, either one of the larger pairs muſt be uſed, or the whole train muſt be reformed.

If, however, we take 365 days for the year, which probably was the time intended, then we ſhall have as ſucceſſive fractions $\frac{55}{6}$, $\frac{64}{7}$, $\frac{119}{13}$, and $\frac{2920}{319}$, the laſt of which is the exact fraction, but too large for wheelwork, on which account, moſt likely, $\frac{119}{13}$ were the numbers, which makes the whole movement $\frac{119}{8} \times \frac{29}{13} \times \frac{132}{12} = 365^{d}\ 0^{h}\ 13^{m}\ 50^{s}.7$.

By this method alſo a ratio may be formed of the periods of any two individual planets, and wheelwork calculated to communicate motion immediately from one to the other; or indeed *any time* may be aſſumed as the period of the *firſt mover* in an inſtrument, provided the wheelwork of all the planets are proper ratios of that period: in the common planetarium the period aſſumed is one year, but if, inſtead of this, a period which is nearly a mean between the two extreme periods of Mercury and Georgian, were ſubſtituted, then eleven pair of wheels, or wheels and pinions for the eleven primary planets, would be ſufficient for the production

tion of the eleven periods, more or leſs accurate, accordingly as the ratios conſiſt of large or ſmall numbers.

We ſhall hereafter ſhew how a mean period may be aſcertained which will become a common denominator to the tropical periods of *all* the planets, uſed as numerators in *practical* numbers; and at the ſame time the moſt deſirable numbers will be determined, for the conſtruction of a ſimple planetarium, to repreſent all the mean motions accurately with the leaſt poſſible number of wheels and pinions; but in order to arrive at great accuracy in all the periods, the numbers that compoſe the fractions will neceſſarily be large; for what is gained in ſimplicity, will, in a certain degree, be loſt in accuracy.

*Of incommenſurable Numbers.*—We have now explained the fundamental rules for determining wheelwork which ſhall correſpond to any aſſumed *commenſurable* period, the application of which can hardly be miſapplied in the reſpective caſes which occur in the practice of inſtrument makers; but when we come to apply them to ratios conſiſting of *prime* or *incommenſurable* numbers, it becomes inevitably neceſſary to ſubſtitute other ratios of *nearly* the *ſame value*, for the true ratios themſelves, and then to apply the preceding rules to thoſe, which muſt conſequently be *commenſurable* ratios.

The readieſt method of determining all the variety of approximate *ſmall* ratios, though ſomewhat mechanical, is by means of two logarithmic lines for working proportions, which on the common ſliding rules are marked A and B; for if the three firſt figures in the numerator of any fraction, vulgar or decimal, which conſiſts of many places of figures on A, be ſet to the three firſt of its denominator on B, then every pair of coincident dividing or ſubdividing lines, examined like the index and limb of a Hadley's ſextant, will conſtitute ſo many ratios, more or leſs exact, as the coincidences are more or leſs perfect; and if the graduated lines are of a large radius, and well graduated upon metal or ſeaſoned wood, all the variety of approximate ſmall ratios will be ſeen at one poſition of the ſlider, that can poſſibly be formed; after which their reſpective values may be aſcertained, by converting them ſucceſſively into decimals, and comparing them with the large original fraction.

This ſhort method, however, ought not to be depended upon in calculations where great accuracy is required, for we can ſeldom come nearer the truth, in the fraction of a year, than as far as the ſecond figure in decimals; whereas, the value of *ſeconds* depends generally upon the *fifth* and *ſixth* decimal figures. In the fraction of a day or other ſhort period, it is very uſeful as a check upon arithmetical calculations, and will ſometimes even ſuperſede the neceſſity of them. We might now proceed to determine, by a direct method, better known to mathematicians than artiſts, a ſeries of continual fractions, which approximate to the truth the nearer the higher they run, and are alternately *above* and *below* the true ratio; but as a *new tentative* or *indirect method* occurred to the author of this article, which has its advantages, before he was acquainted with the application of the one alluded to, it may be deemed acceptable to ſome readers to ſee it exemplified in the firſt place.

*Indirect Method of Approximation.*—When none of the ſmall fractions or ratios indicated by the ſliding rule are ſufficiently accurate, take one of them and increaſe both parts of it, by a common multiplier, and then *add unity* to, or *ſubtract unity* from that part, whether numerator or denominator, which is too great or too ſmall for its correſpondent, and by trying the value of the new enlarged fraction in decimals, it will be readily ſeen whether the multiplier aſſumed has been too large or too ſmall; after which a ſecond, and a third multiplier may be ſucceſſively tried, and it will ſoon appear what number is the moſt accurate multiplier to be adopted. The advantages of this method are theſe two principally; that its nature is eaſy to be apprehended without algebraical demonſtration; and that it affords a great variety of ratios, differing from each other but little in value, out of which to ſelect a proper practical or commenſurable ratio; indeed inſtances have occurred, in which better practical trains have been procured by this method, than can be done by the more direct ſcientific method, which will be afterwards exemplified.

*The Sun's Wheels.*—As the ſun is the grand luminary which, placed in, or at leaſt near, the centre of the whole ſyſtem, gives light and heat to the ſurrounding bodies, we will begin with the calculation of wheels proper for producing a rotation on his axis, and then proceed gradually to the revolutions of the planets in their reſpective order; the period of a rotation of the ſun, as it reſpects the earth, has been given by La Lande, as we have ſeen above, at 25 days and 10 hours, or 25.41666 days, by which, if we divide 365.24222, we ſhall have 14.37008 rotations in a tropical year; here $14\frac{37}{100} = \frac{1437}{100}$ is not to be divided lower than $\frac{479 \times 3}{10 \times 10}$, on which account an approximate fraction muſt be ſubſtituted for $\frac{37}{100}$; ſet, therefore, 37 on A to 100 on B, and the neareſt ſmall ratios conſtituted by the apparently coincident lines will be $\frac{7}{19}$ and $\frac{10}{27}$, the latter of which, converted into a decimal, makes .370370, &c. in which the variation from the truth is, as it happens, in the *fourth* figure of decimals. In this inſtance, as the ſolar ſpots ſeldom continue unchanged for more than two or three rotations of the ſun, a more accurate ratio might ſeem quite unneceſſary, for $14\frac{10}{27} = \frac{388}{27}$, or rather $\frac{27}{388}$, as the motion to be produced is quick, is reducible into $\frac{27 \times 1}{97 \times 4}$, and a train equal to this is $\frac{27}{97} \times \frac{15}{60} = 25^d\ 9^h\ 59^m\ 31^s$; but to exemplify our method of approximating ſtill nearer to the truth, let us take the $\frac{7}{19}$, and multiply both its parts by 10, making $\frac{70}{190}$; now as $\frac{7}{19}$ is equal to .36842 only, the 19 is too large for its numerator; let, therefore, unity be ſubtracted from 190, and we ſhall have $\frac{70}{189} = .370370$, &c. the ſame ratio as $\frac{10}{27}$; again, try 12 for a multiplier, and there will be $\left.\frac{12 \times 7}{12 \times 19 - 1}\right\} = \frac{84}{227} = .37004$, which is extremely near the truth, but unfortunately $14\frac{84}{227}$ cannot be turned into a convenient train, by reaſon of 227 being a prime number; from theſe two trials, one of which gives more, and the other leſs than the true value, we now know, that if 11, uſed as a multiplier, will produce a commenſurable ratio, it will be proper for our train; and if not, we muſt take 13, as the next neareſt to 12, for the proper multiplier; accordingly

ingly $\frac{11 \times 7}{11 \times 19 - 1} = \frac{77}{208} = .37019$ gives us $14\frac{77}{208} = \frac{2989}{208}$, and when this is inverted, we ſhall have a train of $\frac{49}{16} \times \frac{61}{13} = 25^d\ 9^h\ 59^m\ 56^s.995$, in which time the error is little more than three ſeconds. If it had become neceſſary to uſe 13 as a multiplier inſtead of 11, the proceſs would have been $\left.\frac{13 \times 7}{13 \times 19 - 1}\right\} = \frac{91}{246} = .36992$ nearly; and $14\frac{91}{246} = \frac{91}{3535}$, when inverted, will afford the train $\frac{6}{101} \times \frac{41}{35}$, the value of which is $25^d\ 10^h\ 0^m\ 4^s$, in which the error is only four ſeconds in the oppoſite extreme.

In determining what high numbers are commenſurable, when a table of primes is not at hand, try firſt 2 and 5 as diviſors, and then the primes 3, 7, 11, 13, 17, 19, 23, &c. ſucceſſively, if they are indiviſible by 2 or 5, until a prime number is arrived at as large as the ſquare root of the number examined, and if none of theſe will divide it without a remainder, the high number is itſelf a prime number, and therefore inapplicable to mechanical purpoſes.

*Wheels for the tropical Revolution of Mercury.*—After having given a detailed account of the application of our indirect method of approximation, in determining a train for the ſun's rotation, it will be unneceſſary to be ſo minute in particularizing the whole proceſs in the examples which follow.

The tropical period of Mercury, as we have ſeen, is $87^d\ 23^h\ 14^m\ 35^s.2$, or makes 4.151967, &c. revolutions in a tropical year. Now if 152 on A be put to 1000 on B, on the ſliding rule, we ſhall have the ratios $\frac{5}{33} = 1515$, $\frac{7}{46} = 1521$, &c. and $\frac{12}{79} = 1519$, as nearly as poſſible. The laſt of theſe three ratios is capable of forming a train equal to $\frac{79}{328}$, namely, $\frac{12}{96} \times \frac{79}{41} \left(= \frac{79}{8 \times 41}\right)$, which produces an error of only $2^m\ 6^s$ too much in a revolution. But exact as this train is, compared with the trains of inſtruments in general, our method of approximation will procure us a much more accurate one. Let us take the firſt ratio, $\frac{5}{33}$, for this purpoſe: the wheels compoſed of $4\frac{5}{33}$ are $\frac{33}{137}$; and as 33 is too large for the 5, unity muſt be added to the 137. After both parts are multiplied an equal number of times, this multiplier we find by a few trials to be 67; ſo that $\frac{33 \times 67}{137 \times 67 + 1} = \frac{2211}{9180} = 4.15196$ &c. gives us a very convenient train of $\frac{11}{90} \times \frac{67}{34} \left(= \frac{33 \times 67}{102 \times 90}\right)$, the value of which is $87^d\ 23^h\ 14^m\ 35^s.796$, in which the error in a whole revolution is little more than *half a ſecond.*

*Wheels for the tropical Revolution of Venus.*—The tropical revolution of Venus has been aſcertained to be $224^d\ 16^h\ 41^m\ 30^s$; according to which data, this planet will make 1.625498, &c. revolutions in a ſolar year. Now the neareſt ſmall fraction, which correſponds to the decimal portion, is $\frac{5}{8} = 625$ exactly, and the ratio $\frac{8}{13} = 1\frac{5}{8}$ inverted, is the ſame ratio which was uſed for Venus in Huygens' automaton, and the inſtruments copied from it. But theſe numbers are by no means ſufficiently correct for an inſtrument of great accuracy; they muſt conſequently be brought, by our approximating proceſs, into higher numbers ſuitable for a train. The numerator of this fraction being too large for its denominator, let us aſſume 312 for a multiplier, and add unity to the denominator; for the more accurate the ſmall fraction is already, the greater will the multiplier be required to be, and *vice verſâ*: thus we ſhall have $\frac{8 \times 312}{13 \times 312 + 1} = \frac{2496}{4057} = 1.6254006$. Again, this multiplier proving to be too great, let us try 305 inſtead, from which we ſhall have $\frac{8 \times 312}{13 \times 1312 + 1} = \frac{2440}{3966} = 1.625409$, &c. which is a little nearer. The former of theſe periods is equal to $224^d\ 17^h\ 1^m\ 0^s$, and the latter to $224^d\ 16^h\ 59^m\ 10\frac{1}{2}^s$: now the difference of thoſe two periods being about $2^m$, and the difference of the multipliers 7, we can, from theſe two trials, aſcertain pretty nearly what number will be a proper multiplier; for as $2^m$ are to 7, the difference of the multipliers, ſo are $17^m$, the whole remaining error, to 59, the number to be ſubtracted from 305, upon a preſumption that the decreaſing intervals of time are in direct proportion; 246, therefore, is the multiplier for our third trial, from which we gain a period, where the error is much leſs, and of an oppoſite denomination. In order now to gain a great variety, from which to ſelect an accurate practical train, we will ſubjoin a table of ratios, with their values attached, till we arrive at the truth as nearly as may be.

TABLE of Ratios for the Train of Venus.

| Proceſs. | Ratios. | Values. |
|---|---|---|
| $\left.\frac{8 \times 246}{13 \times 246 + 1}\right\}$ | $= \frac{1968}{3199}$ | $= 1.625508.$ |
| $\left.\frac{8 \times 247}{13 \times 247 + 1}\right\}$ | $= \frac{1976}{3212}$ | $= 1.625506.$ |
| $\left.\frac{8 \times 248}{13 \times 248 + 1}\right\}$ | $= \frac{1984}{3225}$ | $= 1.625504.$ |
| $\left.\frac{8 \times 249}{13 \times 249 + 1}\right\}$ | $= \frac{1992}{3238}$ | $= 1.625502.$ |
| $\left.\frac{8 \times 250}{13 \times 250 + 1}\right\}$ | $= \frac{2000}{3251}$ | $= 1.625500.$ |
| $\left.\frac{8 \times 251}{13 \times 251 + 1}\right\}$ | $= \frac{2008}{3264}$ | $= 1.625498.$ |
| $\left.\frac{8 \times 252}{13 \times 252 + 1}\right\}$ | $= \frac{2016}{3277}$ | $= 1.625496.$ |
| $\left.\frac{8 \times 253}{13 \times 253 + 1}\right\}$ | $= \frac{2024}{3290}$ | $= 1.625494.$ |

| Proceſs. | Ratios. | Values. |
|---|---|---|
| $\left.\frac{8\times 254}{13\times 254+1}\right\}$ | $=\frac{2032}{3303}$ | $=1.625492.$ |
| $\left.\frac{8\times 255}{13\times 255+1}\right\}$ | $=\frac{2040}{3316}$ | $=1.625490.$ |
| $\left.\frac{8\times 256}{13\times 256+1}\right\}$ | $=\frac{2048}{3329}$ | $=1.625488.$ |
| $\left.\frac{8\times 257}{13\times 257+1}\right\}$ | $=\frac{2056}{3342}$ | $=1.625486.$ |
| $\left.\frac{8\times 258}{13\times 258+1}\right\}$ | $=\frac{2064}{3355}$ | $=1.625484.$ |

In this table, each ratio differs in value from the next preceding, on an average, about 24″ of time, and $\frac{2008}{3264}$ is the moſt exact, the error in it being ſcarcely perceptible: it is not, however, reducible into the form of a practical train; but $\frac{2016}{3277}$, the next in accuracy, which varies from the truth only 2 in the *ſixth* place of decimals, is convertible into the train $\frac{32}{113}\times\frac{63}{29}$, the value of which is $224^{d}\ 16^{h}\ 43^{m}\ 1^{s}$.

Beſides this train, the ratio $\frac{1984}{3225}$ affords the train $\frac{32}{75}\times\frac{62}{43}=224^{d}\ 16^{h}\ 40^{m}\ 25^{s}$; and the ratio $\frac{2064}{4355}$, which is the leaſt exact, is convertible into $\frac{48}{55}\times\frac{43}{61}=224^{d}\ 16^{h}\ 44^{m}\ 18^{s}$, in which the error is only $2^{m}\ 48^{s}$ in the whole period. Indeed, many other ratios might be procured by this proceſs, varying only a few minutes from the truth, if the table were extended; but as the moſt accurate will always be preferred, we have carried it to a ſufficient length.

The trains, which have been aſcertained from the preceding table, are calculated upon a ſuppoſition that the wheels will all be placed on a ſtationary ſupport; but as Venus revolves next to the Earth, in the ſolar ſyſtem, the writer of this article has found it convenient, in an orrery which he has conſtructed, to place ſome of the wheels on the Earth's annual arm; in which conſtruction, Venus is carried *once* round in every tropical year, independently of the ſimple operation of the train, in the ſame way that Mercury is carried once by the arm of Venus, in Ferguſon's orrery, in every revolution of the latter. This mode of placing the wheels requires that the numerator of the ſimple fraction, $\frac{2016}{3277}$, already adopted as the moſt accurate, ſhould remain as it is; but that the difference between the numerator and denominator be made a new denominator, by which means *unity* is ejected, and $1+\frac{2016}{1261}$, inſtead of $1\frac{2016}{1261}$, becomes the repreſentative formula, and the value of the train $=0.625496$; $\frac{2016}{1261}$, however, is capable of forming the train $\frac{63}{13}\times\frac{32}{97}$, and $1+\overline{\frac{63}{13}\times\frac{32}{97}}$ is equal to $214^{d}\ 16^{h}\ 42^{m}\ 1^{s}$, as before.

The ratio $\frac{2016}{1261}$ might otherwiſe have been acquired by taking $\frac{8}{5}=625$, inſtead of $\frac{8}{13}$, or $\frac{13}{8}=1.625$, before the approximation; for $\left.\frac{8\times 252}{5\times 252+1}\right\}=\frac{2016}{1261}$ is the ſame reſult as by the former proceſs. For other calculations of this ſort, ſee PLANETARIUM.

*Train for the Earth's annual and diurnal Motions.*—The earth's diurnal rotation and annual revolution, taken jointly, conſtitute the ſtandard of our meaſure of time, and is always referred to, not only when we ſpeak of hiſtorical facts, but when we deſcribe the revolutions and rotations of all the other planets; it is therefore of the utmoſt importance, in an aſtronomical inſtrument, that the train, which conſiſts of the ratio between a day and a year, be accurate. The ſolar year, as we have ſeen, conſiſts of $365^{d}\ 5^{h}\ 48^{m}\ 48^{s}$, or, in another form, of 365.24222 days; the neareſt fraction to repreſent the decimal portion 24222 exactly, is $\frac{109}{450}$, and $365\frac{109}{450}=\frac{164359}{450}$ are diviſible into $\frac{269}{10}\times\frac{47}{9}\times\frac{13}{5}$, which numbers conſtitute a movement for the *truth itſelf*. If, however, we wiſh to ſubſtitute an approximate ratio of as nearly an equal value as we can obtain for ſmaller numbers than 269; the ſmall fraction ſuitable to approximate from is $\frac{8}{33}=2424$, and the neareſt multiplier is 35; for 365 $\left.\frac{8\times 35}{33\times 35\times 1}\right\}=\frac{1156}{422220}$ is reducible into $\frac{4}{227}\times\frac{17}{60}\times\frac{17}{31}$, the time correſponding to which is $365^{d}\ 5^{h}\ 48^{m}\ 47^{s}.3$, which will be allowed to be exact enough for the niceſt purpoſes, as the error in a year does not amount to three quarters of a ſecond.

The numerator 4, it will be obſerved, is too ſmall a number for a pinion to conſiſt of, for which reaſon let it be doubled, and alſo the 31 among the denominators or drivers, by which alteration we ſhall have a practical train of $\frac{8}{227}\times\frac{17}{62}\times\frac{17}{60}$. Here the large wheel of 227 will be ſuitable for the fixed wheel in an orrery or tellurian, where the reſt of the train is placed on the annual arm, and carried round it; or for what is called the annual wheel in any orrery where all the wheels revolve in fixed ſituations.

*Wheels for the tropical Revolution of Mars.*—Next in the ſyſtem beyond our earth revolves the planet Mars, finiſhing its courſe through the ecliptic in $686^{d}\ 22^{h}\ 18^{m}\ 37^{s}$, according to our calculations from La Lande's laſt tables, which time bears the ſame proportion to a ſolar year that 1.880750 does to 1. In this example the ſmall fraction will be $\frac{47}{25}=1.88$, and 53 the neareſt multiplier, as may be ſeen from the ſubjoined table.

TABLE of the Ratios of Mars.

| Proceſs. | Ratios. | Values. |
|---|---|---|
| $\frac{47 \times 52 + 1}{25 \times 52}$ | $= \frac{2445}{1300}$ | $= 1.880769$ |
| $\frac{47 \times 53 + 1}{25 \times 52}$ | $= \frac{2492}{1325}$ | $= 1.880754$ |
| $\frac{47 \times 54 + 1}{25 \times 54}$ | $= \frac{2539}{1350}$ | $= 1.880740$ |

Fortunately $\frac{2492}{1325}$, the moſt accurate of theſe three ratios, admits of the practical train $\frac{89}{25} \times \frac{28}{53} = 686^{d}\ 22^{h}\ 20^{m}\ 41^{s}.19$; in this train the error is $2^{m}\ 41^{s}.19$, or a ſpace in the ecliptic of $3\frac{1}{2}''$, which may be conſidered nearly as accurate at any of the preceding; for during a revolution of Mercury it will only be about an eighth part of this quantity; an error of a few minutes in the revolutions of the ſuperior planets being leſs perceptible than in the inferior ones, both on account of the ſlowneſs of their mean motions, and the great length of their tropical periods; for one minute's motion of Mercury in the ecliptic is $10''.2$, which exactly correſponds to *two hours* motion of Saturn, and $5^{h}.69$ of the Georgian planet.

*Wheels for the tropical Revolutions of the four little Planets lately diſcovered.*—According to the beſt information we at preſent poſſeſs, the periods of the four newly diſcovered planets, as they relate to the ecliptic, are theſe; *viz.* that of Veſta in 3.655153 tropical years, that of Juno in 4.355282, that of Ceres in 4.603056, and that of Pallas in 4.603616; but thoſe of the two laſt named are ſo nearly alike, that a mean between the two may be taken at 4.603386, in order to make one pair of wheels, or one train, produce the revolutions of both planets.—By the aid of the ſliding rule we find the neareſt ſmall fraction for Veſta to be $\frac{19}{29} = .65517$; and $3\frac{19}{29} = \frac{106}{29}$ will conſtitute the wheels proper to produce a revolution in 3.65517 tropical years, or in 1335.02329 days. In like manner for Juno the ſmalleſt fraction is $\frac{11}{31} = .35484$; and $4\frac{11}{31} = \frac{135}{31}$ will be proper wheels for a revolution to be performed in 4.35484 tropical years, or in 1590.56774 days. Likewiſe for Ceres and Pallas, the fraction $\frac{3}{5} = .60$ will be the neareſt in ſmall terms, and $4\frac{3}{5} = \frac{23}{5}$, or in a more practical form, $\frac{138}{30}$ will be wheels proper for effecting a mean of the two revolutions, and two arms opening like a pair of dividers may be inſerted on a tube connected with wheel 138, when the 30 revolves in a ſolar year, in which caſe each planet will make a revolution in the ecliptic in 4.60 tropical years, or in 1680.11421 days.

We might approximate much nearer to the aſſumed periods of theſe planets by our proceſs for gaining trains, but until the periods themſelves are more nicely determined, it would anſwer no uſeful purpoſe.

*Wheels for the tropical Revolution of Jupiter.*—We come next to Jupiter, which planet, we have ſeen, runs through the ecliptic, according to La Lande's tables, in $4330^{d}\ 14^{h}\ 40\frac{1}{2}^{m}$, or in 4330.61145 days, which number divided by 365.242222 gives the ſame equal to 11.856820 tropical years; now if we take $\frac{6}{7}$ for the ſmall fraction, and 377 for the neareſt practical multiplier, we ſhall have $\frac{6 \times 377}{7 \times 377 + 1} = \frac{2260}{2640} = .856818$; and $11\frac{2260}{2640}$, or $\frac{31302}{2640}$, may be reſolved into $\frac{141 \times 222}{33 \times 80}$, which, if we take two-thirds of each leading portion, and one-half of each following, in both the numerator and denominator, will afford us the convenient train $\frac{111}{22} \times \frac{94}{40}$, the value of which is $4330^{d}\ 14^{h}\ 39^{m}\ 5^{s}$, during which time the error in time is only $1^{m}\ 25^{s}$, or a correſponding ſpace in the ecliptic equal to a *quarter* of a *ſecond*.

*Wheels for the tropical Revolution of Saturn.*—We come now to aſcertain wheels proper for the tropical revolution of Saturn, which, by the beſt tables of La Lande, is equal to $10746^{d}\ 19^{h}\ 20^{m}$, or 29.423777 tropical years; the ſeveral ſmall fractions which the ſliding rule gives, nearly equal to the decimal portion .423777, are $\frac{3}{7} = .428$, &c.; $\frac{11}{26} = .4230$, &c.; $\frac{14}{33} = 424242$; and $\frac{25}{59} = .423728$: now, if we approximate from the firſt of theſe, we ſhall have the following ratios.

| Proceſs. | Ratios. | Values. |
|---|---|---|
| $\frac{3 \times 16}{7 \times 16 + 1}$ | $= \frac{48}{113}$ | $= .4247$ |
| $\frac{3 \times 15}{7 \times 15 + 1}$ | $= \frac{45}{106}$ | $= .4245$ |
| $\frac{3 \times 14}{7 \times 14 + 1}$ | $= \frac{42}{99}$ | $= .424242 = \frac{14}{33}$ the third fraction. |
| $\frac{3 \times 13}{7 \times 13 + 1}$ | $= \frac{39}{92}$ | $= .423913$ |
| $\frac{3 \times 12}{7 \times 12 + 1}$ | $= \frac{36}{85}$ | $= .4235$ |

Theſe values are not exact enough here, and the numbers $29\frac{3}{5}\frac{7}{9}$, which are the moſt accurate, have prime numbers for the factors of their denominator, when reduced into a ſimple fraction; we muſt therefore have recourſe to $\frac{11}{26}$, the ſecond ſmall fraction for conſtructing another table of ratios, thus:

| Proceſs. | Ratios. | Values. |
|---|---|---|
| $\frac{11 \times 25}{26 \times 25 - 1}$ | $= \frac{275}{649}$ | $= .42372$ |
| $\frac{11 \times 24}{26 \times 24 - 1}$ | $= \frac{264}{623}$ | $= .42375$ |

| Proceſs. | Ratios. | Values. |
|---|---|---|
| $\left.\frac{11 \times 23}{26 \times 23 - 1}\right\}$ | $= \frac{253}{597}$ | $= .42378$ |
| $\left.\frac{11 \times 22}{26 \times 22 - 1}\right\}$ | $= \frac{242}{571}$ | $= .42381$ |
| $\left.\frac{11 \times 21}{26 \times 21 - 1}\right\}$ | $= \frac{231}{545}$ | $= .42385$ |
| $\left.\frac{11 \times 20}{26 \times 20 - 1}\right\}$ | $= \frac{220}{519}$ | $= .42389$ |
| $\left.\frac{11 \times 19}{26 \times 19 - 1}\right\}$ | $= \frac{209}{493}$ | $= .42393$ |
| $\left.\frac{11 \times 18}{26 \times 18 - 1}\right\}$ | $= \frac{198}{467}$ | $= .42398$ |
| $\left.\frac{11 \times 17}{26 \times 17 - 1}\right\}$ | $= \frac{187}{441}$ | $= .42403$ |
| $\left.\frac{11 \times 16}{26 \times 16 - 1}\right\}$ | $= \frac{176}{415}$ | $= .42409$ |
| $\left.\frac{11 \times 15}{26 \times 15 - 1}\right\}$ | $= \frac{165}{389}$ | $= .42416$ |
| $\left.\frac{11 \times 14}{26 \times 14 - 1}\right\}$ | $= \frac{154}{363}$ | $= .424242 = \frac{14}{33}$ as before. |

The moſt accurate ratio of this table is $\frac{253}{597}$, but $29\frac{25}{59}\frac{3}{7}$ is incapable of becoming a practical train when reduced into a ſimple fraction, one of the factors of the numerator being the large prime 8783, the next in accuracy is $29\frac{26}{61}\frac{4}{3} = \frac{18341}{623}$, which is not reducible into numbers low enough for a train; and $29\frac{3}{5}\frac{4}{7}\frac{2}{1}$ is alſo incapable of reduction, by reaſon of the denominator 571 being a prime number; but $29\frac{27}{54}\frac{5}{9} = \frac{19096}{649}$ is reducible into the train $\frac{124}{59} \times \frac{154}{11}$; the value of which is $10746^d\ 18^h\ 54^m\ 51^s$; this train is of the ſame value as $29\frac{2}{5}\frac{5}{9}$, obtained from the ſliding-rule alone, and may otherwiſe be more conveniently expreſſed thus, $\frac{124}{7} \times \frac{98}{59}$.

Again, $29\ \frac{231}{545} = \frac{16036}{545}$ will give us the leſs accurate train $\frac{76}{109} \times \frac{211}{5}$, the value of which is $10746^d\ 20^h\ 0^m\ 17^s.26$.

*Wheels for the tropical Revolution of the Georgian Planet.*—We come, laſtly, to the Georgian planet, which performs its circuit through the ecliptic in $30589^d\ 8^h\ 27^m$, if we confide in the accuracy of La Lande's tables, as calculated by La Lambre; let now 30589.35208 be divided by 365.24222, and we ſhall have 83.750865 tropical years for the length of the ſame period, which happens to be ſo nearly $83\frac{1}{4}$, or $\frac{335}{4}$, that an approximation ſeems unneceſſary: the train anſwering to this fraction may be $\frac{67}{10} \times \frac{100}{8} = 30589^d\ 0^h\ 52^m\ 0^s$, which time is ſo near the period aſſigned by the tables, that the error in ſpace is only about 14″ in the whole revolution.

Theſe examples will ſuffice to ſhew the application of this mode of approximation in any calculation of wheelwork that may occur in the practical conſtruction of an inſtrument, though, it muſt be confeſſed, the following method is more conciſe, as well as more ſtrictly mathematical, and therefore will generally be preferred by thoſe who underſtand it, and who may have occaſion to make new calculations for wheelwork.

It was deemed expedient to exemplify both methods, in order that, when one will not produce a convenient train, in any inſtance, the other may ſupply its defect if poſſible.

*Direct Method of Approximation.*—The method, already alluded to, of determining a ſeries of ratios, alternately above and below the value of a given incommenſurable ratio, has been treated of by a great variety of writers in different languages. [Vide Deſcriptio Automati Planetarii, Huygens. The Deſcription and Uſe of an Orrery of a New Conſtruction, Martin. Complement des Elemens d'Algebre, S. F. La Croix. Introductio in Analyſin Infinitorum, Euler. Opuſcula Analytica, Euler. Elements of Algebra, vol. ii. Euler. La Reſolution des Equations Numeriques, La Grange. Theorie des Nombres, Le Gendre. Memoires de l'Academie des Sciences de Paris, 1772. Memoires de l'Academie de Berlin, 1767, 1768, 1769, and 1776. Memoires de l'Academie de Peterſbourg, 1779. Cahier du Journal de l'Ecole Polytechnique, 52. Hutton's Tracts. Vince's Aſtronomy. Biot's Aſtronomy, &c.]

This method is attributed to Cotes as the inventor; but Huygens and Martin are the only two authors, perhaps, who have applied it to the calculation of wheelwork to repreſent the periods of the planetary motions: they were not, however, in poſſeſſion of periods quite ſo accurate as the preſent tables afford for the data of their calculations, and by giving only the theory and reſult of their method, inſtead of the arithmetical proceſs at full length, have puzzled the artiſt, and left him at a loſs how to proceed in the practical application of rules which have not been ſufficiently exemplified: indeed, the fifteen theorems of Martin, which were intended to illuſtrate, by algebraical expreſſions, the theory of determining a converging ſeries of ratios, have deterred the inſtrument maker, who is unacquainted with algebra, from entering upon calculations which carry with them the appearance of intricacy.

We ſhall, therefore, diveſt the method of approximation, which is the ſubject of our preſent chapter, of algebraical characters, and ſhall endeavour to render it intelligible by a ſucceſſion of examples, ſuch as were adopted in the laſt chapter, and ſhall diſtinguiſh it from the preceding indirect method, by calling it the *direct* method of approximation.

*General Rule.*—1. Reduce the periods of the two heavenly bodies which have their velocities compared, into the ſame denomination, by either vulgar or decimal arithmetic, and draw a line between them for the *true ratio*, or *unreduced fraction*.

2. Divide the greater by the ſmaller part of this ratio, and note the quotient; then make the diviſor a new dividend, and the remainder a new diviſor, to procure a ſecond quotient; and continue the ſame proceſs until ſeven or eight quotients are obtained, according to the common rule of obtaining a common meaſure in vulgar fractions.

3. Put $\frac{0}{1}$ for the firſt ratio, and $\frac{1}{0}$ for the ſecond, and all the ſucceeding ones may be obtained from the ſucceſſive quotients; thus, multiply by the firſt quotient the numerator of the ratio laſt obtained, and add to the product the numerator of the next preceding ratio, and this will be the numerator of a *new* ratio to follow; do the ſame with the denominators of the laſt and next preceding ratios for the denominator of the ſame new ratio; and continue this proceſs till ratios are conſtituted of all the quotients in their

due ſucceſſion, and theſe will be a ſeries of ratios, alternately above and below the value of the original true ratio, converging towards the truth in proportion generally as the ratios are more or leſs numerous.

The praxis is extremely eaſy, and thoſe readers who wiſh for a demonſtration of the theory may conſult the authors to whom a reference has been given, who have treated the ſubject mathematically.

In the examples of the ſun's rotation, and of the primary planets which follow, a ſolar year, as before, will be taken as the ſtandard period, with which the other periods will be compared, to conſtitute the true ratios, by which means we ſhall, as we proceed, contraſt the two methods of approximation.

*The Sun's Wheels.*—The true ratio between a ſolar year and the revolution of the ſun on its axis, as it regards the earth, is 25.41666 : 365.24222, or $\frac{365.24222}{25.41666}$, from which we have the annexed

Proceſs for the Sun's Rotation.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ |
| | | | | $\frac{1}{0}$ |
| 25.41666 | 365.24222<br>2541666 | 14 | $\frac{14 \times 1 + 0}{14 \times 0 + 1}$ | $\frac{14}{1}$ |
| | 11107562<br>10.66666 | | | |
| 940896 | 2541666<br>1881792 | 2 | $\frac{2 \times 14 + 1}{2 \times 1 + 0}$ | $\frac{29}{2}$ |
| 659874 | 940896<br>659874 | 1 | $\frac{1 \times 29 + 14}{1 \times 2 + 1}$ | $\frac{43}{3}$ |
| 281022 | 659874<br>562044 | 2 | $\frac{2 \times 43 + 29}{2 \times 3 + 2}$ | $\frac{115}{8}$ |
| 97830 | 281022<br>195660 | 2 | $\frac{2 \times 115 + 43}{2 \times 8 + 3}$ | $\frac{273}{19}$ |
| 85352 | 97830<br>85352 | 1 | $\frac{1 \times 273 + 115}{1 \times 19 + 8}$ | $\frac{388}{27}$ |
| 12468 | 85352<br>74808 | 6 | $\frac{6 \times 388 + 273}{6 \times 27 + 19}$ | $\frac{2601}{181}$ |
| 10554 | 12468<br>10554 | 1 | $\frac{1 \times 2601 + 388}{1 \times 181 + 27}$ | $\frac{2989}{208}$ |

As the laſt ratio of the ſeries is in every inſtance the moſt accurate in the ſeries, let it be examined, firſt, by a table of primes, as the ratios were in the preceding chapter, and if it is found to conſiſt of a prime number in either of its parts, or to have a high prime for one of its factors, try the preceding ratio, or otherwiſe ſubſtitute another quotient next in value to the one uſed in the formula, for inſtance, either unity above it, or unity below it, and try if the ratio ſo procured be a practical or diviſible one; but this ſubſtitution muſt only be made with the *laſt* quotient, and that when carried to eight ſucceſſive places; if, indeed, the numbers do not run too high, nine or ten quotients may be procured, and as many formulæ, but that extenſion will ſeldom be found to be neceſſary, unleſs one of the parts of the true ratio, which is the ground-work of the proceſs, conſiſt of more than eight figures; for it ſhould ſeem that there ought to be as many quotients as there are figures in the greater portion of the true ratio, in order that the value of the laſt figure may be involved. In the example before us, the laſt ratio, $\frac{2989}{208}$, is the ſame as was obtained by our indirect method of approximation, and is capable of conſtituting the train $\frac{13}{49} \times \frac{16}{61}$, the value of which has been ſhewn to be $25^d\ 9^h\ 59^m\ 56^s.995$.

The reaſon why the ratio is here inverted, is, that the ſun's rotation is the ſhorter period, and is to be conſidered as the *driven* portion of the train. The next preceding ratio, $\frac{2601}{181}$, conſiſts not of practical numbers; but $\frac{388}{27}$, the laſt but two, proves alſo to be the ſame as was procured by the ſliding rule for the train $\frac{27}{97} \times \frac{15}{60} = 25^d\ 9^h\ 59^m\ 31^s$.

It will have been obſerved, that the recurring decimal figures, beyond the fifth place, have been neglected in the tabular proceſs, it having been conſidered that the value ſo excluded is too inconſiderable to be regarded, particularly as the laſt ratio proves to be commenſurable in both its parts.

Should it ever hereafter be found, that the ſame ſolar *ſpots*, as they were formerly called, (but which Dr. Herſchel now denominates *openings* in the ſolar atmoſphere, which accompany the ſun's rotation,) have periodic re-appearances, the ſeries of ratios before us will be of ſervice for eſtabliſhing the exiſtence of ſuch re-appearances, and will afford data for the conſtruction of tables to predict their occurrence. If, for inſtance, we take the ratio $\frac{115}{8}$, it implies, that in eight years the ſun has 115 rotations; for $365\frac{1}{4} \times 8$ are equal to 2992 days, alſo $25.416 \times 115$ produce 2922.916, ſo that after a lapſe of eight civil years, in which are two biſſextiles, the ſame *ſpot* would be viſible on the *ſame* part of the ſun on the *ſame* day of the *ſame* month, provided it either continued ſo long, or re-appeared identically: in 19 years there would be more exactly as to the *hour* of the day 273 rotations; in 27 years the ſame occurrence would happen more accurately after 388 rotations; after 181 years the number of rotations would be 2601 very nearly; and laſtly, after the lapſe of 208 years, the deviation from the original ſituation both as to time and appearance, would not amount to an hour, provided the civil years are made ſolar ones by the omiſſion of two biſſextlies in the two centuries, for $365.24222 \times 208$ are equal to 75970.382 days, and alſo $25.41666 \times 2989$ are equal to 75970.416, in which periods the difference is only $48^m\ 57^s.6$.

*Wheels for Mercury's tropical Revolution.*—We have already ſeen that the proportion of velocity between the Earth and Mercury is as 1 to 4.151967, from which data we ſhall be enabled to determine an indefinite ſeries of ratios according to the foregoing rule, as in the annexed

Proceſs

Proceſs for Mercury's tropical Revolution.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ $\frac{1}{0}$ |
| 1.000000 | 4.151967<br>4000000 | 4 | $\frac{4\times1+0}{4\times0+1}$ | $\frac{4}{1}$ |
| 151967 | 1000000<br>911802 | 6 | $\frac{6\times4+1}{6\times1+0}$ | $\frac{25}{6}$ |
| 88198 | 151967<br>88198 | 1 | $\frac{1\times25+4}{1\times6+1}$ | $\frac{29}{7}$ |
| 63769 | 88198<br>63769 | 1 | $\frac{1\times29+25}{1\times7+6}$ | $\frac{54}{13}$ |
| 24429 | 63769<br>48858 | 2 | $\frac{2\times54+29}{2\times13+7}$ | $\frac{137}{33}$ |
| 14911 | 24429<br>14911 | 1 | $\frac{1\times137+54}{1\times33+13}$ | $\frac{191}{46}$ |
| 9518 | 14911<br>9518 | 1 | $\frac{1\times191+137}{1\times46+33}$ | $\frac{328}{79}$ |
| 5393 | 9518<br>5393 | 1 | $\frac{1\times328+191}{1\times79+46}$ | $\frac{519}{125}$ |
| 4125 | 5393<br>4125 | 1 | $\frac{1\times519+328}{1\times125+79}$ | $\frac{847}{204}$ |
| 1268 | 4125<br>3804 | 3 | $\frac{3\times847+519}{3\times204+125}$ | $\frac{3060}{737}$ |

We have here been able to advance as far as to ten quotients before the numbers became too high, and yet the laſt ratio, $\frac{3060}{737}$, or by inverſion $\frac{737}{3060}$, is the ſame as $\frac{2211}{9180}$, which was procured by our indirect method of approximation, and which affords the convenient, as well as very accurate train, $\frac{11}{90}\times\frac{67}{34}=87^{d}\ 23^{h}\ 14^{m}\ 35^{s}.726$.

If, inſtead of adopting the ratio of velocity $\frac{4.151967}{1000000}$, we had uſed the fraction conſiſting of the tropical periods reduced into minutes and decimals of a minute thus, $\frac{525948.800}{126674585}$, the ſame quotients, and, conſequently, the ſame train would have been produced as we have here obtained.

From this ſeries of ratios we ſee that, after the lapſe of 737 years, the Earth, Sun, and Mercury, will be in the ſame relative ſituation with reſpect to each other in the ecliptic, that they were at the beginning of that period, and will be nearly ſo in the years 204, 125, 79, &c. after a given time, but leſs accurately as to the *time* of the *day*, the ſmaller the number of years denominated in the ſeries.

*Wheels for the tropical Revolution of Venus.*—If we reduce the ſolar year and tropical period of Venus into minutes, the true large ratio conſtituted of theſe numbers will be $\frac{525948.8}{323561.5}$, from which we ſhall have the following proceſs of approximation:

Proceſs for the tropical Revolution of Venus.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ $\frac{1}{0}$ |
| 323561.5 | 525948.8<br>3235615 | 1 | $\frac{1\times1+0}{1\times0+1}$ | $\frac{1}{1}$ |
| 2023873 | 3235615<br>2023873 | 1 | $\frac{1\times1+1}{1\times1+0}$ | $\frac{2}{1}$ |
| 1211742 | 2023873<br>1211742 | 1 | $\frac{1\times2+1}{1\times1+1}$ | $\frac{3}{2}$ |
| 812131 | 1211742<br>812131 | 1 | $\frac{1\times3+2}{1\times2+1}$ | $\frac{5}{3}$ |
| 399611 | 812131<br>799222 | 2 | $\frac{2\times5+3}{2\times3+2}$ | $\frac{13}{8}$ |
| 12909 | 399611<br>38727 | 30 | $\frac{30\times13+5}{30\times8+3}$ | $\frac{395}{243}$ |
| 12341 | 12909<br>12341 | 1 | $\frac{1\times395+13}{1\times243+8}$ | $\frac{408}{251}$ |
| 568 | 12341<br>1136 | 21 | $\frac{21\times408+395}{21\times251+243}$ | $\frac{8963}{5514}$ |
| | 981<br>568 | | | |
| 413 | 568<br>413 | 1 | $\frac{1\times8963+408}{1\times5514+251}$ | $\frac{9371}{5765}$ |

In the ſeries of ratios here obtained the three laſt are incapable of forming factors proper for the numbers of a train, and $\frac{395}{243}$, the value of which is $224^{d}\ 16^{h}\ 38^{m}\ 22^{s}.2$, is the ſame that Martin ſays he availed himſelf of in his "Orrery of a new Conſtruction;" the train into which it is reducible may be $\frac{81}{20}\times\frac{12}{79}$.

In this example it appears the indirect method of approximation gives us a more accurate practical train, than our preſent method. Should we, however, ſubſtitute other quotients for one of the two laſt in the table, a train of greater accuracy might be procured, but perhaps not without a ſucceſſion of trials.

In the denominators of theſe ſucceſſive ratios we have alſo the equal intervals in years, after which a conjunction of Venus with the Sun, or any other particular phenomenon

of a ſimilar nature, will happen on the ſame day of the month, and even *hour*, if we take one of the moſt accurate ratios.

*Train for the Earth's annual and diurnal Motions.*—The annual and diurnal motions of the earth conſtitute the fraction or ratio $\frac{365.24222}{1.00000}$, from which we thus approximate:

Proceſs for a ſolar or tropical Year.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ $\frac{1}{0}$ |
| 1.00000 | 365.24222<br>36500000 | 365 | $\frac{365 \times 1 + 0}{365 \times 0 + 1}$ | $\frac{365}{1}$ |
| 24222 | 100000<br>96888 | 4 | $\frac{4 \times 365 + 1}{4 \times 1 + 0}$ | $\frac{1461}{4}$ |
| 3111 | 24222<br>21777 | 7 | $\frac{7 \times 1461 + 365}{7 \times 4 + 1}$ | $\frac{10592}{29}$ |
| 2444 | 3111<br>2444 | 1 | $\frac{1 \times 10592 + 1461}{1 \times 29 + 4}$ | $\frac{12053}{33}$ |
| 666 | 2444<br>1999 | 3 | $\frac{3 \times 12053 + 10592}{3 \times 33 + 29}$ | $\frac{46751}{128}$ |
| 444 | 666<br>444 | 1 | $\frac{1 \times 46751 + 12053}{1 \times 128 + 33}$ | $\frac{58804}{161}$ |
| 222 | 444<br>444 | 2 | $\frac{2 \times 58804 + 46751}{2 \times 161 + 128}$ | $\frac{164359}{450}$ |

By retaining the value of the recurring decimal throughout the proceſs, we have obtained in this example a ratio equal to the truth itſelf, which is preciſely the ſame as we before aſcertained, namely, $\frac{164359}{450} = \frac{269}{10} \times \frac{47}{9} \times \frac{13}{5}$, which in a practical form will be better thus, by inverting the fraction $\frac{10}{269} \times \frac{9}{47} \times \frac{15}{39}$, or thus, $\frac{10}{269} \times \frac{10}{26} \times \frac{18}{94} = 365^d\ 5^h\ 48^m\ 48^s$.

If we take the laſt ratio but one, $\frac{58804}{161}$, we ſhall have the train $\frac{7}{241} \times \frac{23}{61} \times \frac{15}{60} = 365^d\ 5^h\ 48^m\ 49^s.192128$, &c. in which the largeſt wheel is ſomewhat more practicable, with reſpect to its number of teeth; which movement proves to be the ſame that A. Janvier has employed in his famous ſphere lately conſtructed at Paris.

A train, however, ſtill more convenient in point of ſize, and probably more accurate than the latter, may be obtained by ſubſtituting unity for the laſt quotient 2, for the ratio $\frac{105555}{298}$, which is equal to $\frac{8}{227} \times \frac{17}{62} \times \frac{17}{60}$, the value of which, as has been before obſerved, is $365^d\ 5^h\ 47^s.3$.

Here the artiſt has his choice of three different calculations, any of which will be ſufficiently accurate for any inſtrument whatever.

The laſt ratio in this ſeries, *viz.* $\frac{164359}{450}$, points out what is the proper correction for our calendar, to make the ſolar and the civil years convertible into one another exactly, on a ſuppoſition that the year conſiſts of $365^d\ 5^h\ 48^m\ 48^s$, agreeably to La Lande's determination. If we divide 164359 by 365, we ſhall have 450 civil years, and 109 days over, which circumſtance proves that in every 450 ſolar years there ought to be neither more nor leſs than 109 leap years; or, which is the ſame thing, in 900 ſolar years, there ought to be 218 leap years; if, therefore, the leap year ſhould be omitted at the end of each of *ſeven*, and retained at the end of each of *two*, out of every *nine centuries*, then the civil and ſolar years would become coincident at the termination of each ninth century, for $\overline{7 \times 24} + \overline{2 \times 25} = 218$ exactly. The ſame reſult will ariſe thus; if we take $11^m\ 12^s$, the difference between a ſolar and civil year, and multiply 900 thereby, the product will be juſt ſeven days, which ſhews that ſeven centenary leap years ſhould be rejected in 900 years.

*Wheels for the tropical Revolution of Mars.*—If we reduce the tropical period of Mars, $686^d\ 22^h\ 18^m$, and alſo a ſolar year into minutes, we ſhall have the ratio 989178 : 525948.8 to approximate from, thus;

Proceſs for the tropical Period of Mars.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ $\frac{1}{0}$ |
| 525948.8 | 989178.0<br>5259488 | 1 | $\frac{1 \times 1 + 0}{1 \times 0 + 1}$ | $\frac{1}{1}$ |
| 4632292 | 5259488<br>4632292 | 1 | $\frac{1 \times 1 + 1}{1 \times 1 + 0}$ | $\frac{2}{1}$ |
| 627196 | 4632292<br>4390372 | 7 | $\frac{7 \times 2 + 1}{7 \times 1 + 1}$ | $\frac{15}{8}$ |
| 241920 | 627196<br>483840 | 2 | $\frac{2 \times 15 + 2}{2 \times 8 + 1}$ | $\frac{32}{17}$ |
| 143356 | 241920<br>143356 | 1 | $\frac{1 \times 32 + 15}{1 \times 17 + 8}$ | $\frac{47}{25}$ |
| 98564 | 143356<br>98564 | 1 | $\frac{1 \times 47 + 32}{1 \times 25 + 17}$ | $\frac{79}{42}$ |
| 44792 | 98564<br>89584 | 2 | $\frac{2 \times 79 + 47}{2 \times 42 + 25}$ | $\frac{205}{109}$ |
| 8980 | 44792<br>35920 | 4 | $\frac{4 \times 205 + 79}{4 \times 109 + 42}$ | $\frac{899}{478}$ |
| 8872 | 8980<br>8872 | 1 | $\frac{1 \times 899 + 205}{1 \times 478 + 109}$ | $\frac{1104}{587}$ |
| 108 | 8872<br>8856 | 82 | | |

If 82, the tenth quotient, were involved in this example, the numbers would run too high for wheelwork, from which circumſtance we may infer that the ratio 1104 : 587, procured from the ninth quotient, is very accurate; accordingly, on examination, we find it to be equal to $686^d\,22^h\,17^m\,58^s.88$, in which period the error is little more than one ſecond of time in defect; the denominator 587 of the fraction proves, however, to be a prime number; the denominator, too, of the preceding ratio is not diviſible lower than $2 \times 239$, though the numerator forms the factors $31 \times 29$; ſo that a train more convenient than $\frac{31}{239} \times \frac{232}{16}$ cannot be obtained from this ratio, the value of which is $686^d\,22^h\,34^m\,42^s$, in which time the error is much greater than in the train for this planet obtained by our indirect method of approximation. In this ſeries of ratios, and alſo in all thoſe of the ſuperior planets that follow, the *numerators* of the reſpective fractions expreſs the ſolar years, in which the ſame phenomena, or poſition, with reſpect to the Earth and Sun, or to any particular ſtar in the heavens, will recur after a number of revolutions, expreſſed by the denominators reſpectively.

*The Wheels for Veſta's tropical Revolution.*—If we take the tropical revolution of this planet at 3.65515 tropical years, we ſhall have the ſubjoined reſult.

Proceſs for Veſta's tropical Revolution.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ |
| | | | | $\frac{1}{0}$ |
| 100000 | 3.65515<br>300000 | 3 | $\frac{3 \times 1 + 0}{3 \times 0 + 1}$ | $\frac{3}{1}$ |
| 65515 | 100000<br>65515 | 1 | $\frac{1 \times 3 + 1}{1 \times 1 + 0}$ | $\frac{4}{1}$ |
| 34485 | 65515<br>34485 | 1 | $\frac{1 \times 4 + 3}{1 \times 1 + 1}$ | $\frac{7}{2}$ |
| 31030 | 34485<br>31030 | 1 | $\frac{1 \times 7 + 4}{1 \times 2 + 1}$ | $\frac{11}{3}$ |
| 3455 | 31030<br>27640 | 8 | $\frac{8 \times 11 + 7}{8 \times 3 + 2}$ | $\frac{95}{26}$ |
| 3390 | 3455<br>3390 | 1 | $\frac{1 \times 95 + 11}{1 \times 26 + 3}$ | $\frac{106}{29}$ |
| 65 | 3390<br>325 | 50 | | |
| | 40 | | | |

In this example we have arrived at the ſame reſult as we did before by the ſliding rule only; and the 7th quotient, 50, being large, ſhews, that if it ſhould be involved, the numbers would run higher than our preſent knowledge of the length of the period warrants.

*Wheels for the tropical Revolution of Juno.*—Taking Juno's tropical period at 4.35528 tropical years, we ſhall have the following ratios.

Proceſs for Juno's tropical Revolution.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ |
| | | | | $\frac{1}{0}$ |
| 100000 | 4.35528<br>400000 | 4 | $\frac{4 \times 1 + 0}{4 \times 0 + 1}$ | $\frac{4}{1}$ |
| 35528 | 100000<br>71056 | 2 | $\frac{2 \times 4 + 1}{2 \times 1 + 0}$ | $\frac{9}{2}$ |
| 28944 | 35528<br>28944 | 1 | $\frac{1 \times 9 + 4}{1 \times 2 + 1}$ | $\frac{13}{3}$ |
| 6584 | 28944<br>26336 | 4 | $\frac{4 \times 13 + 9}{4 \times 3 + 2}$ | $\frac{61}{14}$ |
| 2608 | 6584<br>5216 | 2 | $\frac{2 \times 61 + 13}{2 \times 14 + 3}$ | $\frac{135}{31}$ |
| 1368 | 2608<br>1368 | 1 | $\frac{1 \times 135 + 61}{1 \times 31 + 14}$ | $\frac{196}{45}$ |
| 1240 | 1368<br>1240 | 1 | $\frac{1 \times 196 + 135}{1 \times 45 + 31}$ | $\frac{331}{76}$ |
| 128 | 1240<br>1152 | 9 | | |

Here, again, the fifth quotient gives the ſame ratio $\left(\frac{135}{31}\right)$ which we obtained before, and is perhaps as accurate as is neceſſary for the preſent, till the period itſelf is further rectified; if not, $\frac{196}{45}$ may be taken; but the 331 in $\frac{331}{76}$ is a prime, and the laſt quotient, 9, would increaſe the numbers too much, unleſs a train were required for an inſtrument with a compound fraction, which may be eaſily obtained by purſuing the proceſs a little further.

*Wheels for the tropical Revolution of Ceres and Pallas.*—We have already propoſed to take an average of the periods of theſe two planets at 4.603386 tropical years, according to which aſſumption we may proceed, as in the annexed table, to find one ratio of a practical ſize for the motions of both.

Proceſs for the tropical Revolution of Ceres and Pallas.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ |
| | | | | $\frac{1}{0}$ |
| 1.00000 | 4.60339<br>.400000 | 4 | $\frac{4 \times 1 + 0}{4 \times 0 + 1}$ | $\frac{4}{1}$ |
| 60339 | 100000<br>60339 | 1 | $\frac{1 \times 4 + 1}{1 \times 1 + 0}$ | $\frac{5}{1}$ |
| 39661 | 60339<br>39661 | 1 | $\frac{1 \times 5 + 4}{1 \times 1 + 2}$ | $\frac{9}{2}$ |
| 20678 | 39661<br>20678 | 1 | $\frac{1 \times 9 + 5}{1 \times 2 + 1}$ | $\frac{14}{3}$ |
| 18983 | 20678<br>18983 | 1 | $\frac{1 \times 14 + 9}{1 \times 3 + 2}$ | $\frac{23}{5}$ |
| 1695 | 18983<br>1695<br>1933<br>1695 | 11 | $\frac{11 \times 23 + 14}{11 \times 5 + 3}$ | $\frac{267}{58}$ |
| 238 | 1695<br>1666 | 7 | $\frac{7 \times 267 + 23}{7 \times 58 + 5}$ | $\frac{1892}{643}$ |

In this ſeries of ratios 643, the denominator of the moſt accurate fraction is a prime number, but the preceding fraction is reducible into $\frac{3 \times 87}{58} = \frac{60}{20} \times \frac{87}{58}$, or more conveniently for practice $\frac{87}{20} \times \frac{60}{58}$, the value of which is $1681^d\ 8^h\ 58^m\ 41^s$, the aſſumed mean being $1681^d\ 8^h\ 20^m\ 30^s$. The ratio $\frac{23}{5}$ is the ſame as was before determined from the ſliding rule, without further approximation.

*Wheels for the tropical Revolution of Jupiter.*—The ratio of Jupiter's velocity in the ecliptic to that of the earth is 11.85682 : 1.00000, therefore we muſt proceed thus:

Proceſs for Jupiter's tropical Revolution.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ |
| | | | | $\frac{1}{0}$ |
| 1.00000 | 11.85682<br>1100000 | 11 | $\frac{11 \times 1 + 0}{11 \times 0 + 1}$ | $\frac{11}{1}$ |
| 85682 | 100000<br>85682 | 1 | $\frac{1 \times 11 + 1}{1 \times 1 + 0}$ | $\frac{12}{1}$ |
| 14318 | 85682<br>71590 | 5 | $\frac{5 \times 12 + 11}{5 \times 1 + 1}$ | $\frac{71}{6}$ |
| 14092 | 14318<br>14092 | 1 | $\frac{1 \times 71 + 12}{1 \times 6 + 1}$ | $\frac{83}{7}$ |
| 226 | 14092<br>1356<br>532<br>452 | 62 | $\frac{62 \times 83 + 71}{62 \times 7 + 6}$ | $\frac{5217}{440}$ |
| 80 | 226<br>160 | 2 | $\frac{2 \times 5217 + 83}{2 \times 440 + 7}$ | $\frac{10517}{887}$ |
| 66 | 80<br>66 | 1 | $\frac{1 \times 10517 + 5217}{1 \times 887 + 440}$ | $\frac{10734}{1327}$ |
| 14 | 66<br>56 | 4 | | |

The denominators in the two laſt ratios of this ſeries are both prime numbers, and if we were to uſe the eighth quotient, the numbers would run too high for two factors of a moderate ſize; alſo if 2 be ſubſtituted for unity in the ſeventh quotient, the denominator will be ſtill a prime number; we muſt, therefore, neceſſarily ſubſtitute unity for 2 in the ſixth quotient, by which ſubſtitution we ſhall have the ratio or fraction $\frac{5300}{447} = \frac{159}{9} \times \frac{100}{149}$ when put into a practical form, the period correſponding to which is $4330^d\ 14^h\ 41^m\ 17^s.8$, which is ſomewhat more accurate than the one we determined by our indirect method of approximation, but not ſo convenient for practical conſtruction. The numbers $\frac{83}{7}$, obtained from the fourth quotient, are thoſe uſed in the common planetarium of the ſhops.

*Wheels*

*Wheels for the tropical Revolution of Saturn.*—Saturn performs his revolution through the ecliptic, as we have ſeen, in 29.42377 tropical years, therefore we may proceed by the following proceſs.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ |
| | | | | $\frac{1}{0}$ |
| 1.00000 | 29.42377<br>2900000 | 29 | $\frac{29 \times 1 + 0}{29 \times 0 + 1}$ | $\frac{29}{1}$ |
| 42377 | 100000<br>84754 | 2 | $\frac{2 \times 29 + 1}{2 \times 1 + 0}$ | $\frac{59}{2}$ |
| 15246 | 42377<br>30492 | 2 | $\frac{2 \times 59 + 29}{2 \times 2 + 1}$ | $\frac{147}{5}$ |
| 11885 | 15246<br>11885 | 1 | $\frac{1 \times 147 + 59}{1 \times 5 + 2}$ | $\frac{206}{7}$ |
| 3361 | 11885<br>10083 | 3 | $\frac{3 \times 206 + 147}{3 \times 7 + 5}$ | $\frac{765}{26}$ |
| 1802 | 3361<br>1802 | 1 | $\frac{1 \times 765 + 206}{1 \times 26 + 7}$ | $\frac{971}{33}$ |
| 1559 | 1802<br>1559 | 1 | $\frac{1 \times 971 + 765}{9 \times 33 + 26}$ | $\frac{1736}{59}$ |
| 243 | 1559<br>1458 | 6 | $\frac{6 \times 1736 + 971}{6 \times 59 + 33}$ | $\frac{11387}{387}$ |

The numerator in the laſt ratio of the ſeries is not capable of affording practical factors, and the preceding ratio, $\frac{1736}{59}$, is the ſame as the one already determined both by the ſliding rule, and by our indirect method of approximation.

We come, laſtly, to the tropical revolution of the Georgian planet, which we have ſeen revolves through the ecliptic in 30589.35208 days, and its numbers may be aſcertained by the following proceſs.

| Diviſors. | Dividends. | Quotients. | Formulæ. | Ratios. |
|---|---|---|---|---|
| | | | | $\frac{0}{1}$ |
| | | | | $\frac{1}{0}$ |
| 365.24222 | 30589.35208<br>2921937777 | 83 | $\frac{83 \times 1 + 0}{83 \times 0 + 1}$ | $\frac{83}{1}$ |
| | 136997431<br>109572666 | | | |
| 27424764 | 36524222<br>27424764 | 1 | $\frac{1 \times 83 + 1}{1 \times 1 + 0}$ | $\frac{84}{1}$ |
| 9099457 | 27424764<br>27298373 | 3 | $\frac{3 \times 84 + 83}{3 \times 1 + 1}$ | $\frac{335}{4}$ |
| 126391 | 9099457<br>884737 | 71 | $\frac{71 \times 335 + 84}{71 \times 4 + 1}$ | $\frac{23869}{285}$ |
| | 252087<br>126391 | | | |
| 125696 | 126391<br>125696 | 1 | $\frac{1 \times 23869 + 335}{1 \times 285 + 4}$ | $\frac{24204}{289}$ |
| 694 | 125696 | 181 | | |

The value of the laſt ratio of this ſeries is equal to 83.7508650 tropical years, which differs from the exact truth only unity in the ſeventh place of decimals, but unfortunately it is not reducible into lower numbers than $\frac{2017 \times 12}{17 \times 17}$; and the numerator of the next preceding ratio is a prime number, ſo that we muſt either uſe $\frac{335}{4}$, which has been before determined, or otherwiſe ſubſtitute another quotient for 71; the moſt convenient, we find from a few trials, will be 66, which gives the ratio $\frac{22194}{265}$, the value of which is a revolution in 83.750943 tropical years, or 30589$^d$ 9$^h$ 8$^m$ 10$^s$.7, and is capable of forming the train $\frac{162}{5} \times \frac{137}{53}$.

Theſe examples of all the primary planets given at full length, and accompanied by our remarks on them, will enable any well educated inſtrument maker to aſcertain wheelwork from any other data which he may have occaſion to employ, and will ſerve, at the ſame time, to ſhew that the two methods of approximating towards the truth, where the original numbers run too high for conſtruction in practice, ſupply the defects of each other in particular caſes, but generally come by different routes to the ſame mark.

By either of theſe methods, the periods of all the ſecondary planets may be repreſented by ratios ſuitable for compoſing

compoſing wheelwork, and any particular time may be aſſumed, that the machine moſt conveniently admits of, for the period in which the firſt driver revolves. For inſtance, the motion of the moon's apogee, or nodes, may be taken from the lunation; and the lunation from either a ſolar day, or a ſolar year. Likewiſe the ſatellites of Jupiter may have their motions given from one day, or ſeven days, or any other period conſiſting of days and fractional parts of a day, when reduced into one denomination; all which calculations will fall under our examination, when we come to treat of the machines, where they occur, under our articles ORRERY, and PLANETARIUM, but an account of which would lengthen our preſent article too much, were it given in this place.

*Numbers for ſynodic Revolutions.*—We muſt not, however, conclude our preſent article on planetary numbers, before we have made ſome remarks on the ſynodic revolutions of the primary planets, particularly as we ſhall have occaſion to deſcribe in another place, a very ſuperior machine conſtructed entirely from calculations founded on the ſynodic periods. If it were required to aſcertain the mean ſynodic period, or time elapſed between two ſucceſſive conjunctions or oppoſitions of any two planets, as ſeen from the ſun, or of the ſun and one of them as ſeen from the other, which is indeed the ſame thing, we muſt take the difference of the mean daily motions of thoſe planets as given in the tables, and divide 360° thereby, and the quotient will give the required number of days between two ſuch mean conjunctions; for inſtance, ſuppoſe it were required to determine the number of days between two ſucceſſive oppoſitions or conjunctions of Venus with the ſun, as ſeen from the Earth, or with the Earth, as ſeen from the Sun; the mean daily motion at Venus is 1° 36′ 7″.8, and of the Sun (or rather Earth) 0° 59′ 8″.33, the difference between which is 0° 36′ 59″.47, or 2219″.47, by which if we divide 1296000″ we ſhall have 583,923 days for the mean time between two ſucceſſive conjunctions or oppoſitions, as the caſe may be, which mean time would alſo be the *true* time, if the Earth and Venus had no equation of the centre, and conſequent acceleration and retardation in the different parts of their orbits; if we take Mercury inſtead of Venus, the ſynodic period at a mean rate would be $\frac{1296000}{11184.24} = 115{,}877$ days; but as Mercury's orbit has conſiderable excentricity, the ſynodic period in any given year may exceed or fall ſhort of this number by many days, accordingly as the ſun's place may be near the aphelion or perihelion of the planet's orbit, when the conjunction or oppoſition takes place. Again, if we take Mercury and Venus, the ſynodic period will be $\frac{1296000}{8964.77} = 144.566$ days, but ſubject to an exceſs or defect ariſing from the relative ſituations in their reſpective orbits. In the ſame manner we may uſe the difference of any two other mean daily motions, to aſcertain their ſynodic period, agreeably to the reſults contained in the ſubjoined table, which we beg leave to inſert here on account of its novelty as well as utility.

A TABLE of the relative mean ſynodic Revolutions of all the primary Planets, expreſſed in Days and Parts of a Day.

| Planets. | Georgian. | Saturn. | Jupiter. | Pallas and Ceres. | Juno. | Veſta. | Mars. | Earth. | Venus. |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 88.290 | 88.694 | 89.792 | 92.825 | 93.118 | 94.174 | 100.888 | 115.877 | 144.566 |
| Venus | 226.358 | 229.493 | 236.993 | 259.355 | 261.654 | 270.169 | 333.917 | 583.923 | |
| Earth | 370.713 | 378.091 | 398.892 | 466.606 | 474.101 | 502.813 | 779.938 | | |
| Mars | 702.713 | 733.836 | 816.434 | 1161.394 | 1208.955 | 1415.002 | | | |
| Veſta | 1395.950 | 1524.347 | 1930.007 | 6480.000 | 8302.370 | | | | |
| Juno | 1678.104 | 1867.166 | 2514.552 | 2952.164 | | | | | |
| Ceres and Pallas | 1779.242 | 1993.233 | 2748.674 | | | | | | |
| Jupiter | 5044.960 | 7253.595 | | | | | | | |
| Saturn | 16568.625 | | | | | | | | |

N.B. In this table the ſynodic periods of Veſta, Juno, Ceres, and Pallas, muſt not be conſidered as perfectly accurate; their tropical periods being not yet completely aſcertained.

As an example of the uſe of this table, ſuppoſe the ſynodic revolution of Mars were required, as ſeen from Jupiter; look for Mars on the left hand column, and Jupiter at the top of the table, and at the junction of the horizontal and vertical columns, in which thoſe planets ſtand reſpectively, is the number 816.434, the number of days required. In like manner, the number of days for Venus and the Earth is 583.923.

In the courſe of our making calculations for the motions of the heavenly bodies, where ſome of the wheelwork was placed on ſtationary, and ſome on moveable bars, a diſcovery was made, relating to ſynodic revolutions, which will appear extraordinary, even to the ſcientific reader; which is this, that if the wheelwork which has been calculated to repreſent or produce the ſynodic revolutions of either of the interior planets, be placed upon the Earth's annual bar, (or radius vector,) *thoſe ſame calculations* will be proper for exhibiting the tropical revolution of that planet, as ſeen from the ſun. This circumſtance we have already glanced at, when calculating the tropical period of Venus by our indirect method of approximation, but we will now illuſtrate the obſervations we have made by an example. In a ſmall orrery, at preſent before us, the ratio between the tropical revolution of Venus and a ſolar year is calculated to be $\frac{2016}{3277}$, but becauſe the wheelwork compoſed of this ratio is carried by the Earth's annual arm, at leaſt ſuch parts of it as revolve out of the centre of the inſtrument, Venus is carried *once* round, independently of the calculations, in every year, by a puſh given to the laſt wheel in the train, moving in the centre round the ſun's ſtem, as the Earth's arm goes round it, while the teeth of all the wheels are connected; *unity* is, therefore, ejected out of the ratio before the train is compoſed, thus; the numerator 2016 is ſubtracted from the denominator 3277, and the remainder, 1261, is taken as the denominator of the reduced

reduced ratio, out of which the train is compoſed; now we ſay that $\frac{2016}{3277}$ of 365.24222 days is equal to the tropical period $224^d\ 16^h\ 42^m\ 1^s$, but that $\frac{2016}{1261}$, of the ſame ſtandard, is equal to the ſynodic revolution 583.924 days, very nearly as in our table. Hence when we have procured the exact ratio between the tropical periods of the Earth and an interior planet, we can immediately procure the length of a mean ſynodic revolution of the latter, without regard being had to the daily motions, as is uſually done by aſtronomical writers.

The ſame obſervation is equally true with reſpect to any other two of the planets in the ſyſtem, whoſe tropical ratio is known, provided the diminiſhed part be made the denominator of the fraction conſtituted by the ſaid ratio. To a want of attention to this ſort of reduction of a tropical into a ſynodic period, and *vice verſâ*, is owing the very great inaccuracy of ſome inſtruments of illuſtration at preſent to be met with in the ſhops; particularly of that common orrery, known by the name of *Ryley's*, in which the *ſynodic* revolutions of both Mercury and Venus are produced in periods which were intended, by the contriver, to be either *ſidereal* or *tropical*, and which are actually conſidered to be ſo by the inſtrument makers. Thus thoſe periods which *ought* to be 115.877 and 583.923 days reſpectively, are only about 86½ and 219½; in the latter of which inſtances the velocity of the planet, in its orbit, is conſiderably more than *double* its true velocity, and yet the error has never, that we know of, been detected by any one; a convincing proof this of the inattention, not only of thoſe who conſtructed, but alſo of thoſe who have uſed this little machine, to explain the nature of the planetary motions!

NUMBERING RODS. See NEPER's *Bones*.

NUMBERS, in *Biblical Hiſtory*, a canonical book of the Old Teſtament, one of the five books called the Pentateuch, and aſcribed juſtly, as we conceive, to Moſes the Jewiſh lawgiver. It is ſo called becauſe it begins with the numbering of the children of Iſrael that came out of Egypt; to which are ſubjoined the laws given to them for the ſpace of 39 years, whilſt they were in the wilderneſs. See PENTATEUCH.

NUMELLA, among the Romans, an engine of wood uſed in puniſhing offenders, whoſe necks and feet were made faſt in it.

NUMELLA was likewiſe uſed to denote a rope or cord made of raw ox-hides to bind beaſts with.

NUMENIA, Νουμηνια, or νεομηνια, in *Antiquity*, a feſtival obſerved at the beginning of every lunar month, in honour of all the gods, but eſpecially Apollo, who was called Νεομενιος, becauſe the ſun is the author of all lights; for whatever diſtinction of times and ſeaſons may be taken from other planets, yet they are all owing to him, as the original and fountain of all thoſe borrowed rays, which the reſt have only by participation from him.

For the ceremonies of this ſolemnity, ſee Potter, Arch. tom. i. p. 416.

NUMENIASTÆ, Νουμηνιαστα, a deſignation given to thoſe who kept a feſtival on every new moon. See NUMENIA.

NUMENIUS, in *Biography*, a Greek philoſopher of the Platonic ſchool, who is ſuppoſed to have flouriſhed under the reign of the emperor Marcus Aurelius, was born at Apamea in Syria. He was regarded as an oracle for wiſdom, and is mentioned with reſpect both by Plotinus and Origen. Of the works which he wrote none are now extant, excepting ſome fragments preſerved by Euſebius, Theodoret, and Clemens Alexandrinus. He is ſaid to have maintained that Plato borrowed from Moſes what he advanced concerning God and the creation of the world. Moreri. Enfield's Hiſt. Phil.

NUMENIUS, in *Ornithology*, a name uſed by authors for the different ſpecies of the *Scolopax* and *Tantalus*; which ſee.

NUMERAL FIGURES. The antiquity of theſe in England has been ſuppoſed as high as the eleventh century, from an ancient date found at Colcheſter, at firſt thought to expreſs 1090; the figure in the place of hundreds being taken for a cypher, by not attending to the inſide ſtrokes, which were pretty nearly defaced; but upon a more accurate view that miſtake was diſcovered, and the date found to be 1490. See Phil. Tranſ. N° 439 and 475. See ARABIC *Figures*, and FIGURES.

NUMERAL *Letters*, thoſe letters of the alphabet which are generally uſed for figures; as, I, V, X, L, C, D, M.

NUMERAL *Characters*. See CHARACTERS.

NUMERALS, in *Grammar*, are thoſe words which expreſs numbers; as ſix, eight, ten, &c. See ORDINALS.

NUMERATION, in *Arithmetic*, the art of eſtimating or pronouncing any number, or ſeries of numbers.

The characters, whereby numbers are ordinarily expreſſed, are the nine following ones; 1, 2, 3, 4, 5, 6, 7, 8, 9. It being the law of the common numeration, that when you are arrived at ten, you begin again, and repeat as before; only expreſſing the number of tens.

Weigelius, indeed, ſhews how to number, without going beyond a quaternary; *i. e.* by beginning to repeat at each fourth. And Leibnitz, in what he calls his "binary arithmetic," begins to repeat at every ſecond; only uſing two characters, 1 and 0. But theſe are rather matters of curioſity than uſe.

That the nine numerical notes may expreſs not only units but alſo tens or decads, hundreds or centuries, thouſands, &c. they have a local value given them; ſo as that, when either alone, or when placed in the right-hand place, they denote units; in the ſecond place, tens; in the third, hundreds; and in the fourth, thouſands.

Now to expreſs any written number, or aſſign the proper value to each character: divide the propoſed number by commas into claſſes, allowing three characters in each claſs, beginning at the right hand. Over the right-hand figure of the third claſs, add a ſmall mark, or tranſverſe line; over the right-hand figure of the fifth claſs, add two marks, or tranſverſe lines; over that of the ſeventh, three, &c. The number of the left hand of the firſt comma, expreſs by thouſands; that which has over it the firſt tranſverſe line, expreſs by millions; that with two, by billions; that with three, by trillions, &c. Laſtly, the left-hand character of each claſs, expreſs by hundreds; the middle one by tens; and the right-hand one by units. Thus will the numeration be effected.

*E. gr.* The following numbers $2'''$; $125{,}473''$, $613{,}578'$, $432{,}597$, is thus expreſſed or read: two trillions, one hundred twenty-five thouſand four hundred ſeventy-three billions, ſix hundred thirteen thouſand five hundred ſeventy-eight millions, four hundred thirty-two thouſand five hundred and ninety-ſeven.

NUMERATOR, in ſpeaking of fractions, ſignifies the number which ſhews how many of thoſe parts, which the

integer is ſuppoſed to be divided into, are expreſſed by the fraction.

The numerator is that part of a fraction which is placed over the little bar, by which it is ſeparated from the under number called the denominator, and which ſhews into how many parts the integer is divided.

Thus, *v. gr.* $\frac{7}{10}$ expreſſes ſeven tenths; where ſeven is the numerator and ten the denominator. See FRACTION.

NUMERIANUS, M. AURELIUS, in *Biography*, an emperor of Rome, in conjunction with CARINUS, (ſee his article,) was ſecond ſon of the emperor Carus. On the death of his father in the year 283 of the Chriſtian era, Numerianus, with Carinus his elder brother, ſucceeded to the imperial dignity without oppoſition. They had been nominated Auguſti by their father, whom Numerianus had accompanied in his expedition into Perſia. This young prince was diſtinguiſhed by the promiſing qualities of his temper and underſtanding. He was mild and affable, and had from a very early period cultivated literature with ſucceſs. Being, in his youth, in a private ſtation, he had exerciſed his talents for oratory in pleading cauſes, and ſeveral of his harangues had been given to the public, in which the declamatory eloquence of the age appeared with luſtre. Gibbon, in ſpeaking of the brothers, ſays, "Carinus was unworthy to live: Numerian deſerved to reign in a happier period. His affable manners and gentle virtues ſecured him, as ſoon as they became known, the regard and affection of the public. He poſſeſſed the elegant accompliſhments of a poet and orator, which dignify, as well as adorn, the humbleſt and the moſt exalted ſtations. But the talents of Numerian were rather of the contemplative, than of the active kind." When his father's elevation reluctantly forced him from the ſhade of retirement, neither his temper nor his purſuits had qualified him for the command of armies. His conſtitution was deſtroyed by the hardſhips of the Perſian war; and he had contracted, from the heat of the climate, ſuch a weakneſs in his eyes, as obliged him, in the courſe of a long retreat, to confine himſelf to the ſolitude or darkneſs of a tent or litter. The adminiſtration of all affairs, civil as well as military, was devolved on Arrius Aper, the Prætorian prefect, who, to the power of his important office, added the honour of being father-in-law to Numerian. The army was eight months on its march from the banks of the Tigris to the Thracian Boſphorus, and during all that time the imperial authority was exerciſed in the name of the emperor, who never appeared to his ſoldiers. Suſpicions at length ſpread among them that their emperor was no longer living, and they could not be prevented from breaking into the imperial tent, where they diſcovered only the corpſe. How or what time he died was never aſcertained, but the general voice accuſed Aper of being his murderer: his concealment was interpreted as an evidence of guilt, and the meaſures which Aper had taken to ſecure his election, became the immediate occaſion of his ruin: Diocletian, commander of the body-guards, was choſen in the room of Numerianus, and conſcious that his peculiar ſituation might expoſe him to ſuſpicion, he aſcended the tribunal, and raiſing his eyes to the ſun, made a ſolemn profeſſion of his own innocence, in the preſence of that all-ſeeing Deity: then, aſſuming the tone of a ſovereign and judge, he commanded that Aper ſhould be brought in chains to the foot of the tribunal. "This man," ſaid he, "is the murderer of Numerian," and without giving him time to enter on a juſtification of his conduct, drew his ſword, and buried it in the breaſt of the unfortunate prefect. (See DIOCLESIAN.) Gibbon's Roman Hiſtory, vol. ii.

NUMERICAL, NUMEROUS, or *Numeral*, ſomething that relates to number.

NUMERICAL *Algebra* is that, which makes uſe of numbers, inſtead of letters of the alphabet.

NUMERICAL *Difference*, is the difference whereby one individual is diſtinguiſhed from another.

Hence a thing is ſaid to be numerically the ſame, *idem numero*, or *numerice*, when it is the ſame in the ſtricteſt ſenſe of the word. See UNITY and IDENTITY.

NUMERO, in *Commerce*, &c. a term prefixed to any number of things; marked or abbreviated thus, N°. See BOOK.

*De* NUMERO, *i. e.* by tale, is uſed in ancient authors for the payment *e. gr.* of a pound in a certain number of pieces, *viz.* twenty ſhillings.

In contradiſtinction to *libra penſa*, or a pound weighed out.

NUMEROUS ARITHMETIC. See ARITHMETIC.

NUMEROUS *Exegeſis*. See EXEGESIS.

NUMIDIA, in *Ancient Geography*, a country of Africa, comprehended, according to Strabo, the kingdoms of the Maſſyli and Maſſæſyli, the laſt of which was bounded on the W. by the river Mulucha or Molochath, as the firſt was on the E. by the Tuſca. On the N. it was limited by the Mediterranean; on the S. by Gætulia, or part of Libya interior; on the W. by the Mulucha, which ſeparated it from Mauritania, and on the E. by the Tuſca, a boundary which it had in common with Africa Propria. Its length was probably, allowing Mulucha to be the preſent Mullooïah of the Algerines, and Tuſca to be Zaine, above 500 miles; but its breadth cannot be ſo eaſily aſcertained. However, if we ſuppoſe it to be nearly the ſame with the preſent kingdom of Algiers, which we have reaſon to believe was actually the caſe, it muſt in the narroweſt part have been about 40 miles; that being the diſtance near Tlemſan from the deſert or Sahara to the ſea-coaſt, and above 100 in the broadeſt. In the times of the Carthaginians, Numidia contained the two powerful nations of the Maſſyli and the Maſſæſyli. Numidia, including Numidia Propria, or the country of the Maſſyli, and Mauritania Cæſarienſis, or that of the Maſſæſyli, extended from 34° 5′ to 37° N. lat., and from 1° 15′ W. to 9° 16′ E. of London.

Numidia Propria, or as it is ſometimes called, Terra Metagonitis, was ſeparated from the proper territory of Carthage by its eaſtern boundary, the river Tuſca, and from the kingdom of the Maſſæſyli, or Mauritania Cæſarienſis, according to Pliny, by the Ampſaga. This ſeems to correſpond with that part of the province of Conſtantina lying between the Zaine and the Wed el Kibeer, which is above 130 miles long and more than 100 broad. On the ſea-coaſt this province is, in general, mountainous and rocky, and therefore called by Abulfeda, not improperly, "El Adwah," the high or lofty. The principal places in this province were Cirta, Vaga, Azama, Collops Magnus, Tacatwa, Hippo Regius, Tabraca, Naragara, Sicca, Thirmida, Suthul, and Madaura. The mountains were the ridge that terminated the country between the parallels of Sitifi and Cirta, called by the ancients Buzara, Thambes, extending to Tabraca, the Mampſarus of Ptolemy, which ſeparated the Sahara from Mauritania Stifenſis, and the Mons Audus of Ptolemy, or the Mons Auraſius of the middle ages, known among the Turks by the name of Jibbel Aureſs. The rivers are the Ampſaga, the Armua of Pliny or modern Sei-bouſe, the Rubricatus of Ptolemy or Ma-fragg of the Algerines, and the Tuſca now called the Zaine.

The

The limits and extent of the Regio Maſſæſylorum of Strabo, or the Mauritania Cæſarienſis of Dio, being the tract lying between the Mulucha and Ampſaga, are aſcertained by the determination of thoſe of Numidia in general, and Numidia Propria, or the country of the Maſſæſyli, in particular. The length of the former province, indeed, much exceeded that of the latter; but its breadth was not conſiderable, being at a medium only about 20 leagues, except in that part which bordered upon the confines of the Maſſyli. It lay betwixt 34° 30′ and 37° N. lat., and extended from 1° 15′ W. to 6° 30′ E. long. from London. It included that part of the country of the Weſtern Moors, bounded on the W. by the Mullooïah, and on the E. by the mountains of Trara; thoſe provinces of the kingdom of Algiers, called Tlemſan and Titterie; together with the weſtern part of that known by the name of Conſtantia. The principal towns were Igilgili, Saldæ, Ruſazus, Ruſucurium, Ruſconium, Icoſium, Tipaſa, Jol, Canucius or Ganugus, Cartenna, Arſenaria, Quiza, Siga, Sitifi and Satafi, Auzia or Auzea, Tubuſuptus, &c. &c. The promontories were the Audus and Vabar of Ptolemy, the promontorium Apollinis, or cape Tennes of modern geographers, the promontorium Magnum of Ptolemy, now called by ſailors Cape Hone, being a continuation of the mountains of Trara. The remarkable mountains are part of mount Atlas, the Zalacus of Ptolemy, mount Malathubalus, the Durdus of Ptolemy, the Mons Phruræſus, and the Montes Chalcorychii. The moſt remarkable rivers were the Audus, the Siſaris, the Niſſava, or preſent Boujeiah, the Sarbatis, now the Yſſer, the Savus or modern Hameeſe, the Chinalaph of Ptolemy or Shelliff of the Algerines, the Cartennes, the Flumen Salſum, at preſent called the Wed el Mailah, and Aſſara or Iſſer of Abulfeda. The only iſlands that deſerve attention are the Acra of Scylax, forming the modern part of Harſhgoone, and the Tres Inſulæ of Antoninus, about 10 miles N.W. of the river Mulucha.

The aborigines of Numidia were the deſcendants of Put or Phut; but theſe were not the only ancient inhabitants, becauſe the Phœnicians in almoſt the earlieſt ages ſent colonies thither. Although a conſiderable part, if not the whole, of Interior Numidia was independent on the Carthaginians, the Numidians always aſſiſted the Carthaginians in their wars; and the Carthaginian form of government prevailed in every part of Numidia ſubject to the ſtate of Carthage, though in other parts abſolute monarchy was eſtabliſhed. The principal objects of worſhip among the firſt Numidians were the ſun and moon; and where the dominion of Carthage extended, divine honours were paid to the Phœnician and Greek deities. Notwithſtanding the barbarity of the Numidians, ſome of them uſed letters, not very unlike thoſe that made up the Punic alphabet, as appears from the legends of ſeveral ancient Numidian coins. The Numidians were divided into tribes, nomes, or hordes; and their circular dou-wars were compoſed of their mapalia, correſponding to the khymas or tents of the modern Bedoweens. Theſe mapalia were ſecured from the heat and inclemency of the weather by a covering of hair-cloth. They were all of the ſame oblong form, reſembling the inverted bottom of a ſhip. A whole tribe encamped together, and having conſumed the produce of one fruitful ſpot, migrated to another. Some of them lived in fixed habitations or cottages, made of hurdles daubed over with mud, or conſtructed of ſlight materials, and theſe they called magaria. The towns or villages formed of theſe huts are at preſent built upon eminences, and, as Dr. Shaw informs us, they are called daſhkras. The Numidians rode without ſaddles, and many of them without bridles, whence Virgil calls them "Numidæ Infræni;" and as their principal ſtrength conſiſted in their cavalry, they were accuſtomed to the management of horſes from their infancy. The next brother of the king, and not his eldeſt ſon, ſucceeded to the crown in Numidia. The diet of the Numidians conſiſted chiefly of herbs, grain, pulſe, and water; and they ſeldom uſed wine or fleſh. Many of the poorer claſs went almoſt naked; but thoſe of any faſhion wore their garments looſe, without faſh or girdle. They were eminent for their ſkill in hurling the javelin and throwing darts, which they uſed in war: and they choſe to come to a general action in the night. Amongſt them deſertion was no diſgrace.

Before the firſt arrival of the Phœnicians, Numidia was thinly peopled; and this happened above 300 years before the foundation of Carthage. Little is now known of theſe people for ſeveral of the earlieſt centuries; and it would lead us beyond our preſcribed limits, if we gave a minute detail of their conflicts with the Carthaginians and with the Romans. Towards the cloſe of the exiſtence of Numidia as an independent kingdom, Juba, the ſon of a Numidian prince, deſcended from Maſſiniſſa, was inſulted by Cæſar; and in conſequence of this, the African prince adhered cloſely to the Pompeian faction, gained ſome advantage over one of Cæſar's lieutenants, and reduced Cæſar himſelf to great extremities. At length Cæſar overthrew Scipio, Juba, and Labienus, and by a deciſive action made himſelf maſter of Numidia, which he reduced to a Roman province. See MAURITANIA.

NUMIDIA, Pintado, in *Ornithology*, a genus of birds of the order Gallinæ. The generic character is this; the bill is ſtrong and ſhort, the baſe of it covered with a carunculate cere receiving the noſtrils; the head is horned, with a compreſſed coloured callus; tail ſhort, bending down; the body is ſpeckled. There are four ſpecies comprehended in this genus, of which the moſt intereſting is the Meleagris; we ſhall, however, deſcribe them all.

### Species.

MELEAGRIS; the Guinea Hen. There are three varieties of this ſpecies. In the *firſt*, the caruncles at the gape are double; in the *ſecond*, the breaſt is white; and in the *third*, the body is entirely white. It is an inhabitant of Africa, and is domeſticated in moſt parts of Europe; is about 22 inches long, and makes a harſh unpleaſant cry. The bill is of reddiſh horn colour; the head is blue; the crown conic, compreſſed, with a blueiſh-red protuberance; the upper part of the neck is of a blueiſh-aſh, almoſt naked; the lower part is feathered, verging to violet; the body is black, with round white ſpots; the legs are grey-brown; and the gular caruncle of the male blueiſh, female red. The meleagris is noiſy, reſtleſs, and turbulent, continually moving from place to place, and domineering over the whole poultry-yard. The turkey, though twice its ſize, is in continual apprehenſion from its petulance. The birds of this genus ſeem in many reſpects to reſemble the common poultry. Like them, they ſcratch the ground, and go in large flocks, feeding their young and pointing out their food. In the Cape de Verde iſlands ſeveral hundreds are ſometimes ſeen together; here the inhabitants hunt them with dogs; and, as their flight is heavy, whenever they are run down they are eaſily killed or caught. The male and female ſo nearly reſemble each other, that they can hardly be diſtinguiſhed; the only difference is, that the wattles, which are blue in the former, are inclining to red in the latter. Pintados, as has been obſerved, were originally from Africa, and were known under the name of Numidian hens.

hens. They are more commonly domeſticated in thoſe countries that border on the Mediterranean than with us. In our climate, which is evidently too cold for them, they are neither fertile, nor eaſily reared, and are kept rather for ſhow than uſe. In countries adapted to their nature, the female lays a great number of eggs, which ſhe endeavours to ſecrete, till ſhe has produced her young brood. The eggs are ſmaller than thoſe of a common hen, and of a rounder ſhape. They are reckoned very fine food. During the night, the Guinea-fowl perches on high places, and if diſturbed, alarms the neighbourhood by its unceaſing cry. In its natural ſtate of freedom it prefers marſhy places. It is eaſily tamed, but often abandons its young. An hybrid race has been produced between theſe birds and our common poultry, but, as is uſual, it ſeems incapable of reproduction.

MITRATA; the Mitred Pintado. Caruncles at the gape double; the gular fold is longitudinal. It inhabits Madagaſcar and Guinea; and is the ſize of the laſt.

CRISTATA; the Creſted Pintado. This has no caruncle; on each ſide the gape is a longitudinal fold. This is a native of Africa.

ÆGYPTIACA; the Egyptian Pintado. This is black, ſpotted with blueiſh; the crown is creſted; head and neck rufous.

NUMISMATOGRAPHIA, a Greek term uſed for the deſcription of ancient medals and coins, whether of gold, ſilver, or braſs.

Fulvius Urſinus, Ant. Auguſtinus, biſhop of Saragoſſa, Erizzo, a noble Venetian, and Sambucus, a Poliſh gentleman, have all ſucceeded in the numiſmatographia. Nor muſt the more modern authors on the ſame ſubject be omitted, *viz.* the two Mezzabarbs, Patin, Spanheim, Hardouin, Morel, Vaillant, Joubert, Baudelot, Beger, and, among ourſelves, Evelyn.

NUMISMATOLOGY, NUMISMATICS, terms uſed for the ſcience which treats on COINS and MEDALS, to which articles the reader is referred. We add, however, in this place, a ſhort account of a few of the moſt celebrated *public* collections, not touched upon in the above articles.

The *Hunterian collection*, which is now in the poſſeſſion of the univerſity of Glaſgow, to which it was bequeathed by Dr. Hunter's will, is one of the moſt celebrated in Europe. The foundation of this collection was laid in the year 1770, from thoſe of the Rev. Mr. Dawes and Thomas Sadler, eſq. The next year added much to the ſtock from various cabinets, particularly that of Iſaac Jamineau, his majeſty's conſul at Naples. Mr. Sainthill, ſurgeon, in 1772, the prince of Peralta, and Mr. Weſt in 1773, continued to enrich Dr. Hunter's cabinet. In 1776, the Egyptian coins were much increaſed from the collections of Mr. J. Bruce, and Mr. C. Lindegreene, a Swede, who had reſided in Egypt. Mr. Dorana added his collection to Dr. Hunter's in the ſame year, and it contained the accumulated treaſures of many elegant ſcholars and eminent antiquaries. At the ſame time, Mr. White ſupplied, from his muſeum, thoſe coins which were wanting in Dr. Hunter's; and, as if this year was to be diſtinguiſhed by the value of the acquiſitions, and the characters of the benefactors, Dr. Ruſſell ſupplied thoſe deficiencies which his ample collection enabled him to diſcover. The year 1777 furniſhed ſtill additional ſtores from Dr. Combe, a foreign noblemen, Mr. Swinton, Mr. J. Smith, the Rev. Dr. Eyre, and Mr. Samuel of Lincoln, and from numerous other benefactors. In the year 1782, Dr. Combe publiſhed his "Nummorum veterum Populorum et Urbium qui in Muſeo Gulielmi Hunter aſſervantur Deſcriptio;" a highly uſeful work, in which the Greek and Roman coins of the collection are arranged according to the different cities in which they were ſtruck.

Of the very rich collection of coins and medals in the *Britiſh Muſeum*, we are as yet without a deſcriptive work; part of which will, however, ſoon be preſented to the public. The following ſhort account is from the "Synopſis" of the contents of that celebrated repoſitory. This collection, the baſis of which was formed by the cabinets of ſir Hans Sloane and ſir Robert Cotton, has been from time to time enlarged by many valuable purchaſes and donations, but principally by the munificent bequeſt of the Rev. C. M. Cracherode. It is comprehended under the three following heads. 1. Ancient coins. 2. Modern coins. 3. Medals. The firſt of theſe heads conſiſts of Greek and Roman coins. The Greek coins are arranged in geographical order, and include all thoſe which are ſtruck with Greek characters, in Greece, or elſewhere, by kings, ſtates, or cities, which were independent of the Romans. With this claſs are placed, likewiſe, the coins of free ſtates and cities, which made uſe of either the Etruſcan, Roman, Punic, Spaniſh, or other characters. The Roman coins are placed, as far as it can be aſcertained, in chronological order. They conſiſt of the *As* in its diviſions; family or conſular coins; imperial coins ſtruck in Rome; imperial coins ſtruck in Egypt; imperial coins ſtruck in the Roman colonies; imperial coins ſtruck with Punic characters; contorniates.

The ſecond head, compriſing modern coins, conſiſts of Anglo-Saxon, Engliſh, Anglo-Gallic, Scotch, and Iriſh coins, and likewiſe the coins of foreign nations. This claſs is arranged according to the reſpective countries to which the coins belong, thoſe of each country being kept ſeparate.

The third head, which compriſes a claſs conſiderably more modern than either of thoſe which precede it, conſiſts of medals ſtruck in our own country, and of thoſe which have been ſtruck abroad. Theſe are arranged in the ſame manner as the modern coins.

The collection of the late king of *France*, now called the Imperial collection, preſerved in the National library of Paris, is by far the greateſt in Europe. The conſiderable treaſures formerly collected by Boze, the Marechal d'Etreés, Séguin, Patin, and in more modern times by Pellerin, are now all incorporated with that moſt valuable collection. Its baſis was formed by Louis I. at Fontainebleau: Henry II., Louis XIII., and particularly Louis XIV., have increaſed its treaſures with royal munificence; and the laſt of the juſt mentioned monarchs cauſed the large medals of this cabinet to be engraved by de la Boſſière. Beſides the above mentioned private collections, this cabinet acquired, in 1793, the *Cabinet de Ste. Geneviève*, at Paris; ſome years after it was increaſed by the antique coins of the Stadtholder, and in 1798, by the collection of the Vatican, the collection which formerly belonged to queen Chriſtina of Sweden, the medallions from the collections of cardinals Carpegna and Albani, &c. (See Hiſtoire abrégée du Cabinet des Medailles et antiques de la Bibliotheque nationale, par A. L. Cointreau, 1800.) An idea of the value of the preſent collection may be formed by the valuation made of it above forty years ago, which amounted to no leſs than ſix millions of livres. The *Cabinet de Ste. Geneviève*, which, having been threatened by robbers in 1793, was removed to the National library, and incorporated with the great collection, has been deſcribed by Claude du Molinet in 1692.

The celebrated imperial collection of coins at *Vienna*, if we except that of Paris, ſtands unrivalled among the cabinets of the continent. It was begun by the emperor Ferdinand I., and ſoon conſiderably increaſed by the acceſſion of other collections, ſuch as that formed by the archduke Albert, under

under the direction of the Chiflets; and the moft valuable collection formed by the archduke Ferdinand at Ombras in Tyrol. It was afterwards confiderably added to by the collections of the learned monarchs Maximilian I. and Rudolph II.; but particularly by the zeal of the emperor Charles VI., who was himfelf a great lover of numifmatology, and who purchafed the cabinets of the Carthufians at Rome, together with that of count Parr. In the reign of Maria Thereſa it was farther increafed by the purchafe of the Granelli collection. Several years ago, the number of coins and medals of this collection amounted to upwards of 40,000, of which about 22,000 were antique. We poffefs a maſterly catalogue of the Vienna collection by the celebrated Joſeph Eckhel, publiſhed as early as 1779, and therefore far from giving a correct idea of the preſent ſtate of that highly valuable repoſitory.

The *Pruſſian* cabinet of medals is conſidered the greateſt in Germany, next to the Imperial collection of Vienna. The celebrated Laurent Beger publiſhed a catalogue of this collection, in three volumes folio, entitled "Theſaurus Brandenburgicus ſelectus, Coloniæ Marchicæ, 1696, 1699, and 1701." Though king Frederic William I. took out a number of large gold coins, (among which was the very large one, eight pounds, or five hundred ducats in weight, bearing the portraits of Frederic William the Great, and his queen,) which were converted into ſmall current money, yet the collection is ſtill richly furniſhed: the number of its antique treaſures has not long ſince been increaſed by 6000 coins from the cabinet of the late margrave of Anſpach; and baron Knobelſdorff, the Pruſſian ambaſſador at Conſtantinople, has tranſmitted many valuable contributions lately diſcovered in thoſe claſſic regions which have been the field of the baron's antiquarian reſearches.

Next in importance among the numiſmatological collections of Germany, is that of *Gotha*, the baſis of which was formed by Erneſt the Pious. It was materially increaſed by the excellent Arnſtadt cabinet of medals, which was formed by Antony Gunther, prince of Schwarzburg, aſſiſted by ſeveral celebrated antiquaries and hiſtorians, ſuch as Andreas Morellus, Chriſtian Schlegel, Olearius, &c. This latter collection was purchaſed, in 1713, by John Frederic, duke of Saxe-Gotha, for the ſum of 100,000 dollars. It is preſerved in ſmall cabinets, each of which is placed on a table, furniſhed below with a ſhelf for books relative to the coins above. This celebrated collection has been at different times conſiderably increaſed by others, ſuch as thoſe of Schachman and Sultzer, that of Mr. Gerning, rich in ſcarce Greek coins, that of baron Seckendorf, &c. The coins in the Gotha collection are ſtill arranged after the old way, by the ſizes and metals, and the ſame mode is adopted in the catalogue, ſeven volumes of which comprize the antique coins as follows: gold coins, kings; coins of cities and free ſtates; coins of families; imperial ſilver; coins of firſt ſize; coins of ſecond and third ſize. There are printed catalogues of the collections of Schachman and Sultzer, which are kept ſeparate. A ſyſtematic catalogue of the whole collection would be very deſirable. There is an old catalogue of the antique coins of the original collection by Liebe (Gotha numaria, ſiſtens Theſauri Fridericiani numiſmata antiqua, 1730, fol.) A hiſtory of the riſe and progreſs of this important cabinet has been publiſhed by Schlichtegroll in 1799.

NUMITOR, in *Biography*, the ſon of Procas, king of Alba, and the brother of Amulius. Procas, before his death, made him and Amulius joint heirs to the crown, on condition of their reigning annually by turns; but Amulius, on getting poſſeſſion of the throne, excluded Numitor, whoſe ſon, Lauſus, he ordered to be put to death, and obliged Rhea Sylvia, Numitor's only daughter, to become a veſtal. This princeſs having become pregnant, declared that ſhe was with child by the god Mars, and afterwards brought forth twins, named Remus and Romulus, who at length killed Amulius, and reſtored Numitor to the throne. This circumſtance occurred in the year 754 B.C.

NUMMES, in *Geography*, a town of Sweden, in the province of Nyland; 20 miles N. of Helſingborg.

NUMMULARIA, in *Botany*. See ANAGALLIS and LYSIMACHIA.

NUMMULARIUS, among the Romans, was uſed to ſignify a banker, or perſon who deals in money.

It likewiſe denoted an aſſayer, or one who eſtimated the goodneſs and value of money, as to its weight and fineneſs of metal.

NUMMUS, or NUMUS, among the Romans, a particular piece of money, otherwiſe called *ſeſtertius*, or *ſeſterce*; which ſee.

This was ſometimes called *nummus ſeſtertius*. *Decem millia numûm & decem millia ſeſtertium*, were Roman ſums, which amounted to the ſame.

NUN, NONNA, the feminine of *Nonnus* or *Domnus*, *quaſi Dominus*, a word anciently uſed for a female religious, and ſtill retained in that ſenſe in our language and in other languages, particularly the French, but by way of ridicule and burleſque. Thoſe of the Benedictine, and certain other orders, have ſtill the abbreviation of Dom affixed to their names. The rule of St. Benedict, drawn up in the 6th century, ordains, "Juniores ſuos priores *Nonnos* vocent, quod intelligitur paterna reverentia."

The word comes from *nonna*, *nonnana*, or *nonnanis*, all Latin terms, firſt uſed for penitents, then for religious. Borel derives it from *nonno*, or *nonna*, which, in Italian, ſignifies *grandfather* or *grandmother*; and adds, that it was applied by way of honour to the woman, as that of *father* to the man, religious.

Nun, or *nonnes*, uſed to ſignify a monk, are of Hebrew extraction, from *nin*, or *nun*, *a ſon*.

Hence alſo *nunnery*, a monaſtery of female religious.

NUN, in *Geography*, a river of Africa, which runs into the Atlantic, N. lat. 4 40'. W. long. 5° 6'.

NUN, or *Vled de Nun*. See VLED *de Nun*.

NUN, in *Ornithology*, the common Engliſh name for the *parus cæruleus*, or blue titmouſe, diſtinguiſhed from the common titmouſe by its ſmallneſs, and by its having its blue head ſurrounded by a white line.

NUN, *White*. See MERGUS *Albellus*.

NUN is alſo the name of a peculiar ſpecies of pigeon, called by Moore the *columba veſtalis*. It is but a ſmall pigeon, but ſometimes larger than the jacobine, and has a very particular plumage, from which it takes its name, its head being as it were covered with a veil.

The body of this ſpecies is all white; the head, tail, and ſix of the flight-feathers black, red, or yellow; the eyes are pear-coloured, and the hood white: this is a large tuft of feathers on the hinder part of the head, and the more numerous they are, the more the bird is eſteemed. This is a very beautiful ſpecies of pigeon, and is very much eſteemed. Some of its feathers, however, will vary ſometimes from their true colour; theſe birds are called foul-feathered: but it is a mere accidental variety, the young of ſuch being often as perfect and beautiful as of any others.

NUNCAR, in *Geography*, a town of Hindooſtan, in the circar of Mahur; 3 miles S.S.E. of Mahur.

NUNCIATION, NUNCIATIO, among the Romans, was particularly

particularly uſed to ſignify the report which the augur made concerning what he had ſeen.

This he did to the chief magiſtrate preſent, and the magiſtrate communicated the ſame to the people, and ſo diſmiſſed the aſſembly, which was called *obnunciation.*

NUNCIO, or NUNTIO, an ambaſſador from the pope to ſome Catholic prince or ſtate; or a perſon who attends, on the pope's behalf, at a congreſs, or an aſſembly of ſeveral ambaſſadors.

The word nuncio has the ſame import with ambaſſador; but is reſtrained, in its uſe, to the ambaſſadors of popes alone; as that of internuncio is to their envoys extraordinary.

The nuncio has a juriſdiction, and may delegate judges, in all the ſtates where he reſides, except in France, where he has no authority, but that of a ſimple ambaſſador.

NUNCUPATIVE, in the *Schools*, a term uſed to expreſs ſomething that is only nominal, or has no exiſtence but in name.

Felix of Urgel maintained, that Jeſus Chriſt, as man, was only God nuncupatively, *i. e.* nominally. Alcuin, in his anſwer to Felix, maintains, that it is to fall into Neſtorianiſm, to diſtinguiſh two ſons of God in Jeſus Chriſt, the one natural, the other adoptive; and two Gods, the one real, the other nuncupative.

NUNCUPATIVE *Will* denotes a laſt will or teſtament only made verbally, or *viva voce*, and not put in writing. See WILL and TESTAMENT.

NUNDAVERAM, in *Geography*, a town of Hindooſtan, in the Carnatic; 8 miles E.S.E. of Udeghery.

NUNDINAL, NUNDINALS, a name which the Romans gave to the eight firſt letters of the alphabet, uſed in their calendar.

This ſeries of eight letters, A, B, C, D, E, F, G, H, is placed and repeated ſucceſſively from the firſt to the laſt day of the year: one of theſe always expreſſed the market-days, or the aſſemblies called *nundinæ*, *quaſi novendinæ*, becauſe they returned every nine days.

The country people, after working eight days ſucceſſively, came to town the ninth, to ſell their ſeveral commodities, and to inform themſelves of what related to religion and government.

Thus, the nundinal day being under the letter A on the 1ſt, 9th, 17th, and 25th days of January, &c. the letter D will be the nundinal letter of the year following. Theſe nundinals bear a very great reſemblance to the dominical letters, which return every eight days, as the nundinals did every nine.

NUNDUNGOTCHY, in *Geography*, a town of Bengal; 10 miles E.S.E. of Bouleah.

NUNDUNGUR, a town of Hindooſtan, in Bahar; 25 miles E.N.E. of Durbungah. N. lat. 26° 12′. E. long. 86° 32′.

NUNDYDROOG, a town and fortreſs of Hindooſtan, in Myſore, the capital of a conſiderable diſtrict, built on the ſummit of a mountain, 1700 feet high, and in moſt parts of it inacceſſible; which was beſieged and taken by the Britiſh troops in 1792; 65 miles N. of Seringapatam.

NUNEATON, a market-town and pariſh in Atherſtone diviſion of the hundred of Hemlingford, county of Warwick, England, is ſituated on the river Anker, at the diſtance of 9 miles N.N.E. from Coventry, and 104 N.W. by W. from London. The river divides the town into two parts; and cloſe to it, on the weſt ſide, paſſes the canal which connects the town of Coventry with the Grand Trunk Navigation. This place was originally ſimply denominated Eaton, ſignifying the town on the rivulet, and ſeems to have been a conſiderable village previous to the Norman era. The addition Nun was derived from the monaſtery for Benedictine nuns, founded here in the reign of king Stephen by Robert Boſſu, earl of Leiceſter, whoſe counteſs, Amicia, took the veil in it, and at her death was buried in the church. Some fragments of the walls of the ancient buildings of this monaſtery are ſtill ſtanding at the north-weſt end of the town; but they are too trifling to convey any idea of the extent or grandeur of the foundation, in the time of its proſperity. No doubt, however, exiſts of its riches and magnificence; as it is recorded to have had large poſſeſſions in different counties, beſides the patronage of ſeveral churches, which were granted to it by pope Boniface and William, earl of Glouceſter. At the diſſolution, it was ſurrendered to the king, who beſtowed the ſcite on ſir Marmaduke Conſtable.

Nuneaton is a town of conſiderable extent, and has been on the increaſe ever ſince the opening of the canal. According to the population returns of 1811, it contained 1101 houſes, and 4947 inhabitants. The market was firſt eſtabliſhed here in the 7th year of the reign of Edward II., by a charter from that prince, granted at the requeſt of the nuns, who were afterwards empowered by ſpecial patent to "take toll of all vendible commodities coming thither by the ſpace of five years, towards the expence of paving" the town. The market is held on Saturday weekly, and there are three fairs during the year. A very conſiderable ribbon manufactory is carried on here. A free-ſchool, founded by the inhabitants in the time of Edward VI., is ſtill ſupported. The church is dedicated to St. Nicholas, and is a very ancient ſtructure, with a ſquare tower at the weſt end, but is not remarkable for its architecture. It contains, however, ſeveral curious monuments, and, among others, that of ſir Marmaduke Conſtable, whoſe death happened in April 1560.

About two miles from Nuneaton the Watling-ſtreet croſſes the northern diviſion of the county, and forms, for ſome miles, the boundary between it and Leiceſterſhire. On this part of its courſe was the ſtation Manduеſſedum, now called *Manceſter*, where many Roman coins of braſs and ſilver have been dug up. The church belonging to this village ſtands on an eminence, ſuppoſed by Stukely to have been the ſcite of an ancient camp, as one ſide of it is deeply entrenched; and to the left of the church are the remains of an ancient fortreſs, or encampment, called Oldbury. It is of an oblong form, and ſurrounded with large ramparts, which incloſe an area of ſeven acres. Dugdale thinks that this work was originally conſtructed and occupied by the Britons, as many ſtone-axes or celts are frequently diſcovered within its boundaries. About two miles to the north-weſt of Nuneaton is Arbury-hall, the ſeat of Francis Newdigate, eſq., who has a coal-mine here, whence a cut is made to the Coventry canal. In the pariſh of Chilvers-Cotton, on the ſame ſide of the town, are the ruins of the monaſtery of Erdburie, which was founded by Ralph de Sudley, in the reign of Henry II., for canons regular of the order of St. Auguſtine. The Antiquities of Warwickſhire, &c. by Sir William Dugdale, 1 vol. folio, London edit. 1656. Camden's Britannia, by Gough, vol. ii.

NUNEGAN, a ſmall iſland in the Frozen ocean. N. lat. 67° 40′. E. long. 193° 40′.

NUNEZ, ALONZO DE CASTRO, in *Biography*, chronicler to Philip IV. of Spain, a writer who lived in the worſt age of Spaniſh literature, and who continued the "Corona Gotica y Auſtriaca," which Diego de Saavedra Faxardo began, and wrote ſeveral other works. Gen. Biog.

NUNEZ, DUARTE DE LIAM, or LEAO, a Portugueſe hiſtorian,

hiſtorian, topographer, and grammarian born in the city of Evora, in the latter end of the 16th century. He wrote upon the origin and orthography of his mother tongue, a deſcription of Portugal, and a diſſertation of the kings of Portugal. His principal works were the "Primeira Parte das Chronicas dos Reis de Portugal, reformadas," corrected and put in order from the chronicle of Fernam Lopez, Recy de Pina, and Duarte Galvam. After the Braganzan revolution, Nunez proceeded with his labours, under the patronage of D. Rodrigo da Cunha, archbiſhop of Liſbon, and he abridged other chronicles of his countrymen. This work appeared in folio, 1643, three years after the Portugueſe had thrown off the yoke of the Spaniards; and no publication could have been better timed than this hiſtory of the glorious and ſucceſsful reſiſtance which their forefathers had made againſt the ſame enemies. In the enſuing year, our author's bookſeller, Antonio Alvarez, printed the original chronicle of Joam I.; and thus the late compilations loſt the greater part of their intereſt. The other originals remained in manuſcript till the year 1790, when the Royal Academy of Liſbon publiſhed them. Gen. Biog.

Nunez, Fernan de Gusman, was born at Valladolid, and became a knight and commendador of the order of Santiago. Notwithſtanding this deciſion with regard to a military life, his inclination led him to letters inſtead of arms. With the view of purſuing literature, he went into Italy, and there ſtudied Greek and Latin under Beroaldus, and Jovian the Greek refugee. As yet Greek learning had not found its way into Spain D. Inigo Lopez de Mendoza is ſaid to have profited greatly by the ſociety of Fernan Nunez, who acted as preceptor to his ſon. When cardinal Ximenes founded the univerſity of Alcala, he and Demetrius the Cretan were appointed Greek profeſſors; and in the famous Polyglot, which, it has been ſaid, would immortalize the name of Ximenes better than all his actions as a ſtateſman, the taſk of preparing a Latin verſion from the Septuagint was entruſted to them and to Lopez de Aſtuniga. Nunez had retired from all the common and unworthy objects of ambition, but his purſuits as a literary man had foſtered in him a love of liberty; and in the ſtruggle which the commons of Caſtile made againſt the growing tyranny, which has ſince been ſo fatal to their country, he lent what aid he could to their efforts, and endeavoured to win the people of Alcala to their cauſe. A young man, to whom he had promiſed great pecuniary rewards for his aſſiſtance, when the inſurgents were ſuppreſſed, attacked him, becauſe this money could not be paid, and wounded him in the arm. The aggreſſor was too powerful, and the cauſe of the diſpute of too ſerious a nature for Nunez to ſeek redreſs: he, therefore, left the univerſity, and removed to Salamanca. Here he was appointed Greek profeſſor, teaching Greek in the forenoon, Latin in the afternoon, and reading lectures upon rhetoric, and upon the natural hiſtory of Pliny. Thus he paſſed the remainder of his life, till the year 1553, when he died, leaving his valuable library to the univerſity of Salamanca. To him has been aſſigned the firſt place among the reſtorers of claſſical learning in Spain. He is highly celebrated by various authors, from ſome of which we ſhall make a ſhort extract or two. Lipſius beſtows on him very high commendation, remarking, at the ſame time, how little his celebrity was proportioned to his deſerts. He deſcribes him, "Non præceps, acutus tamen, et ſagacitate ac modeſtiâ pari." His life, ſays Mr. Southey, ſeems to bear inſpection, as well as his learning; and he is characterized by Nic. Antonio, "Cœlebs, caſtus, comis, feſtivè dicax ſed innocuè, vitiorumque reprehenſor accerrimus." His publiſhed works, beſides the part which he bore in the Polyglot, are, 1. "Annotationes in Senecæ Philoſophi Opera." 2. "Obſervationes in Pomponium Melam." 3. "Obſervationes in loca obſcura et depravata Hiſtoriæ Naturalis C. Plinii, cum retractationibus quorundam locorum Geographiæ Pomponii Melæ, lociſque aliis non paucis in diverſis utriuſque Linguæ auctoribus caſtigatis et expoſitis." 4. "Gloſſa ſobre las obras de Juan de Mena." 5. "Refranes y Proverbios Gloſſados." His occupations and growing infirmities, ſays his biographer, "prevented him from completing this work, as he intended: he was remarkable for the happy uſe of proverbs, and this book would doubtleſs be found of conſiderable uſe to the annotators of Don Quixotte." Gen. Biog.

Nunez, Pero. See Nonius.

Nunez, in *Geography*, a town of Spain, in the province of Cordova; 7 miles N.N.W. of Montella.—Alſo, a river of Africa, called *Nuno*, which ſeparates the Nalos from the Sierra Leone, and runs into the Atlantic, N. lat. 10° 20'. W. long. 13° 50'.

NUNNI, the Grecian lullaby, or ſong peculiar to nurſes. See Song.

NUNNORE, in *Geography*, a town of Hindooſtan, in Bahar, on the Soane; 15 miles S. of Arrah. N. lat. 25° 20'. E. long. 84° 49'.

NUNO Pereira, a ſmall iſland in the Eaſt Indian ſea, near the E. coaſt of Madagaſcar. S. lat. 13° 50'.

Nuno *Triſtao*, a river of Africa, which runs into the Atlantic, N. lat. 9° 40'.

NUNSARA, a town of Hindooſtan, in Guzerat; 16 miles S. of Surat.

NUNTIO. See Nuncio.

NUPER Obiit, in *Law*, a writ which lies for a coheireſs being deforced by her coparcener of land or tenements, whereof their common father or anceſtor died ſeiſed in fee-ſimple.

If the anceſtor died ſeiſed in fee-tail, the coheireſs deforced ſhall have a formedon.

NUPHAR, in *Botany*, νύφαρ of the Greeks, the Yellow Water Lily, or νυμφαια αλλη of Dioſcorides, from the flowers of which was anciently prepared a cooling drink called νυφαρον. The Turks, according to Dr. Sibthorp, ſtill make one of their kinds of Sherbet, or Sorbet, from theſe flowers, which give a kind of bitter almond flavour to the liquor in which they are infuſed. The modern Greeks call the plant νύφαρον, or νενούφαρον, of which its Turkiſh name, *Puſer ciceghi*, ſeems a wide corruption, and the French one, *Nenuphar*, ſcarcely an alteration.—Smith Prodr. Fl. Græc. v. 1. 361. Dryand. in Ait. Hort. Kew. ed. 2. v. 3. 295. (Nymphæa; Lamarck Illuſtr. t. 453. f. 2. Gærtn. t. 19, lutea. Saliſ. in Ann. of Bot. v. 2. 71.)—Claſs and order, *Polyandria Monogynia*. Nat. Ord. *Hydrocharides*, Juſſ. *Nymphææ*, Saliſ. an order intermediate between the *Ranunculaceæ* and *Papaveraceæ* of Juſſieu.

Gen. Ch. *Cal.* Perianth inferior, of five or ſix large, coloured, rounded, concave, permanent leaves. *Cor.* Petals numerous, ſmaller than the calyx, obtuſe, recurved, with nectariferous furrows at their back. *Stam.* Filaments very numerous, inſerted into the receptacle, about as long as the petals, flat, ſpreading; anthers oblong, on the upper ſide of each filament, opening by two linear fiſſures above. *Piſt.* Germen ſuperior, large, ovate; ſtyle none; ſtigma orbicular, peltate, radiated above, its margin entire or notched, permanent. *Peric.* Berry ovate, with a coriaceous coat, internally ſpongy, with numerous cells. *Seeds* very numerous, roundiſh, poliſhed.

Eſſ. Ch. Calyx of five or ſix leaves. Petals numerous, bearing

bearing honey at their backs, inſerted with the ſtamens into the receptacle. Stigma with radiating furrows, ſeſſile. Berry ſuperior, of many cells. Seeds numerous.

1. N. *lutea*. Common Yellow Pond-Lily, or Nuphar. Sm. Prodr. Fl. Græc. v. 1. 361. Ait. n. 1. (Nymphæa lutea; Linn. Sp. Pl. 729. Willd. Sp. Pl. v. 2. 1151. Engl. Bot. t. 159. Fl. Dan. t. 603. Matth. Valgr. v. 2. 246. Camer. Epit. 635. Ger. em. 819. Fuchſ. Hiſt. 536. Nenuphar prima; Brunf. Herb. v. 1. 36.)—Calyx of five leaves. Margin of the ſtigma entire. Footſtalks two-edged. Lobes of the leaves cloſe together.—Native of ponds, lakes, and gentle rivers throughout Europe. Dr. Sibthorp met with it in the lakes of Theſſaly, where it is ſaid by Dioſcorides to grow. It flowers copiouſly with us in June and July. The *roots* are perennial, deeply fixed in the mud, of a firm, almoſt woody, ſubſtance, white and farinaceous within. *Leaves* radical, numerous, floating, elliptical, entire, ſmooth, ſingle-ribbed, with a furrow above; deeply divided at the baſe into two ſlightly angular lobes, which fold over each other. *Footſtalks* various in length according to the depth of the water, two-edged, flat above, convex beneath. *Flower-ſtalks* radical, ſimple, cylindrical, each bearing one *flower*, about two inches wide, raiſed above the water, of an uniform golden yellow in every part, except ſome tints of orange on the *petals*, and of green at the back of the *calyx*. Theſe flowers are vulgarly termed in Norfolk Brandy-bottles, from their ſcent, which partakes of brandy or ratafia. Each ray of the *ſtigma* anſwers to a cell in the *berry*. The *ſeeds* are farinaceous, reſembling millet, but larger.

2. N. *minima*. Leaſt Pond-Lily, or Nuphar. Sm. Engl. Bot. t. 2292. (Nymphæa lutea β, minima; Willd. Sp. Pl. v. 2. 1151. N. parva; Matth. Valgr. v. 2. 247.)—Calyx of five leaves. Stigma toothed. Footſtalks two-edged, nearly flat. Lobes of the leaves rather diſtant.—Diſcovered by Mr. W. Borrer, in the lake of the Highland mountain of Ben Cruachan. Profeſſor Willdenow informs us it has been obſerved in the duchy of Mecklenburgh, as well as in Pruſſia and Bohemia. This is moſt indubitably a diſtinct ſpecies from the laſt, differing not only in its much ſmaller ſize, the *flower* not being above half ſo big, but more eſſentially in its deeply-toothed green-bordered *ſtigma*, and compreſſed *footſtalks*. The *leaves* are ſomewhat ſilky beneath, and their lobes rather diſtant or divaricated.

This may be *Nymphæa lutea minor parvo flore*, Loes. Pruſſ. 178, but it is certainly not *N. lutea minor ſeptentrionalium*, Lob. Ic. 595, which is *Menyanthes nymphæoides*.

3. N. *Kalmiana*. Canadian Pond-Lily, or Nuphar. Ait. n. 2. (Nymphæa Kalmiana; Sims in Curt. Mag. t. 1243. N. lutea β, Kalmiana; Michaux Boreal-Amer. v. 1. 311. N. lutea e Canadâ; Linn. Sp. Pl. 729.)—Calyx of five leaves. Stigma toothed. Footſtalks ſemicylindrical. Lobes of the leaves rather diſtant; their veins furrowed beneath. —Kalm and Michaux have obſerved this in Canada. Meſſrs. Loddiges introduced it here in 1807. We received a ſpecimen from our worthy friend Mr. W. Anderſon, who raiſed it in Mr. Vere's garden at Knightſbridge. This ſpecies flowers from June to Auguſt; and is moſt akin to the laſt in ſize, but the *leaves* are more rounded and obtuſe, their *ſtalks* not flattened, their veins furrowed beneath, and ſomewhat prominent above. *Flowers* of a golden yellow, with a purpliſh, not green-bordered, *ſtigma*, ſimilarly toothed at the edge.

Mr. Anderſon remarks (ſee *Curt. Mag.*) that this, as well as the *lutea*, "beſides the leaves which float upon the water, bears others which never appear above its ſurface; theſe are tenderer, more undulated, and ſhorter, with lobes very much divaricated, and hence approaching to kidney-ſhaped."

4. N. *advena*. Three-coloured Pond-Lily, or Nuphar. Ait. n. 3. (Nymphæa advena; Ait. ed. 1. v. 2. 226. Willd. Sp. Pl. v. 2. 1152. Hort. Berolin. t. 38. Sims in Curt. Mag. t. 684.)—Calyx of ſix leaves, in two rows. Stigma undulated. Footſtalks nearly cylindrical. Leaves heart-ſhaped, with ſpreading lobes. Fruit furrowed.—Native of North America, introduced into England by Mr. William Young, in 1772. It is hardy, flowering in June, as we have ſeen it in ſir Joſeph Banks's pond at Spring-grove, near Hounſlow. This is the ſize of our common *Nuphar lutea*, but the *leaves* approaching towards a triangular form, with diſtant lobes, ſomewhat of a terminal point, and almoſt cylindrical *footſtalks*, diſtinguiſh it. The *flowers* too differ in the dark purple inſide of their three outer *calyx-leaves*, one of which indeed occaſionally, but not always, aſſumes ſome of the dilated form, and yellow colour, of the three inner ones. The *petals* are concealed by the very numerous, recurved, crimſon-bordered *anthers*. The *ſtigma* is yellow, with a wavy, or bluntly crenate, edge. The *berry* is ſaid to be furrowed longitudinally. If this ſpecies was more free in flowering, it would make an agreeable variety in ponds among the common kind.

5. N. *longifolia*. Long-leaved Pond-Lily, or Nuphar. (Nymphæa longifolia; Michaux Boreal-Amer. v. 1. 312. N. ſagittifolia; Walt. Carolin. 155.)—Calyx of ſix leaves in two rows. Stigma undulated. Leaves oblong, wavy, arrow-ſhaped, with abrupt approximated lobes, at the baſe. —Native of North and South Carolina, according to Michaux, whoſe deſcription however accords but ill with a ſpecimen communicated to us by Dr. Delile from that country, by which the *leaves* do not appear to be obtuſe, neither are the *petals* wanting, nor the *anthers* nearly ſeſſile. The *leaf* in ours is near a foot and a half long, and from three to four inches broad, wavy at the edge; its termination, though injured, appears evidently to have been acute; the baſe is extended into two ſmall lobes, one inch and a half long, folding over each other, oblong, angular, and obtuſe. *Flower* nearly the ſize of the laſt. Three outer leaves of the *calyx* green, elliptical; three inner much larger, rounder, almoſt entirely yellow. *Petals* wedge-ſhaped, the length of the outer *ſtamens*, and concealed by them. *Stigma* with numerous elevated rays, its margin ſlightly wavy. All the organs of impregnation are yellow, the *anthers* much paler than the reſt, and almoſt white; their length about equal to the *filaments*, their lobes or cells tumid.

NUPTIAL, ſomething that relates to marriage.

NUR, in *Geography*, a town of Grand Bucharia, ſituated on a mountain, and ſo called from *Nur*, light, becauſe it contained a number of holy places, whither devotees reſorted: it was taken by Jenghiz Khan in 1211; 100 miles N.E. of Bokhara. N. lat. 40° 15′. E. long. 63° 50′.—Alſo, a town of the duchy of Warſaw; 50 miles E.N.E. of Warſaw.

NURA, a river of Ruſſia, which runs into the Kargaldzin lake, N. lat. 51° 44′. E. long. 68° 44′.—Alſo, a river of Italy, which runs into the Po, 6 miles N.E. of Piacenza.

NURABAD, a town of Hindooſtan, in the circar of Gohud; 20 miles W. of Gohud.

NURAQUIMIRE, a town of Hindooſtan, in the province of Tatta; 48 miles S.S.E. of Tatta.

NURDIJA, a town of Perſia, in Khoraſan; 30 miles S. of Neiſapour.

NUREMBERG, an imperial city of Germany, in the circle of Franconia, anciently called "Mons Noricorum," made free by the emperor Frederic Barbaroſſa. It is large and well built, though not populous, ſituated on a ſandy ſpot, well cultivated and fertile, and rendered pleaſant by the villages and country ſpots that are adjacent; the river Pegnitz runs through the town, and it is here traverſed by a number of wooden and ſtone bridges. The town is encompaſſed by double walls, fortified by ſeveral towers, and guarded by a ditch of about a German mile in circuit. Its ſtreets are about 500, and its houſes 8000, but the number of inhabitants is very diſproportioned to the extent of the town. The magiſtrates and inhabitants are chiefly Lutherans; beſides two parochial churches, it contains 15 other places of worſhip. The town is divided into 8 parts, and 131 captainſhips; in one of the parts is ſituated the imperial fortreſs, conſtructed in an old-faſhioned ſtyle, and placed on a mountain, where the firſt counſellor, as imperial bailiff and caſtellan, was accuſtomed to reſide. The council-houſe is one of the moſt magnificent in Germany, and in its apartments are ſeveral curious paintings: and the council conſiſts of 34 noble and 8 handicraft counſellors. The military force of the town conſiſts of ſeven companies of foot, and two companies of cuiraſſiers, &c. Several of the inhabitants have acquired conſiderable reputation in the arts of painting and engraving; and many of its artiſts have diſtinguiſhed themſelves by works in ivory, wood, and metal, which are widely circulated. Nuremberg is one of the principal trading towns in Germany. The adjoining territory, called the circle of Nuremberg, is conſiderable; 78 miles E.S.E. of Mentz. N. lat. 49° 28′. E. long. 11° 1′.

NURHUA, a town of Hindooſtan, in Bahar; 28 miles N.W. of Chuprah. N. lat. 26° 0′. E. long. 84° 20′.—Alſo, a town of Hindooſtan, in Bahar, on the Dewah; 50 miles N.W. of Patna.

NURI, a town of New Mexico, in the province of Hiaqui; 40 miles S.E. of Riochico.

NURJEE, a town of Seweſtan; 25 miles N. of Schwan.

NURMIJARVI, a town of Sweden, in the province of Nyland; 20 miles N.N.W. of Helſingfors.

NURMIS, a town of Sweden, in the government of Kuopio; 58 miles N.E. of Kuopio.—Alſo, a ſmall iſland, on the E. ſide of the gulf of Bothnia. N. lat. 61° 12′. E. long. 21° 10′.

NURMO, a town of Sweden, in the government of Waſa; 36 miles E.S.E. of Waſa.

NURMS, a town of the duchy of Courland; 28 miles E. of Goldingen.

NURPUR, or NOORPOUR, a town of Hindooſtan, and capital place of a diſtrict, in the ſubah of Lahore. It is ſituated on the top of a hill, which is aſcended by ſome ſteps, and has the appearance of opulence and induſtry. The diſtrict is mountainous; its revenues amount to 40,000*l.*; and it is leſs moleſted than the contiguous principalities by the oppreſſive incurſions of the ſeiks; 70 miles N.E. of Lahore. N. lat. 32° 12′. E. long. 75° 5′.

NURRAH, a town of Hindooſtan, in the circar of Ruttunpour; 20 miles E. of Naypour.

NURSERY, in *Agriculture* and *Planting*, the name of a place appropriated for rearing and preſerving young plants of different kinds. Every gentleman who has any extent of land to be planted ſhould have a place of this ſort for raiſing his young trees and plants, as it ſaves a great deal of trouble and expence which muſt otherwiſe be incurred in providing them.

Mr. Boutcher ſtates, that it is an almoſt univerſally received opinion, that trees ought to be raiſed in the nurſery on a poorer ſoil than that to which they are afterwards to be tranſported for good, and it has been directed by many, otherwiſe the moſt reſpectable authors. He muſt acknowledge this doctrine has a very ſpecious appearance at firſt view. He adhered to it early in life, and it is ſo ſeemingly conſiſtent with nature, that he is not ſurpriſed it has been generally adopted by young planters, at the ſame time he cannot account for thoſe who have had much practice and long experience not expoſing the errors of it. And he adds, that he has given ſome examples, from frequently repeated experiments, of the ill effects he has felt by planting young and tender ſeedlings in the pooreſt ſoils, and the greater ſucceſs attending thoſe that were well-grown on the ſame, or in ſimilar ſituations. The conſequences of raiſing plants on poor hungry land are no leſs fatal than planting the ſeedlings in ſuch, and ſhould as much as poſſible be avoided. He has mentioned in the culture of many trees, the neceſſity of promoting their vigorous growth at firſt, in order to their becoming ſtately and handſome; nor can this be effected by any other means than being early nurſed in a generous ſoil; for whatever future purpoſe they are meant, or to whatever ſituations they are deſtined; and that, if they are but barely ſupported from infancy on meagre ground they will never afterwards become ſtrong, though removed to that which is rich and feeding. Farther, that he has ſown the ſeeds of foreſt trees on the pooreſt ground, planting ſeedlings, and ſtrong well-nurſed trees from ten to five feet high, on the ſame ground and at the ſame time, where the old well cultivated plants have frequently made good trees, when the ſeedlings have periſhed, and from the ſterility and coldneſs of the ſoil, the ſeeds have not ſo much as vegetated. In ſhort, the roots of ſeedlings are not ſo well fitted as larger plants to draw ſufficient nouriſhment from crude, rank, and uncultivated ſoils: and as he has truly found what is here ſaid in many inſtances to be the caſe, he is obliged to believe that the general practice of planting ſeedlings in poor, and large trees in good land, ſhould be quite reverſed.

It has alſo been ſtated by others, that almoſt all writers on agriculture adviſe the farmer to be very careful to make choice of ſuch plants only as have been raiſed in a nurſery of poor ſoil, and always to reject ſuch as have been reared in a richer ſoil than that in which he is to plant them: becauſe, a plant which has been reared in a barren ſoil has been inured, from its infancy, to live hardily, and will advance with a great degree of luxuriance, if it is planted in one that is better: whereas a plant that has been nurſed in a fertile ſoil, and has certainly ruſhed up to a great ſize, like an animal that has been pampered with high feeding, and ſwelled up with fat, will languiſh and pine away, if tranſplanted to a more indifferent ſoil. But it would be no difficult matter to ſhew the fallacy of this mode of reaſoning, and to point out many errors which have crept into almoſt all ſciences, from purſuing ſuch fanciful analogies between objects in their own natures ſo different, as in this example. But as this would be in ſome meaſure foreign to the purpoſe, it may juſt be noticed, that it could ſeldom be attended with worſe conſequences than in the preſent caſe, as it leads to a concluſion directly the reverſe of what is warranted by experience. For it has been found, from reiterated experiments, that a ſtrong and vigorous plant, that has grown up quickly and arrived at a conſiderable magnitude in a very ſhort time, never fails to grow better after tranſplanting, than another of the ſame ſize that is older and more ſtinted in its growth, whether the ſoil in which they are planted be rich or poor: ſo that, inſtead of

recommending a poor hungry ſoil for a nurſery, it would perhaps in all caſes be beſt to ſet apart for this purpoſe the richeſt and moſt fertile ſpot that could be found; and in the choice of plants, always to prefer the youngeſt and moſt healthy, to ſuch as are older, if of an equal ſize. This is given as the reſult of much experience in this buſineſs. And the practical planter ſuggeſts, that ſo much has been ſaid concerning the queſtion, whether a nurſery ſhould be on a ſoil, and in a ſituation correſponding to thoſe on which the trees are ultimately to be planted, that he ſhould deem it unpardonable to paſs the ſubject in ſilence. He briefly delivers his own opinion, ſo that the reader may apply or reject what agrees with, or ſtands oppoſed to his. But he firſt remarks, that experience has taught him that it is only for an extenſive ſcale of planting that the nurſery can be had recourſe to; in other caſes it is no ſaving for a gentleman to rear a nurſery. He confines himſelf to the nurſing of *ſeedlings only* on the ſame principle; and from indiſputable proofs, demonſtrated both by himſelf and others, who have had much experience, made impartial trials for aſcertaining how far it might be to a gentleman's advantage to rear his own nurſery from ſeed. And they have all found it unprofitable, and attended with conſiderable perplexity. A thing not at all to be wondered at, when we reflect on the multiplicity of buſineſs at that ſeaſon moſt critical, for inſuring ſucceſs in this branch. If the ſoil and ſituation whereon the trees are ultimately to be planted be good, or nearly reſemble what is deſcribed below; then, if all other circumſtances concur, he conceives the trees ought to be nurſed on the ſpot; but for no other reaſon than that it is leſs expenſive to carry to a diſtance ſeedling, than tranſplanted trees. But if the ſoil whereon the trees are to be planted be bad, or eſſentially different from that he is about to deſcribe, and if the ſituation be bleak, and expoſed to violent winds, then he ſhould conceive the attempt to rear nurſery plants clean, healthy, and well-rooted, oppoſed to common ſenſe. And after ſtating that great care and attention is requiſite in rearing young plants; that ſome are raiſed with more difficulty than others; it is aſked "are the aſh, the beech, the birch, the elm, the larch, and the oak, reared in *infancy* with equal eaſe? Do they not, if properly treated, all equally flouriſh afterwards on the mountain, in the vale, where ſoil is hardly found, and where it is found in abundance? Do we ſow ſeed in ſand, gravel, clay, the crevice of a rock, on the bleak top of a mountain, or in a fertile vale, with equal expectation of ſeeing it riſe a good plant?"

*Soil proper for.*—That which is ſuppoſed by Mr. Nicol as the beſt ſuited for this purpoſe, is a loam of a middling texture, rather inclining to ſand, neither rich nor poor, from eighteen to twenty-four inches in depth; lying on a free, porous ſubſtratum; as this will be found more generally congenial to the nature of the different foreſt trees than any other ſoil. But there is no general rule without exception. If there be a diverſity of ſoils, and if they do not too nearly approach the extremes of meagre ſterility and exceſſive fertility, ſo much the better, ſince all the kinds do not exactly thrive alike in the ſame ſoil; and an opportunity would thereby be afforded of placing each in that congenial to its nature. The ſcite ſhould neither be high nor low, ſheltered nor expoſed, in any extreme, for the ſame reaſon, *viz.* that it may the more generally anſwer all purpoſes. For a nurſery of this deſcription, nothing can be more eligible than the ſpot which may occaſionally be occupied as a kitchen garden. The pulverization and mellowneſs afforded by the previous growth of various culinary crops, bring the land into the moſt ſuitable ſtate for the raiſing of young trees, and at the ſame time clear it the moſt effectually from vermin, as the grub and other inſects. And in all caſes, it will be adviſable to trench the ground to its full depth, in preparing it for a nurſery; and if neceſſary, to give it a dreſſing with lime, marle, dung, &c. *in compoſt.* Other manure ſhould never be applied to nurſery ground at the time of cropping with timber trees. But at the time of cropping with eſculents, manure, either ſimple or in compoſt, may be applied; as conveniency and the nature of the crop in queſtion ſhall determine. But that the trees ſhould immediately follow a manured culinary crop, is the beſt of all methods; as in that caſe, no manure would be required for the timber crop. He has known an inſtance, where a field was taken in for a nurſery, from an old paſture of rough ſward, and in which myriads of the grub-worm, ſlug, &c. had found an aſylum. It was conceived, that by ſubtrenching, or deeply digging it, the land might be effectually cleaned; and accordingly the field was planted with nurſery plants, without any preparatory crop of grain, &c. But the reſult was, that moſt of the firs, the larches, the elms, the beeches, &c. became a prey to the vermin the enſuing ſeaſon; and their ſtems were found peeled entirely round, about an inch under the ſurface. For this reaſon, it becomes a matter of caution, that a like misfortune be avoided, to take a crop, or crops, of grain, potatoes, turnips, &c. in order to thoroughly cleanſe the ſoil of theſe noxious vermin, before venturing in it the more valuable crop of the nurſery. But, in reſpect to the proper rotation, much muſt be left to the judgment of the operator and exiſting circumſtances. The following example is given on the ſuppoſition that it may be applied, or partly rejected, according to the exigency of the caſe. 1ſt. Vegetables, with manure; winter fallow. 2d. Evergreen and reſinous trees, without manure. 3d. Subtrenched; deciduous trees, ditto, ditto. 4th. Potatoes or turnips, with manure. 5th. Evergreen and reſinous trees, as before, &c.

However, for the extenſive plantations of the duke of Portland, in Nottinghamſhire, where the ſoil is of a light ſandy kind, ſome well-ſituated valley is uſually choſen, as near the centre of the intended plantations as poſſible, for the purpoſe of a nurſery. If this valley is ſurrounded with hills on all ſides but the ſouth, ſo much the better. A piece of ground, conſiſting of as many acres as is convenient for the purpoſe, is fenced about in ſuch a manner as to keep out all noxious animals. At each end of the nurſery large boarded gates are fixed, and alſo a road made down the middle wide enough to admit carriages to go through, which is found exceedingly convenient in removing the young trees from thence to the plantations. After the fence is completed, the ground on each ſide the road is trenched about twenty inches deep, which may be done for about 3*l.* 10*s.* or 4*l.* an acre, according as the land is more or leſs gravelly. It is beſt done in the ſpring, when the planting ſeaſon is over. If after the trenching two or three chaldrons of lime be laid on an acre, the land will produce an excellent crop either of cabbages or turnips, which, being eaten off by ſheep in the autumn, will make the land in fine order for all ſorts of tree-ſeeds: but as the oak is the ſort of tree cultivated in general, this is the method purſued in raiſing and managing that moſt valuable ſpecies.

*Culture of the Plants.*—As ſoon as the acorns fall, after being provided with a good quantity, ſow them in the following manner: Draw drills with a hoe in the ſame manner as is practiſed for peaſe, and ſow the acorns therein ſo thick as nearly to touch each other, and leave the ſpace of one foot between row and row, and between every fifth row the ſpace of two feet for the alleys. While the acorns are in the

ground, great care muſt be taken to keep them free from vermin, which would very often make great havock amongſt the beds if not timely prevented. Let this caution ſerve for moſt other ſorts of tree-ſeeds. As ſoon as the acorns are come up, the beds require only to be kept clean from weeds till they want thinning; and as the plants frequently grow more in one wet ſeaſon where the ſoil is tolerably good, than in two dry ones, where the ſoil is indifferent; the time for doing this is beſt aſcertained by obſerving when the tops of the rows meet; which is done, when that is the caſe, by taking away one row on each ſide the middlemoſt, which leaves the remaining three rows the ſame diſtance apart as the breadth of the alleys. In taking up theſe rows, the workman ought to be careful neither to injure the plants removed, nor thoſe left on each ſide. The reſt of the young oaks being now left in rows at two feet apart, let them again ſtand till the tops meet; then take up every other row, and leave the reſt in rows four feet aſunder, till they arrive to the height of about five feet; which is full as large a ſize as is ever wiſhed to be planted. In taking up the two laſt ſizes, the method is to dig a trench at the end of each row, full two feet deep; then undermine the plants, and let them fall into the trench with their roots entire: the ſame mode is neceſſary with other ſorts of trees, very much of their future ſucceſs depending on this point, of their being well taken up.

But Mr. Nicol does not nurſe trees in general more than two ſeaſons; as they are either one or two years in the ſeminary, according to their kinds, before they come under view; and as the after-treatment for many kinds is the ſame, for the ſake of brevity, he claſſes ſuch as with propriety may be claſſed together, and whoſe culture in the nurſery is ſimilar; particulariſing thoſe only that are of the greateſt importance, and whoſe treatment is materially different. He adviſes that the alder and the birch ſhould remain two years in the ſeminary, and then be removed into nurſery rows. The richeſt and choiceſt ground in the nurſery, provided it be of ſuch ſoil, and in ſuch ſituation as is deſcribed above, ſhould be allotted for them. They are to be planted in lines twelve inches aſunder, and about four inches in line. The roots of the alders may be trimmed a little with the knife. The birches muſt not be touched. And he adds, that whether plants ſhould be put in with the ſpade or ſetting ſtick, is a queſtion frequently agitated. He is of opinion it is a matter of little importance to plants of this age, which method is practiſed, provided either be well performed. The ſize of the roots ſhould determine. But it would certainly be improper to force a large root into a ſmall hole, to the evident detriment of the plant, by its roots and fibres being bundled together in a maſs, without the intervention of mould. It is equally improper to force a plant into a ſlit or gaſh, whoſe ſides, by the operation of making it, are hardened and rendered impenetrable, in a great meaſure, by the tender fibrils for a time, until rain, and the influence of the weather, ſoften them. He, therefore, for the better performance of both methods, would adviſe, 1ſt, for dibbling; that the ground be well broke in the operation of digging or trenching; that whatever is dug be alſo planted the ſame day, that it neither be dug nor planted in too wet or too dry a ſtate; that the hole be made large and looſe by a twitch of the hand; that the plant be juſt ſufficiently faſtened to keep it in proper poſition; and that, at the end of each day's work, the whole be levelled, and the earth cloſed to the ſtems with a ſhort-headed rake: 2d, for laying in with the ſpade; that (inſtead of digging over the ground firſt, and then planting in a ſlit or gaſh, whereby the ſides of the ſlit are hardened, and the roots crowded in,) the digging and planting be both carried on together; that is, turn one furrow farther than where the row is to be placed, cut perpendicularly by the line; place in the plants; turn another furrow to their roots; turn a ſecond, or, if neceſſary, a third furrow; cut and place as before, &c.: treading none, but ſmoothing all with the rake. Farther, the aſh and mountain ſorb ſhould alſo remain two years in the ſeminary. The pooreſt ſoil in the nurſery ſhould be their portion, reſerving better for the kinds to follow. They ſhould alſo be planted in lines twelve inches aſunder, and four in line: the roots of both being moderately trimmed with the knife. The beech and the oak are alſo to remain two years in the ſeminary, and ſhould be planted in good ſoil, in lines fifteen inches apart, and five or ſix in line. Their roots on no account to be trimmed at this time; otherwiſe not one-half of the plants will ſtrike. They ſhould remain for two ſeaſons in this ſituation; at the end of the firſt, let their tap roots be cut at the depth of ſix inches below the ſurface, a perſon cutting on each ſide the row, with a ſpade ſharpened on purpoſe, ſo as to effectually cut the tap root of each plant, with as little injury to the upper part as poſſible, then pointing up the intervals of the rows, levelling all to the ſtems of the plants. It is ſuppoſed, that at the end of the ſecond ſeaſon the plants will have made fibry roots, and be fit for removal to almoſt any ſituation. But, if for any particular purpoſe it be neceſſary to nurſe them longer, in that caſe they ſhould be tranſplanted next ſeaſon into freſh nurſery rows; allowing them a little more room, and ſhortening all roots which have a tendency downwards. The common cheſnut, and the horſe-cheſnut, ſhould alſo ſtand two years in the ſeminary, and any part of the nurſery will ſuit them. They ſhould then be planted in lines fifteen inches apart, and four or five in line. Their roots may be gently pruned. They ſhould ſtand two or three ſeaſons, according to their progreſs in this ſituation. Being chiefly ornamental plants, and deſigned for the leſs untoward ſituations, they are frequently required of larger ſize. If ſo, at the end of the ſecond ſeaſon, they ſhould be moved and planted into rows eighteen or twenty inches apart, and eight or nine inches in line; previouſly ſhortening all the roots that tend downwards, and tapping as adviſed above, for beech and oaks. But the elm, the hornbeam, and the ſycamore, are ſometimes removed from the ſeminary at one, and ſometimes at two years old; he prefers the latter, planting them in lines at twelve inches apart, and four in line. The roots may be gently pruned if needful. And at the end of the ſecond ſeaſon they will be fit for removal to any ſituation, where ſoil to the depth of four inches is found; but if intended for more barren ſcites, they ſhould be removed at the end of the firſt year.

In reſpect to the larch, it ſhould never remain more than one ſeaſon in the ſeminary. Mr. Nicol is convinced of this from having made a variety of experiments for aſcertaining the quickeſt and moſt advantageous methods of rearing this uſeful tree. And the reſult of theſe experiments has proved to his entire ſatisfaction, that a healthy ſeedling of one year, alſo nurſed one year, in moderately good ſoil, having a ſufficiency of room, and kept properly clean of weeds, will, in any ſoil or ſituation wherein it may afterwards be placed, outgrow another of any age within the ſeventh year after tranſplanting. He has planted many of this deſcription, and within that period has meaſured them fifteen feet in height; while thoſe on the ſame ſpot, planted the ſame day, and which were, ſome two, ſome three years nurſed, did not meaſure above twelve feet, nor were ſo ſtraight or beautiful in their forms.

The

The progreſs of this plant, in infancy, has been found to follow in this courſe on all ſoils where he has made the experiment; and theſe have been very different in quality and depth:

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|---|---|
| One-year ſeedling. | One year nurſed. |
| Ditto ditto. | Ditto, removed, and nurſed a ſecond year. |
| Ditto ditto. | Nurſed in the ſame row two years. |
| Two-year ſeedling. | One year nurſed. |
| Ditto ditto. | Ditto, removed and nurſed a ſecond ſeaſon. |
| Ditto ditto. | Nurſed in the ſame row two years. |
| Ditto ditto. | Ditto for three years. |

It is here aſked if this be the caſe, may we not alſo ſuppoſe, that ſince the firſt outgrows the others in infancy, and on good ſoil, it will continue to ſurpaſs them on bad and ſhallow ſoils; ſince, by reaſon of its ſmall ſize, it could be more effectually planted? Whether of the two would be moſt apt to ſuffer by inclement weather, and conſequently ſooneſt get ſtinted? It is, therefore, recommended that the plants be taken from the ſeminary at one year old, and nurſed one year, in rows twelve inches apart, and four in line. If plants of a greater ſize be wanted, they ſhould be moved at the end of one, and nurſed another year, in rows fifteen inches apart, and ſix in line. Beyond this, the larch ſhould never be nurſed. The infant tap roots may be ſhortened a little; but after this they ſhould not be pruned at all in any caſe.

With regard to the Scotch fir and the Weymouth pine, the former, unleſs for the purpoſe of decoration, or where it is wanted for variety, is never nurſed, but taken from the ſeminary at two years old, and then planted out for good. Mr. Nicol approves of this practice, provided the plants ſtand thin in the ſeminary; but otherwiſe they ſhould be nurſed one year in rows a foot aſunder, and an inch in line. If they are required of a larger ſize, they ſhould be removed from this into other nurſery lines, at twelve or fifteen inches apart, and four or five in line, according to the time they are to remain there, which, however, ſhould not be longer than two years for any purpoſe whatever. The Weymouth pine ſhould alſo ſtand two years in the ſeminary, and then be nurſed two or three years in rows; according to the purpoſe intended, or the quality and depth of ſoil wherein it is afterwards to be planted. In either caſe, fifteen inches between the lines will be ſufficient; and if they are to remain two years, four in line; but if three, five or ſix. The tap roots of the ſeedlings of either may be ſhortened a little; but at the ſecond, or any ſubſequent removal, their roots muſt not be touched.

But the common or Norway ſpruce ſhould be removed from the ſeminary at two years old, and nurſed in lines twelve inches apart, and three in line, for two ſeaſons: at the end of which, remove them into other lines fifteen inches apart, and four or five in line; there to remain one, or, at moſt, two years, in proportion to their progreſs, or the ſoil they are to be planted in. If they are intended for very barren ſcites, plants nurſed for two ſeaſons *only* are to be preferred. The roots of this plant ſhould not be pruned at any time, if it can be avoided; nor indeed ſhould any of the reſinous tribes, except a ſmall bit of the tap roots of ſeedling infants. The American ſpruce, and the ſilver fir, are alſo to be taken from the ſeminary at the end of the ſecond year, and planted in lines twelve inches apart, and four in line; nurſing them there for two ſeaſons, and then removing them into other lines, eighteen inches apart, and ſix in line, there to remain for one or two ſeaſons more, according to circumſtances. Longer they ſhould not be nurſed. If they are intended for bleak expoſures and barren ſoil, they ſhould be removed thereto at the end of the two firſt ſeaſons of nurſing, if poſſible.

In regard to the quick or white thorn, which is a moſt uſeful plant, it may remain either one or two ſeaſons in the ſeminary, according to the progreſs it may have made; then planting in lines twelve inches apart, and two in line: at the end of one ſeaſon, removing the plants into other lines, twelve inches apart, and four in line. The roots may be gently pruned.

It is obſerved, that "the reaſon of removing them at the end of the firſt year, is to encourage the progreſs of their fibry roots. At the end of the ſecond, they will be fit for *hedging* in any ſituation whatever; nor will plants of any age or ſize outgrow them within the third year, if they are properly kept clean afterwards, as he has proved by repeated experiments made impartially on very different ſoils, ſituations, and expoſures.

*Seaſon of Planting.*—For the deciduous kinds, from the middle of February to about the 20th of March is conſidered the moſt eligible ſeaſon; and for the evergreens, from the 20th of July to about the middle of Auguſt; taking advantage of wet or cloudy weather, and frequently watering in hot, dry weather, till the plants have ſtruck root perfectly.

And the plants of all deſcriptions ſhould be carefully kept clean of weeds in the ſummer months; and the interſtices of all the rows, which ſtand over year, be pointed in with a narrow ſpade, in any of the winter months, being careful not to injure the roots of the plants in the operation. And in reſpect to pruning, the evergreens muſt not be touched, unleſs they put forth rival ſtems or leaders; in which caſe, the weakeſt muſt be diſplaced. The larch is to be treated in the ſame manner. All branches of the deciduous kinds, which ſeem to rival the ſtem in ſize, or take upon them the office of leaders, are to be cut clean off by the bole with a ſharp knife. This is the general management, which is neceſſary to be noticed here. Se PLANTING.

NURSERY, in *Gardening*, a portion of ground ſet apart for the raiſing and nurſing various ſorts of trees, ſhrubs, and herbaceous plants, to proper ſtates of growth, for ſupplying the different gardens, orchards, plantations, and other departments.

In theſe ſituations are raiſed all the different ſorts of fruit-trees, and fruit-bearing ſhrubs, by nurſing and training them up to proper ſizes and growths for planting, where they are to remain to produce their fruit; as well as the vaſt train of foreſt trees, hardy ornamental trees, and deciduous evergreen ſhrubs; training them up properly for the purpoſes for which they are deſigned in plantations and pleaſure-grounds.

And various ſorts of hardy herbaceous plants, both of the fibrous, bulbous, and tuberous-rooted kinds, may be here provided in proper ſtates for being planted out.

Theſe different ſorts of plants are raiſed by ſeed, ſuckers, layers, cuttings, ſlips, offsets, parting the roots, grafting, budding, &c. as directed under their ſeveral heads.

And as ſome of the various ſorts are drawn off annually, to ſupply different ſituations, a freſh ſupply of young plants ſhould be accordingly raiſed every year in the nurſery, of moſt of the various kinds, ſo as to have it always fully ſtocked with moſt kinds in different ſtates of growth: ſome in ſeed-beds, others tranſplanted in nurſery rows; ſome one year, others two, three, or ſeveral years; all of which ſhould be

be well attended to, that there may be a ſufficiency of plants of all ſorts, for furniſhing every different department of gardening, as they may be wanted.

In public nurſery-grounds it is cuſtomary to have convenient green-houſes, glaſs-caſes, and ſtoves, with their proper appendages, for raiſing tender exotics from the warmer parts of the globe, which are always placed in the warmeſt and moſt ſunny ſituations, having their fronts directly facing the ſouth, to have all poſſible benefit from the ſun's influence; which ſerve for raiſing and nurſing the various tender plants to a proper growth, for furniſhing other larger conſervatories, green-houſes, &c.

*Size, Soil, and Situation.*—In reſpect to the extent or dimenſions of nurſery-grounds, they ſhould be according to the quantity of plants required, or the demand for ſale. If for private uſe, from a quarter or half an acre to five or ſix may be proper, which ſhould be regulated according to the extent of the garden-ground and plantations they are required to ſupply; and if for public or general cultivation, not leſs than three or four acres of land will be worth occupying, and from that to fifteen or twenty acres, or more, may be requiſite, in proportion to the demand.

The ſoil for nurſery-grounds ſhould be of different qualities, in order that it may ſuit different ſorts of trees and plants.

Nurſerymen generally prefer a loamy ſoil of a moderately light nature: however, they may be formed of any good moderately light land, that has fifteen or eighteen inches deep of good working ſoil; but if two or three ſpades deep, it will be the better; and where there is ſcope of ground to chooſe from, that where there is a good depth, and a naturally rich or good ſoil, ſhould be preferred, as the ſoil of a nurſery cannot be too good, notwithſtanding what has been advanced to the contrary; as where the ſoil is poor and lean, the plants are moſtly languid, weak, and ſtunted, no art being able to improve them; while thoſe raiſed in a good mellow ſoil always aſſume a free growth, and advance with ſtrength and vigour. It is not requiſite, however, that the ſoil ſhould be very rich, nor over-manured; a medium between the two extremes is the moſt proper, ſuch as mellow paſture land, having the ſward turned to the bottom, which is excellent for the growth of trees: and any ſimilar eligible ſoil of corn-fields is alſo extremely proper; any other good ſoil, of the nature of common garden-earth, is likewiſe well adapted for a nurſery-ground.

As to ſituation, where it is rather low than high, it is better, as being naturally warmer, and more out of the power of cutting boiſterous winds than a higher ſituation; though, where ſome parts of the ground are high, and others low, it may be an advantage, in better ſuiting the nature of the different plants. It is alſo of advantage to have nurſery-grounds fully expoſed to the ſun and free air, and, if poſſible, where there is the convenience of having water, for the occaſional watering of young ſeedlings, and newly removed plants.

When for private uſe, where there is room, nurſery-grounds may either be entirely detached, or contiguous to the outer boundaries of the ſhrubbery plantations of the pleaſure-ground; and ſo contrived as to lead inſenſibly into it by winding walks, ſo as to appear part of the garden or ſhrubbery.

*Method of incloſing, preparing, and laying out.*—In reſpect to the outſide fence, it may either be a hedge and ditch, or a paling. The former is the cheapeſt, and moſt durable; though, where hares and rabbits abound, paling fences are moſt eligible.

Paling, or other ſimilar cloſe fence, is, however, in general, for ſome part, extremely uſeful to train young wall-trees to a proper growth for garden-walls, &c.

After being thus fenced in, the ground ſhould be all regularly trenched over one or two ſpades deep, according to the natural depth of the ſoil: after which, proceed to divide it by walks into quarters, and other parts; letting a principal walk lead directly through the middle, or ſome principal part, which may be from five to eight or ten feet wide, according to circumſtances, having a broad border on each ſide. Another walk ſhould be carried all round, next the outward boundary, four or five feet wide, leaving an eight or ten feet border next the fence all the way; dividing the internal part by ſmaller croſs-walks, ſo as to form the whole into four, ſix, or eight principal diviſions.

One or more of theſe diviſions ſhould be appropriated for the reception of all ſorts of ſeeds, for raiſing plants to furniſh the other parts; ſubdividing it into four-feet wide beds, with foot-wide alleys at leaſt between bed and bed. In theſe beds ſhould be ſown ſeeds, &c. of all ſuch trees, ſhrubs, and herbaceous plants, as are raiſed from ſeed; and which ſhould contain the various ſorts of kernels and ſtones of fruit, to raiſe ſtocks for grafting and budding upon, as well as the ſeeds of foreſt trees, ornamental trees, ſhrubs, &c. and of numerous herbaceous perennials, of the fibrous and bulbous-rooted tribes.

The ſeaſon for ſowing is both ſpring and autumn, according to the nature of their different ſorts, as may be ſeen under their different heads. When the young tree and ſhrub ſeedling-plants, thus raiſed, are one or two years old, they ſhould be planted out in nurſery-rows, into the other principal diviſions; but many kinds of herbaceous plants require to be pricked out from the ſeed-beds, when only from two to three or four months old; and, on the contrary, moſt kinds of bulbous ſeedlings will not be fit for planting out in leſs than one or two years, at the ſhorteſt periods.

Another part of theſe grounds ſhould be allotted for ſtools of various trees and ſhrubs, for propagation by layers, by which vaſt numbers of plants of different kinds may be raiſed. Theſe ſhould be ſtrong plants, ſet in rows three or four feet diſtance every way: ſuch of them as naturally riſe with tall ſtems, after being planted one year, are headed down near the ground, to force out many lower ſhoots conveniently ſituated for laying them down. See STOOLS and LAYING.

The cuttings, ſuckers, ſlips, offsets, &c. of hardy trees, ſhrubs, and plants, may be planted out in any convenient part of the ground, in ſhady borders, &c.; but for the more tender kinds, ſome warm ſheltered ſituation ſhould be provided.

The other principal diviſions of theſe grounds ſhould be left for the reception of various ſorts of ſeedling plants from ſeminary quarters, as well as for thoſe that are raiſed from ſuckers, layers, cuttings, &c. to be planted in rows from one to two or three feet aſunder, according to their natures and growths; allowing the tree and ſhrub kinds treble the diſtance of the herbaceous perennial ſorts. Of the tree and ſhrub kinds, ſome are to be planted for ſtocks to graft and bud the ſelect ſorts of fruit-trees, and other choice plants upon, that are uſually propagated by ſuch methods; others ſhould be trained up entirely on their own roots, without budding and grafting, as in moſt foreſt and other hardy tree kinds, as well as almoſt all the ſorts of ſhrubs.

It is alſo proper to have ſome dry warm ſheltered ſituation in the full ſun, in theſe grounds, for occaſional hot-beds of dung or tan, for raiſing and forwarding many ſorts of tender or curious exotics by ſeed, cuttings, ſuckers, ſlips, &c. which ſhould be furniſhed with ſuitable frames and

and lights, hand-glaſſes, garden-mats, and other requiſites for that ſort of culture.

*Methods and Times of ſtocking with Plants.*—The particular modes of cultivation are fully explained under the different heads of the plants, and the operations that are neceſſary in raiſing them to the beſt advantage.

As to the ſeaſons for performing the works of ſowing, planting, &c. they are different in different kinds; but the autumn and ſpring are the principal ſeaſons. For planting out, or removing, the principal ſeaſon is about October, and in April for tender kinds, eſpecially the evergreen tribe; but moſt other hardy trees and ſhrubs may be tranſplanted any time in winter, in open mild weather. The nature of the ſoil ſhould, however, be regarded in this buſineſs.

The hardy herbaceous fibrous-rooted plants may be removed almoſt any time, either in autumn or ſpring, and many ſorts even in the ſummer; but for the older or larger plants, the autumn or very early ſpring are the beſt periods, which are the only proper ſeaſons for dividing or ſlipping the roots of all theſe kinds for further increaſe.

And for the bulbous and ſuch tuberous roots, whoſe leaves, like moſt of the bulbous tribe, decay in ſummer, the proper ſeaſon for planting or removing them is the ſpring and ſummer months, when their flower-ſtalks decay, as well as to ſeparate their offsets for increaſe; which may either be planted again directly, or kept out of ground one, two, or ſeveral months; though it is proper to plant the principal part again in autumn, unleſs where retained for ſale, &c.

The ſucculent perennial ſorts may be removed almoſt any time in the ſpring, ſummer, or early autumn; but the laſt is the beſt. But moſt kinds of ſucculent cuttings ſucceed beſt when planted in the ſummer ſeaſon.

*Methods of diſpoſing the Plants.*—In the diſtribution of the different ſorts in theſe grounds, each ſhould be ſeparate: the fruit, foreſt trees, &c. occupying ſpaces by themſelves, nearly together; all the ſhrub kind ſhould alſo be ranged in ſeparate places, allotting ſuitable ſpots for herbaceous perennials and tender plants, defended with yew or privet hedges, or a reed fence, &c. in which may be ſet ſuch plants, in pots, as are a little tender whilſt young, and require occaſional ſhelter from froſt, but not ſo tender as to require to be houſed, as green-houſe plants, &c. And in ſuch places, frames of various ſizes may be placed, either to be covered occaſionally with glaſs-lights, or with mats, to contain ſome of thoſe more choice tender kinds in pots, to be nurſed a year or two, or longer, with occaſional ſhelter, till gradually hardened to bear the open air.

The arrangement of all the ſorts in the open grounds ſhould always be in lines or nurſery rows, as already ſuggeſted, placing the fruit-tree ſtocks, &c. for grafting and budding upon, in rows two feet aſunder, when for dwarfs; but for ſtandards two feet and a half, and a foot and a half in the lines. But as, after being grafted and budded, they become fruit-trees, &c. where they are to ſtand to grow to any large ſize, they ſhould be allowed the width of a yard between the rows. Foreſt-trees ſhould alſo be placed in rows from two to three feet aſunder, and half that diſtance in the rows; varying the diſtance both ways, according to the time they are to ſtand; the ſhrub ſhould likewiſe be arranged in rows about two feet aſunder, and fifteen or eighteen inches diſtant in each line; and as to the herbaceous plants, they may generally be diſpoſed in four-feet wide beds, or large borders, in rows, or diſtances, from ſix to twelve or eighteen inches aſunder, according to their nature of growth, and the time they are to ſtand or remain in them.

By this mode of arrangement, a great number of plants are included within a narrow compaſs, but which is ſufficient, as they are only to remain a ſhort time; and, beſides, they are more regularly kept under proper regulation.

In public grounds of this ſort many kinds of ſeedling-trees and ſhrubs are planted out often in much cloſer rows at firſt than theſe, not only in order to huſband the ground to the beſt advantage, but by ſtanding cloſer it encourages the ſtem to ſhoot more directly upward, and prevent their expanding themſelves much any where but at top, as, for inſtance, many ſorts of evergreens that are of ſlow growth the firſt year or two, ſuch as the pine trees, firs, and ſeveral others, which the nurſery gardeners often prick out from the ſeminary, firſt into four-feet wide beds, in rows lengthways, ſix inches aſunder; and after having one or two years growth here, tranſplant them in rows a foot aſunder, and in a year or two after give them another and final tranſplantation in the nurſery, in rows two or three feet aſunder, as above: theſe different tranſplantings encourage the roots to branch out into many horizontal fibres, and prepare them better for being finally planted out.

The various ſorts of nurſery plants, after being raiſed in ſome of the above methods, are ſometimes pricked out by dibble, in other caſes put in by the ſpade, either by trenches, ſlitting-in, trenching, or holing; and ſome are drilled in by a ſpade or hoe, according to the kinds.

Sometimes young ſeedling-trees and ſhrubs are pricked out from the ſeminary by dibble, ſometimes put in by the ſpade in the following methods; firſt, having ſet a line to plant by, the ſpade is ſtricken into the ground with its back cloſe to the line, and another ſtroke given at right angles with it; then a plant ſet into the crevice made at the ſecond ſtroke, bringing it cloſe up into the firſt-made crevice even with the line, preſſing the mould cloſe to it with the foot; then proceeding to plant another in the ſame way, and ſo on. A ſecond method, for plants with rather larger roots, is to ſtrike the ſpade down with its back cloſe to the line, and then cut out a narrow trench with it cloſe along the line, making the ſide next the line perfectly upright, placing the plants upright againſt the back of the trench cloſe to the line, at the proper diſtances; and as the work proceeds, trimming in the earth upon their roots; when one row is thus planted, the earth ſhould be trodden gently all along cloſe to the plants; and then proceed to plant another row in the ſame manner. Another method of planting out ſmall tree and ſhrub plants is, after having ſet the line as above, to turn the ſpade edgeways to the line caſting out the earth of that ſpit, then a perſon ready with plants, ſetting one in the cavity cloſe to the line, and directly taking another ſuch ſpit, turning the earth in upon the roots of the plant, and then placing another plant into the ſecond cut, covering its roots with the earth of a third ſpit, and ſo on to the end; but ſometimes, when the roots are much larger, holes are made along the line wide enough to receive the roots freely every way, covering them in, as above, as the work proceeds, always preſſing the earth gently with the foot cloſe to the roots, and cloſing it about the ſtems, to ſettle the plants firmly in their proper poſitions.

Fibrous-rooted herbaceous plants are moſtly planted with a dibble, except when the roots are large and ſpreading, or ſuch as are removed with balls of earth; when they are more commonly planted by holing them in with a garden trowel, or ſmall ſpade for the purpoſe.

But bulbous and tuberous-rooted plants, ſuch as lilies, tulips, anemones, ranunculuſes, &c. are commonly planted with a dibble, and many ſorts may be planted in drills drawn with a hoe.

They

They are alſo ſometimes planted by raking or trimming the earth from off the top of the beds from about three to four or five inches deep, into the alleys, then placing the roots in rows upon the ſurface, thruſting the bottoms a little into the ground, and immediately covering them with the earth which was drawn off into the alleys, ſpreading it evenly over every part, ſo as to bury all the roots at an equal depth in the ſoil.

The tender kinds of exotic plants, that require occaſional ſhelter whilſt young, ſhould many of them be potted, in order for moving to warm ſituations in winter, or ſome into frames, &c. to have occaſional ſhelter from froſt by glaſſes or mats, as they may require; hardening them, however, by degrees, to bear the open air fully in the nurſery the year round. And the moſt tender kinds that require the aid of a greenhouſe or ſtove, ſhould all be potted, and placed in their proper ſituations. See GREENHOUSE and STOVE PLANTS.

*General Culture of the Plants.*—In the management of the various hardy nurſery plants, thoſe intended as ſtocks or fruit-trees ſhould have their ſtems generally cleared from lateral ſhoots, ſo as to form clean ſtraight ſtems, but never to ſhorten the leading ſhoot, unleſs it is decayed, or becomes very crooked, in which caſe it may be ſometimes proper to cut it down low in ſpring, to ſhoot out again, training the main ſhoot for a ſtem, with its top entire, till grafted or budded. See GRAFTING, BUDDING, and TRAINING.

But in the culture of the fruit-tree kind, the ſorts deſigned for principal wall-trees, particularly ſuch as peaches, nectarines, apricots, &c. ſhould, when of one year's growth from grafting and budding, be planted againſt ſome cloſe fence, as a wall, paling, reed-hedge, &c. and their firſt graft or bud-ſhoot headed down in the ſpring, to promote an emiſſion of lower lateral ſhoots and branches, in order to be regularly trained to the fence in a ſpreading manner for two or three years, or till wanted to form the head in a regular ſpreading growth, which, in public grounds of this kind, ſhould always be ready in proper training, to ſupply thoſe who may wiſh to have their walls covered at once by ſuch ready trained trees. And a ſimilar training, both for wall and eſpalier fruit-trees, may be practiſed with ſome principal ſorts in the nurſery-rows in the open quarters of the ground, by directing their branches, in a ſpreading manner, to ſtakes placed for the purpoſe.

Standard fruit-trees ſhould only be trained with a clean ſingle ſtem, five or ſix feet for full ſtandards, by cutting off all laterals ariſing below; half-ſtandards ſhould be trained with three or four-feet ſtems, and dwarf ſtandards in proportion, by the ſame means.

The heads of the ſtandards in ſome may be directed by having the firſt immediate ſhoots from the graft or bud, when a year old, pruned ſhort in ſpring to procure lateral ſhoots, in order to form a fuller ſpread of branches, proceeding regularly together from near the ſummit of the ſtems, and thus give a more regular branchy growth to them.

Foreſt-trees ſhould, in general, be encouraged to form ſtraight clean ſingle ſtems, by occaſional trimming off the largeſt lateral branches, which alſo promotes the leading top-ſhoots in riſing ſtraight, and faſter in height, always ſuffering that part of each tree to ſhoot at full length; that is not to ſtop it, unleſs where the ſtem divides into forks, when the weakeſt ſhould be trimmed off, and the ſtraighteſt and ſtrongeſt ſhoots or branches left to ſhoot out at their proper length, to form the aſpiring tops.

The different ſorts of ſhrubs ſhould moſtly be ſuffered to branch out in their own natural way, except merely regulating very diſorderly growths; and ſome ſorts may be trained with ſingle clean ſtems, from about one foot to two or three high, according as may be thought proper. But ſhrubs in general appear the moſt agreeable when permitted to ſhoot out laterally all the way, ſo as to be branchy or feathered to the bottoms of the ſtems.

The fruit-trees in each ſpecies ſhould, as ſoon as grafted or budded, have all the different varieties numbered, by placing large flat-ſided ſticks at the ends of the rows, for which purpoſe the ſpokes of old coach-wheels, or any thing about that ſize, of any durable wood, anſwers very well, painting or marking upon them the numbers, and entering them in the nurſery-book, with the name of the varieties to which the number-ſticks are placed, by which, at all times, a ready recourſe may be had to the ſorts wanted.

And it is uſeful to employ the ſame means to trees, ſhrubs, and herbaceous plants, eſpecially the varieties of particular ſpecies, when they are numerous, ſuch as in many of the flowery tribes; as auriculas, carnations, tulips, anemones, ranunculuſes, &c.

Watering nurſery plants is very requiſite in dry hot weather, in ſpring and ſummer; ſuch as ſeed-beds and tender ſeedling plants, while young, and when firſt planted out, till they have taken good root; alſo occaſionally to new-laid layers and newly planted cuttings in dry warm weather; but as to hardy trees and ſhrubs of all ſorts, when planted out at the proper time, as not too late in the ſpring, no great regard need be paid in this reſpect, as they generally ſucceed very well without.

The next buſineſs is, in every winter or ſpring, to dig the ground between the rows of all ſorts of tranſplanted plants in the open nurſery quarters, a practice which is particularly neceſſary to all the tree and ſhrub kinds that ſtand wide enough in rows to admit the ſpade between them; this work is, by the nurſerymen, called turning-in; the moſt general ſeaſon for which is, any time from October or November until March, but the ſooner it is done the more advantageous it will be to the plants. The ground is to be dug only one ſpade deep in theſe caſes, proceeding row by row, turning the top of each ſpit clean to the bottom, that all weeds on the top may be buried a proper depth. It is a moſt neceſſary annual operation, both to deſtroy weeds, and to increaſe the growth of the young plants.

And in the ſummer ſeaſon, great attention is neceſſary to keep all ſorts clean from weeds; the ſeedlings growing cloſe in the beds muſt be hand-weeded; but among plants of all ſorts that grow in rows wide enough to admit the hoe, it will prove not only moſt expeditious, but, by looſening the top of the ſoil, promote the growth of all kinds of plants. It ſhould always be performed in dry weather, and before the weeds grow large. See HOE and HOEING.

As ſoon as any quarter or part of theſe grounds is cleared from plants, others muſt be introduced in their room from the ſeminary; the ground being previouſly trenched over for the purpoſe, giving it the addition of manure if neceſſary.

It is ſuppoſed by ſome to be of advantage to plant the ground with plants of a different kind from thoſe which occupied it before, but this is probably not very material.

The tender or exotic plants of all kinds that require ſhelter only from froſt whilſt young, and by degrees become hardy enough to live in the open air, ſhould, ſuch of them as are ſeedlings in the open ground, have the beds arched over with hoops or rods, at the approach of winter, in order to be ſheltered with mats in ſevere weather; and thoſe which are in pots, either ſeedlings or tranſplanted plants, ſhould be removed in October in their pots to warm ſunny ſituations ſheltered with hedges, &c. placing ſome cloſe under the

fences facing the ſun, where they may have occaſional covering of mats in froſty weather; others that are more tender being placed in frames to have the occaſional covering either of glaſs lights or mats, &c. obſerving that they are gradually to be hardened to the open ground, and need only to be covered in froſty weather; at all other times they ſhould remain fully expoſed, and, by degrees, as they acquire age and ſtrength, become inured to bear the open air fully, ſo as when they arrive at from two or three to four or five years old, they may be turned out into the open ground.

NURSINGDY, in *Geography*, a town of Hindooſtan, in Bengal; 20 miles E.N.E. of Dacca.

NURSINGPOUR, a town of Hindooſtan, in Gurry Mundella; 35 miles W. of Gurrah.—Alſo, a town of Bengal; 8 miles E. of Doeſa.—Alſo, a town of Bengal; 36 miles S. of Dacca.

NURTINGEN, a town of Wurtemberg, on the Neckar, where an hoſpital was founded in 1481, which is ſaid to be the richeſt foundation in the whole duchy; 14 miles S.E. of Stuttgart. N. lat. 48° 36′. E. long. 9° 25′.

NURTURE, *Guardian for*, in *Law*. See GUARDIAN.

NUS, in *Geography*, a town of France, in the department of the Dora; 6 miles S.E. of Aoſta.

NUSANCE, NOCUMENTUM, in *Law*, is uſed not only for a thing done to the hurt or annoyance of another, in his free lands or tenements, but alſo for the aſſiſe, or writ lying for the ſame.

The word is derived from the French, *nuire, to hurt*.

The word is mentioned anno 22 Hen. VIII. cap. 4. Nuſances are either *public* or *private*: a *public* or *common* nuſance is an offence againſt the public in general, either by doing what tends to the annoyance of all the king's ſubjects, or by neglecting to do what the common good requires: in which caſe annoyances and injuries to ſtreets, highways, bridges, and large rivers; as alſo diſorderly ale-houſes, bawdy-houſes, gaming-houſes, ſtages for rope-dancers, mountebanks, &c. cottages erected ſingly on the waſte, making and ſelling of ſquibs and fire-works, or throwing them about in any ſtreet, eaves-droppers, a common-field, and keeping of hogs in any city or market-town, are held to be common nuſances. A *private* nuſance is when only one perſon or family is annoyed, by the doing of any thing; as where a perſon ſtops up the light of another's houſe, or builds in ſuch a manner, that the rain falls from his houſe upon his neighbour's; as likewiſe the turning or diverting water from running to a man's houſe, mill, meadow, &c. corrupting or poiſoning a water-courſe, by erecting a dye-houſe, or a lime-pit, for the uſe of trade, in the upper part of the ſtream; ſtopping up a way that leads from houſes to lands; ſuffering a houſe to decay, to the damage of the next houſe; erecting a brew-houſe in any place not convenient; or an houſe of office, &c. ſo near another perſon's houſe as to offend him by its ſmell; or exerciſing any offenſive trade, and ſetting up a fair or market to the prejudice of another.

Indictment lies for a *public* or *common* nuſance at the king's ſuit, whereon the party offending ſhall be fined and impriſoned; but no action can be brought in this caſe, except one man ſuffers more by a common nuſance than another; as where a pit is dug in the highway, and he falls into it. Action on the caſe, or aſſiſe of nuſance, lies, for any *private* nuſance, at the ſuit of the party aggrieved, and on ſuch actions judgment is given that the nuſance ſhall be removed, and the injured party recover damages: but if a perſon has only a term of years in a houſe or lands, as he has no freehold therein, he can only have an action on the caſe, by which means the nuſance will be removed without his recovering damages. The continuation of a nuſance is by the law conſidered as a new nuſance, and therefore, where a perſon ſuffers a nuſance to be ſet up, and then alienates and lets the land, &c. without removing it, an action of the caſe lies againſt him who erected it; and alſo againſt the alienee or leſſee, for continuing it. It has been adjudged that any perſon may remove a nuſance, in which caſe, even the cutting down a gate that croſſes the highway is legal; yet if a man deſtroys the nuſance himſelf, before he commences his action, he cannot have it afterwards, nor recover damages. Neither the lord of a manor, nor the king himſelf, can licenſe any perſon to make or erect a nuſance. Manwood makes three kinds of nuſances in the foreſt; the firſt, *common* nuſance; the ſecond, *ſpecial* nuſance; the third, *general* nuſance.

The writ of nuſance, *de nocumento*, is either ſimply *de nocumento*, or *de parvo nocumento*.

Writs of nuſance are now properly termed *treſpaſſes*, and actions upon the caſe.

NUSANCE, *Abatement of*, denotes the removal of it, which the party aggrieved is allowed to do, ſo as he commits no riot in the doing of it. 5 Rep. 101. 9 Rep. 55.

If a houſe or wall is erected ſo near to mine, that it ſtops my ancient lights, which is a *private* nuſance, I may enter my neighbour's land, and peaceably pull it down. (Salk. 459.) Or if a new gate is erected acroſs the public highway, which is a *common* nuſance, any of the king's ſubjects paſſing that way may cut it down, and deſtroy it. (Cro. Car. 184.) The reaſon why the law allows this private and ſummary method of doing one's ſelf juſtice, is, becauſe injuries of this kind, which obſtruct or annoy ſuch things as are of daily convenience and uſe, require an immediate remedy; and cannot wait for the ſlow progreſs of the ordinary forms of juſtice.

NUSANCE, *Aſſiſe of*, is a writ, wherein it is ſtated that the party injured complains of ſome particular fact done, *ad nocumentum liberi tenementi ſui*, and therefore commanding the ſheriff to ſummon an aſſiſe, that is, a jury, and view the premiſes, and have them at the next commiſſion of aſſiſes, that juſtice may be done therein (F. N. B. 183.); and if the aſſiſe is found for the plaintiff, he ſhall have judgment of two things. 1. To have the nuſance abated, and 2. To recover damages. (9 Rep. 55.) This action, as well as that called *quod permittat proſternere*, are now out of uſe, and have given way to the action on the caſe; in which no judgment can be had to abate the nuſance, but only to recover damages.

NUSBERG, in *Geography*, a town of Pruſſia, in Ermeland; 10 miles S.S.W. of Heilſberg.

NUSCO, a town of Naples, in Principato Ultra, the ſee of a biſhop, ſuffragan of Salerno; 8 miles N. of Conza. N. lat. 40° 56′. E. long. 15° 1′.

NUSHAR, a town of Aſiatic Turkey, in the government of Maraſch, at which there is a paſſage over the Euphrates; 55 miles S.W. of Diarbekir.—Alſo, a town of Curdiſtan, at the foot of mount Ararat; 20 miles N.E. of Van.

NUSSERABAD, a town of Hindooſtan, in Candeiſh; 30 miles S.W. of Burhanpour.

NUSSERATPOUR, a town of Hindooſtan, in Baglana; 20 miles N.E. of Chandor.

NUSSERPOUR, a diſtrict or province of Hindooſtan, in Sindy, lying on each ſide of the Indus, between Seweſtan and Tatta.—Alſo, a town of Hindooſtan, and capital of a country of the ſame name, on the Sinde; 30 miles S.W. of Moultan. N. lat. 25° 20′. E. long. 68° 20′.

NUSTAM, a word uſed by Paracelſus and his followers

to expreſs the cream of milk, or the pellicle which in ſome caſes ſwims upon the ſurface of wine.

NUT, in *Botany* and *Vegetable Phyſiology*, *Nux*, a hard and bony ſeed, not opening by valves, uſually conſiſting of but one cell, ſometimes of more, each cell containing one, rarely two, kernels. See SEED.

NUT, *Barbadoes*. See PERIHONES.

NUT, *Bladder*. See STAPHYLÆA.

NUT, *Caſhew*. See ANACARDIUM.

NUT, *Cob*. See HAZEL and CORYLUS.

NUT, *Cocoa*, the name of a genus of plants, called by botaniſts *cacao*. See THEOBROMA. See alſo COCOS.

NUT, *Earth*. See ARACHIS.

NUT, *Fauſel*. See ARECA.

NUT, *Filbert*. See FILBERT and CORYLUS.

NUT, *Hazel*. See HAZEL and CORYLUS.

NUT, *Malabar*. See JUSTICIA.

NUT, *Peas*, which ſome call the *lathyrus* of botanical writers. See LATHYRUS.

NUT, *Phyſic*, a name ſometimes given to the *ricinoides* of Tournefort. See JATROPHA and TURNSOLE.

This is alſo a name ſometimes given to the caſſada, and ſometimes to the croton. See PINEI *Nuclei*, &c.

NUT, *Pig*, a name by which the bulbocaſtanum, or earth-nut is ſometimes called. See BUNIUM.

NUT, *Piſtachia*. See PISTACHIA.

NUT, *Spaniſh*, a name by which ſome call the ſiſyrinchium of botanical writers, or the iris with a double bulb of Linnæus.

NUT, *Vomic*. See NUX *Vomica*.

NUT, *Wall*, the name of a well-known genus of trees, called by Linnæus *juglans*, and by Tournefort ſimply *nux*. See JUGLANS and WALNUT.

NUT-*Cracker*, *Nut-hatch*, or *Nut-jobber*, in *Ornithology*. See SITTA *Europæa*.

NUT-*Cracker*. See CORVUS *Caryocatactes*.

NUT-*Hatch*, the Engliſh name of a bird known among authors by that of *ſitta*; and from its climbing trees in the manner of the wood-pecker, called by ſome, though improperly, *picus cinereus*, the grey wood-pecker. (See SITTA *Europæa*.) This is alſo the name of other ſpecies of *Sitta*; which ſee.

NUT-*Jobber*. See SITTA *Europæa*.

NUT-*Oil*, is the oil of walnuts, preſſed out of the kernels by means of a ſcrew-preſs. This is uſed for the mixing with flake white or other pigments, where the clearneſs of the colour is of great conſequence, and would be injured by the brown hue of linſeed oil.

NUTS *of an Anchor*, in a *Ship*, are two little prominences, appearing like ſhort ſquare bars of iron, fixed acroſs the upper part of the anchor-ſhank, to ſecure the ſtock of it in its place; for which purpoſe there is a correſponding notch, or channel, cut in the oppoſite parts of the ſtock, of the ſame dimenſions with the nuts.

NUTATION, in *Aſtronomy*, a kind of trepidation, or tremulous motion of the axis of the earth; whereby its inclination to the plane of the ecliptic is not always the ſame; but varies backwards and forwards ſome ſeconds: and the period of theſe variations is nine years. This nutation was diſcovered by Dr. Bradley, who publiſhed an account of his diſcovery in the year 1737. He alſo diſcovered the cauſe of this phenomenon in the Newtonian ſyſtem of attraction.

The firſt principle of that ſyſtem is known to be, that all bodies mutually attract each other in the direct ratio of their maſſes, and in the inverſe ratio of the ſquares of their diſtances. From this mutual attraction, combined with motion in a right line, Newton deduces the figure of the orbits of the planets, and particularly that of the earth. If this orbit was a circle, and if the terreſtrial globe was a perfect ſphere, the attraction of the ſun would have no other effect than to keep it in its orbit, and would cauſe no irregularity in the poſition of its axis; but neither is the earth's orbit a circle, nor its body a ſphere; for the earth is ſenſibly protuberant towards the equator, and its orbit is an ellipſis, which has the ſun in its focus. When the poſition of the earth is ſuch, that the plane of its equator paſſes through the centre of the ſun, the attractive power of the ſun acts only ſo as to draw the earth towards it, ſtill parallel to itſelf, and without changing the poſition of its axis, and this happens at the equinoxes. In proportion as the earth recedes from thoſe points, the ſun alſo goes out of the plane of the equator, and approaches that of one or other of the tropics; the ſemidiameter of the earth, which is then expoſed to the ſun, being no longer equal, the equator is more powerfully attracted than the reſt of the globe, which cauſes ſome alteration in its poſition, and its inclination upon the plane of the ecliptic: and as that part of the orbit, which is compriſed between the autumnal and vernal equinox, is leſs than that which is compriſed between the vernal and autumnal, it follows, that the irregularity cauſed by the ſun, during his paſſage through the northern ſigns, is not entirely compenſated by that which he cauſes during his paſſage through the ſouthern ſigns; and that the paralleliſm of the terreſtrial axis, and its inclination with the ecliptic, will be a little changed. But though the irregularity is now accounted for, we are ſtill at a loſs for the cauſe of its happening in a period of nine years. This difficulty, however, will immediately diſappear.

The ſame effect which the ſun produces upon the earth, by its attraction, is alſo produced by the moon, which acts with greater force, in proportion as it is more diſtant from the equator; now, at the time when its nodes concur with the equinoctial points, its greateſt latitude is added to the greateſt obliquity of the ecliptic. At this time, therefore, the power which cauſes the irregularity in the poſition of the terreſtrial axis, acts with the greateſt force; and the revolution of the nodes of the moon, being performed in eighteen years, it is clear, that in eighteen years the nodes will twice concur with the equinoctial points; and, conſequently, that twice in that period, or once every nine years, the earth's axis will be more influenced than at any other time; ſo that it will have a kind of balancing backward and forward, the period of which will be nine years, as Mr. Bradley had obſerved; and this balancing he calls *the nutation of the terreſtrial axis*. See Phil. Tranſ. N° 406 and N° 485, in vol. xlv. p. 1. &c. and a fuller account of Dr. Bradley's obſervations under the article STARS.

That the moon has the like motion, is ſhewn by ſir Iſaac Newton, in the firſt book of his Principia; but he obſerves, that this motion muſt be very ſmall, and ſcarcely ſenſible.

NUTMEG, *Nux Moſchata*, a delicate kind of aromatic fruit, or ſpice, the fruit of the *Myriſtica*; brought from the Eaſt Indies, and particularly the Molucca iſlands; of which there are diſtinguiſhed two kinds, the *male* and *female*.

The female is that chiefly uſed among us; its form is round or oval, of the drupous kind, and its taſte hot and pungent.

The male is a wild nut, of a longiſh form, and without either taſte or ſmell; yet ſometimes put off, while yet in the fruit, for the female. See MYRISTICA.

The nutmeg is incloſed in a covering, which is fleſhy and

tough; and which by opening at the tip ſeparates into two valves, and diſcovers the "mace," (ſee MACE,) which has a reticulated appearance, and divides into three portions, which cloſely inveſt a ſlender ſhell, containing the ſeed or nutmeg. This is marked on the outſide with many vermicular furrows, within of a fleſhy farinaceous ſubſtance; variegated with whitiſh and bay, and having a cavity at the bottom for the embryo. The nutmeg tree yields three crops annually; the firſt in April, which is the beſt; the ſecond in Auguſt, and the third in December; yet the fruit requires nine months to ripen it. When it is gathered, the outer coriaceous covering is firſt ſtripped off, and then the inner carefully ſeparated and dried in the ſun. The nutmegs in the ſhell are expoſed to heat and ſmoke for three months, then broken, and the kernels thrown into a ſtrong mixture of lime and water, which is ſuppoſed to be neceſſary for their preſervation, after which they are cleaned and packed up; and with the ſame intention the mace is ſprinkled with ſalt water. There are ſeveral varieties of the tree; but that denominated the Queen nutmeg, which bears a ſmall round nut, is the beſt. They are imported in cheſts, which contain each from 100 to 140lbs. weight; the mace comes alſo in cheſts of different ſizes; the eſſential oil, which is obtained in Banda by diſtillation of the nuts, is brought in bottles, and the expreſſed oil in ſtone jars. Nutmegs are well known, as they have been long uſed both for culinary and medical purpoſes. By diſtillation, or expreſſion, they yield an oil of great fragrancy, and uſe in medicine.

When diſtilled with water, they yield nearly one thirty-ſecond their weight of a limpid eſſential oil, very grateful, poſſeſſing the flavour of the ſpice in perfection, and which is ſaid to have ſome degree of an antiſpaſmodic or hypnotic power: on the ſurface of the remaining decoction is found floating an unctuous concrete matter, like tallow, of a white colour, nearly inſipid, not eaſily corruptible, and hence recommended as a baſis for odoriferous balſams: the decoction, freed from this ſebaceous matter, and inſpiſſated, leaves a weakly bitter, ſubaſtringent extract.

The largeſt and heavieſt nutmegs are to be choſen; ſuch as are of the ſhape of an olive, well marbled without-ſide, reddiſh within, unctuous in ſubſtance, and of a fragrant ſmell.

Alcohol and ether extract the whole virtue of nutmegs by infuſion; and elevate very little of it in diſtillation; hence the ſpirituous extract poſſeſſes the flavour of the ſpice in an eminent degree. When the ethereal tincture, which is limpid and of a golden yellow colour, is evaporated in water, an equal portion of volatile eſſential oil unites with the water, and a white, opaque, granular, ſebaceous ſubſtance, heavier than water, which has much the appearance of the expreſſed oil, is depoſited. When alcohol is digeſted in this ſubſtance, it diſſolves very little of it, but becomes yellow, and acquires the qualities of a ſpirituous ſolution of the eſſential oil. The undiſſolved ſubſtance, if waſhed in water, is nearly inſipid, melts at a temperature of 150°, and on collecting, concretes into a tranſlucent brittle cake, which has the properties of wax. The part of the nutmeg inſoluble in ether is chiefly gum and ſtarch. In diſtillation with water, nutmegs yield $\frac{1}{3\frac{1}{2}}$d of their weight of eſſential volatile oil, and by expreſſion one-third of a ſebaceous fixed oil. Hence, the components of the nutmeg ſeem to be ſtarch, gum, volatile oil, wax, and a fixed fat oil. The volatile oil poſſeſſes the colour and taſte of the nutmeg in a concentrated degree, is of a pale ſtraw colour, limpid, tranſparent, and lighter than water. The expreſſed oil, which is erroneouſly called oil of mace, when firſt drawn, is limpid and yellow, but on cooling acquires the conſiſtence of ſpermaceti, and ſomewhat of the appearance of Caſtile ſoap, being whitiſh, mottled with reddiſh-brown. Its odour is agreeable, and ſlightly aromatic, and its taſte fatty, pungent, and bitteriſh. It appears to be a vegetable cerate, or a triple compound of fixed oil, volatile oil, and wax.

Mace reſembles the nutmeg in its odour and taſte, but has a greater degree of pungency and bitterneſs. It is in laciniated, flexible, thin pieces, unctuous to the feel, and of a deep reddiſh-yellow colour. Alcohol and ether extract its active principles; and when the ethereal tincture is evaporated in water, a thick deep yellow-coloured, very pungent, and odorous oil is left in drops on the ſurface of the water, with ſome reſin; and a ſmall portion of extractive is alſo depoſited, but no waxy granular matter.

Nutmegs, when heated, yield to the preſs a conſiderable quantity of limpid yellow oil, which on cooling concretes into a ſebaceous conſiſtence. In the ſhops we meet with three ſorts of unctuous ſubſtances, called "oil of mace," though really expreſſed from the nutmeg. Beſides the two ſorts, mentioned under the article *Oil of* MACE, there is a third, which is the worſt of all, and uſually called "common oil of mace." This is an artificial compoſition of ſevum, palm oil, and the like, flavoured with a little genuine oil of nutmeg. The medicinal qualities of nutmeg are ſuppoſed to be aromatic, anodyne, ſtomachic, and reſtringent, and with a view to the laſt mentioned effects, it has been much uſed in diarrhœas and dyſenteries. To many people the aromatic flavour of nutmeg is very agreeable; they ſhould, however, be cautioned not to uſe it in large quantities, as it is apt to affect the head, and even to manifeſt an hypnotic power, in ſuch a degree as to prove extremely dangerous. Bontius ſpeaks of this as a frequent occurrence in India; and Dr. Cullen (Mat. Med. vol. ii.) relates a remarkable inſtance of this ſoporific effect of the nutmeg, which fell under his own obſervation; and hence he concludes, that in apoplectic and paralytic caſes, this ſpice may be very improper. The officinal preparations of nutmeg are a ſpirit and eſſential oil, and the nutmeg in ſubſtance roaſted, to render it more aſtringent. Both the ſpice itſelf and its eſſential oil, enter ſeveral compoſitions of the different pharmacopeias of the colleges of London, Edinburgh, and Dublin; thoſe of the nutmeg are "Spiritus myriſticæ," L. E. D. "Spiritus lavendula compoſitus," L. E. D. "Spiritus raphani compoſitus," D. "Confectio aromatica," L. D. "Electuarium catechu," E. D. "Pulvis carbonatis calcis compoſitus," D. "Trochiſci carbonatis calcis," E. D. Thoſe of the oil are "Spiritus ammoniæ aromaticus," D. "Pilulæ ſcillæ," D. "Emplaſtrum picis compoſitum," L. The doſe of the nutmeg and of the mace, is from grs. v. to ʒ j; that of the volatile oil m ij to m vj. Mace poſſeſſes qualities ſimilar to thoſe of the nutmegs, but is leſs aſtringent, and its oil is ſuppoſed to be more volatile and acrid. Lewis. Woodville. Thomſon.

NUTRITION, in *Phyſiology*, a function common to all organiſed bodies, in which their various component tiſſues convert nutritive matter into their own ſubſtance, and add it to the particles which previouſly entered into their compoſition.

The materials of nutrition are prepared by ſeveral previous proceſſes; by *digeſtion*, in which the food is altered in its qualities, and reduced to a homogeneous maſs; by *abſorption*, in which the nutritive part of the aliment is extracted and conveyed into the blood; by *circulation* and *reſpiration*, in which this nutritive matter is converted into blood. (See thoſe articles.) Nutrition is the completion of the functions of aſſimilation; the aliment, animaliſed by the ſeries of proceſſes juſt enumerated, and rendered



ſimilar

ſimilar to the ſubſtance of the being which it is to nouriſh, is applied to the organs, whoſe waſte it is to repair; and this identification of the nutritive matter to our organs, which take it up, and appropriate it to themſelves, conſtitutes nutrition, in which there is a real converſion of the aliment into our own ſubſtance.

The component particles of an animal body are in a ſtate of conſtant change; the old ones are detached and removed by the abſorbents, and their place is ſupplied by new matter laid down by the arteries. Until the body has attained its full ſize, the movement of compoſition predominates over that of decompoſition, and all the parts increaſe; when the growth is completed, and there is no apparent change of bulk, the removed and the added portions balance each other; and, as the body declines, the abſorption exceeds the addition of new matter. But, at all times, there is an interior motion of the component parts. Hence the body has been compared by a French phyſiologiſt to the veſſel of the Argonauts, ſo often repaired in the courſe of a long and perilous navigation, that on her return, no part of her former materials remained. An animal body probably contains none of the ſame molecules at two diſtant periods. The experiments performed by mixing madder with the food of animals, prove moſt unqueſtionably this inceſſant decompoſition of animated and living matter. This mixture, in conſequence of a chemical affinity between the madder and phoſphat of lime, dyes all the bones of a red colour; when the madder is left off for a ſufficient length of time, the colour diſappears. (See Bone.) It is obvious, that the calcareous phoſphat in the oſſeous ſyſtem previous to the commencement of the experiment, muſt be gradually removed, and its place ſupplied by the coloured earth; while this is again abſorbed in its turn, after the madder is diſcontinued, to make room for a new uncoloured depoſition. If the hardeſt and moſt ſolid parts, apparently the moſt calculated to reſiſt decay, are undergoing a perpetual motion of decompoſition and regeneration; there can be little doubt that this motion muſt be far more rapid in thoſe, whoſe power of coheſion is much inferior; for example, in the fluids. In the nails, hair, and cuticle, a conſtant growth is ſo regularly obſerved, that it is not neceſſary to particulariſe the phenomena. The fact is not ſo apparent in the ſoft parts, although we cannot doubt of its exiſtence. The arteries and abſorbents, which they all poſſeſs, can only be ſubſervient to theſe uſes; and we frequently ſee conſiderable enlargement or diminution of the body or a part, when either the addition or abſorption acquires an undue preponderance.

Attempts have been made to determine the period, at which the body is completely renovated; it has been ſuppoſed, that an interval of ſeven years is neceſſary for one ſet of molecules to diſappear and be replaced by others; but this is a point hardly ſuſceptible of any preciſe determination. The change goes on more rapidly in childhood and in youth; it is ſlower in mature age; and muſt require a conſiderable time at a very advanced period of life, when all the organs become firmer, and the vital powers more languid. There can be no doubt that ſex, habit, climate, mode of life, and various other circumſtances, accelerate or retard it.

Theſe conſiderations render it obvious, that the notion of perſonal identity cannot conſiſt in ſameneſs of the body; an animal does not conſiſt of the *ſame* parts in the ſame arrangement, not only at no two diſtant periods, but not in two following days or even hours.

The abſorbing veſſels are the agents of the decompoſition of our organs; they detach the old matter, and convey it into the blood, whence it is ſeparated chiefly by the kidnies, and perhaps alſo by the other ſecretory organs.

The waſte of the conſtituent particles of animal bodies is repaired by means of homogeneous particles exactly like themſelves; thus each organ is the ſame to all appearance, although its component parts have been entirely changed. Were it otherwiſe, the nature of our organs would be undergoing perpetual changes.

This function of reparation is allotted to the circulating ſyſtem, which is a common receptacle for the nutritive fluid extracted from our aliments, and for the materials taken away from all parts of the body by the abſorbing veſſels. The different ſubſtances brought into the circulating ſyſtem are there converted into a homogeneous fluid, of which the compoſition and properties are eſſentially the ſame under all circumſtances. Whether we feed on animal or vegetable matters, on one or on twenty articles, whether the body is increaſing or declining, no differences, or at leaſt none of any conſequence, are obſerved in this fluid; our organs and means of reſearch are not at preſent able to detect the variations of compoſition, which may be reaſonably ſuppoſed to ariſe from the circumſtances juſt enumerated.

From this common nutritive fluid, the blood, conveyed in tubes, which anatomy ſhews us to be every where alike, each organ draws the materials requiſite for its growth and ſupport: bone, muſcle, cartilage, tendon, brain, nerve, &c. convert ſome part of the blood, reſpectively, into thoſe different tiſſues. The proceſs ſeems very ſimilar to that of ſecretion: in the latter, various matters are formed, to anſwer particular purpoſes in the economy, and are then expelled from the body; in the former, the new products drawn from the blood are added to the body, and become identified with its ſtructure. Nutrition muſt be different in the different tiſſues; each appropriating to itſelf whatever it meets with, fitted to its nature, in the fluids conveyed to it, and leaving untouched the remaining heterogeneous particles. Probably there is not much difference in the baſis of all our organs: cellular tiſſue, arteries, veins, nerves, exhalants, and abſorbents, are the common and uniform ground-work. Theſe ſix organic ſyſtems are not found in all the organs, ſome of which have no arteries nor veins, ſome no nerves, &c.: but they meet together in moſt; and there are always ſome preſent, although others may be wanting. The exhalants and abſorbents are the moſt univerſally found: nutrition, reſulting from a double motion, of compoſition, which brings nutritive matter to the organs, and of decompoſition, which removes it, ſuppoſes their exiſtence; the exhalants are the agents in the firſt of theſe motions, the abſorbents in the ſecond. The general ſyſtems above-mentioned conſtitute the nutritive parenchyma of every organ, the mould into which the nutritive ſubſtance is depoſited. The latter, different in every inſtance, conſtitutes the difference of the various organs. It is phoſphat of lime and gelatine in the bones, gelatine only in the cartilages and tendons, fibrine in the muſcles, &c. See the article Fibre.

The nutrition of a part requires a ſupply of arterial blood, the ſource of its materials. Tying the principal artery of a limb does not interrupt this function, becauſe the blood is conveyed through other channels; but a general ligature, impeding the entrance of blood altogether, is followed by death of the part. The influence of the brain and nerves is

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not eſſential to this function. Paralyſed limbs retain their ſize at firſt; but after the lapſe of time, they become ſmaller. See NERVOUS *Syſtem*.

Like all vital proceſſes, nutrition is ſubject to conſiderable varieties. Beſides the modifications, which it exhibits from the progreſs of age, it may be generally increaſed or diminiſhed without any affection of health. In theſe changes, the effect is produced only on particular tiſſues: the bones remain of the ſame ſize, the viſcera are not altered, and probably the muſcles are nearly the ſame; the cellular tiſſue and its contained fat are the parts affected. Exerciſe has the effect of increaſing the ſize of the muſcles.

Numerous deviations from the natural courſe occur in this proceſs under diſeaſe. There may be an exceſſive depoſition of healthy matter in any organ, occaſioning ſwelling or exoſtoſis of the bones, tumours of various parts, &c.; or a morbid matter may be depoſited inſtead of the natural ſubſtance of a part, as in ſcirrhus, ſoft cancer of the teſtis, &c. The laws, which regulate nutrition in the different organs and tiſſues, will be conſidered under the reſpective articles on thoſe ſubjects.

In ſome parts of the body this proceſs does not take place. The hair and nails grow by additions made at one end; and the part, when once formed, undergoes none of the decompoſition and regeneration which have been deſcribed in this article. (See INTEGUMENTS.) The teeth are ſimilarly circumſtanced. (See CRANIUM.) We believe that nutrition goes on in all the other tiſſues.

The amount of what we know about nutrition is ſimply, that the various organic ſtructures of the body form out of the blood, by virtue of their vital properties, muſcle, bone, ligament, brain, nerve, &c. beſides the different products of diſeaſe: the newly formed matters bear no reſemblance to the blood, and are as widely different from each other. To the very natural queſtion, how are theſe changes wrought? we can only anſwer by an avowal of entire ignorance. It has been aſſerted by ſome modern chemiſts, that the proceſſes are chemical; and ſuch they muſt undoubtedly be held, if all the alterations in the component elements of matter fall under the department of chemiſtry. We cannot, however, compare the reſults of nutrition to any of the phenomena ordinarily called chemical. No chemiſt has ever ſucceeded in converting food into chyle, chyle into blood, and the latter into twenty or thirty different matters. Chemiſtry has as yet advanced but little in determining the difference of compoſition between blood and the ſubſtance of our organs: ſtill leſs has it pointed out how each part robs this fluid of its elements, to convert them into its own nature. If we examine vegetable and animal ſubſtances by deſtructive analyſis, we gain very different elements, and are puzzled to underſtand how food of the former kind can furniſh materials for the latter: vegetables may be reſolved into carbon, hydrogen, and oxygen, with ſometimes a ſmall proportion of azote, ſome ſalts, and other materials. In an animal body, azote predominates. The chemical phyſiologiſts have endeavoured to explain how this converſion is effected. But we take the liberty to ſuggeſt that that is not the true problem of nutrition: our inquiry is, how blood is changed into bone, brain, muſcle, &c.; and in proſecuting this inveſtigation, deſtructive analyſis may embarraſs the queſtion, but can hardly afford much aſſiſtance.

Perhaps we are yet hardly acquainted with the extent of the nutritive power. If an animal were ſupplied with food, from which lime and phoſphoric acid were carefully excluded, would the formation of bone go on? In other words, can the exhalant arteries form phoſphat of lime from the blood, if it contains none? Some facts have been aſcertained, which bear analogically on this point; but there is no direct proof either for or againſt it. Dr. Fordyce found, that if the canary bird was not ſupplied with lime, at the time of her laying, ſhe frequently died from her eggs not coming forward properly. He divided a number of theſe birds, at the time of their laying eggs, into two parties: to the one he gave a piece of old mortar, which the little animals ſwallowed greedily; they laid their eggs as uſual, and all of them lived; whereas many of the other party, which were ſupplied with no lime, died. Vauquelin, on the contrary, obſerved, that the oats conſumed in a given time by a hen contained 136.509 grains of phoſphat of lime, and 219.548 grains of ſilica. The ſhells of the eggs, which ſhe laid during this time, contained 98.776 grains of phoſphat, and 453.417 of carbonat of lime. The excrements voided in the ſame time contained 175.529 grains of phoſphat, 58.494 grains of carbonat of lime, and 185.266 grains of ſilica. Conſequently there were thrown out

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| | 274.305 grains of phoſphat of lime. |
| | 511.911 carbonat. |
| | 185.266 ſilica. |
| | 971.482 |
| Taken in | 356.057 |
| Surplus | 615.425 |

We refer the reader to the article GLAND, for our obſervations on ſecretion; to which the proceſs of nutrition bears very great analogy.

NUTRITION *of Plants*. See VEGETATION, SAP, CIRCULATION, PLANTS, &c.

NUTRITION, in *Pharmacy*, an obſolete term which was uſed to denote a kind of preparation, conſiſting in the gradual mixture of liquors of different natures, by ſtirring them together till they have acquired a thick conſiſtence, as in making butter of Saturn, or unguentum nutritum.

NUTRITIOUS *Parts of Plants*, in *Agriculture*, ſuch parts as afford the nouriſhment and ſupport of animals. In this reſpect there is conſiderable diverſity of different ſorts of plants, as well as in the different parts of which they are conſtituted. Dr. Darwin has ſuggeſted that thoſe vegetables, which approach neareſt to the nature of animal bodies, are the moſt likely to ſupply the greateſt proportion of the nouriſhing material. Hence the eſculent muſhrooms, the gluten of wheat or other ſubſtances, and the oils of ſeeds and kernels, may be placed in the firſt rank in this intention. And that as the chyle of all ſuch animals as have red blood, is ſuppoſed to be nearly ſimilar, and to conſiſt chiefly of ſugar, mucilage, and oil; it may be concluded that thoſe vegetables which contain the largeſt proportion of ſuch materials, or of ſuch as are capable of being converted into them by the proceſs of digeſtion, may occupy the next place in reſpect to their nutritive properties, for ſuch animals; provided that no noxious ſubſtances be combined with ſuch uſeful properties, ſo that they cannot be eaſily ſeparated from them. But though this be the caſe with theſe ſubſtances, there are others that may nearly ſupply an equal proportion of nutriment, from their great facility of being changed into ſugar or mucilage, as thoſe which abound in farina, conſiſting of meal or ſtarch, which is partly converted into ſugar, and partly into mucilage, in the proceſs of melting, as well as many others. And the ſap wood or alburnum of moſt trees, it is likewiſe ſuggeſted, affords much nutritious matter in the winter months. This curious

ſubject

ſubject may be ſeen more fully handled in the Phytologia of the above author, where a number of intereſting circumſtances are brought to view on the ſubject.

NUTRITUM, in *Pharmacy*, is a denomination given to a deſiccative, cooling unguent, prepared by the agitation and nutrition of litharge of gold with oil and vinegar, or the juice of ſolanum, in a mortar.

NUTSHED, in *Agriculture*, a provincial term, applied to young animals, to ſignify their being ſtinted or ſtarved in bringing up.

NUTTER MOHR, or *Utter*, in *Geography*, a town of Eaſt Frieſland; 9 miles S.E. of Emden.

NUTUREE, a town of Hindooſtan, in Myſore; 28 miles N.N.E. of Chitteldroog.

NUTWABARA, a town of Bengal; 23 miles N.E. of Ramgur.

NUX, in *Botany*, is not only the Latin name of a particular ſort of feed, (ſee NUT,) but is applied by Tournefort generically, to deſignate the Walnut. See JUGLANS.

NUX *Americana*. See MELICOCCA, QUASSIA, and SAPINDUS.

NUX *Avellana*. See CORYLUS.

NUX *Galla*. See GALL.

NUX *Juglans*. See JUGLANS.

NUX *Malabarica*. See STERCULIA.

NUX *Maris*, in *Natural Hiſtory*, a name given by many writers to a peculiar ſpecies of ſea-ſhell. It is one of the dolium, or concha globoſa kind, and a ſpecies of that genus called gondola.

NUX *Moluccana*, in *Botany*. See JATROPHA.

NUX *Moſchata* and *Myriſtica*. See MYRISTICA.

NUX *Regia*, the *royal nut*, a name given by ſome authors to the *walnut*.

NUX *Veſicaria*. See HERNANDIA and STAPHYLÆA.

NUX *Vomica*, the fruit, or rather the ſeed of the fruit or berry of a large tree growing in ſeveral parts of Egypt, and in the iſlands of Timor and Ceylon; of a ſtrong narcotic quality, ſo as to be ranked in the number of poiſons. This is the tree, called by Plukenet *cucurbitifera Malabarienſis, æopliæ foliis rotundis, fructu orbiculari rubro cujus grana ſunt nuces vomicæ officinarum;* deſcribed and figured in the Hortus Malabaricus under the name of *Caniram*. See STRYCHNOS.

It is round and flat, about an inch broad, and near a quarter of an inch thick, with a prominence in the middle on both ſides, of a grey colour, covered with a kind of woolly matter, but internally hard and tough like horn. The largeſt, whiteſt, neweſt, and cleaneſt are the beſt.

The kernel diſcovers to the taſte a conſiderable bitterneſs, but makes little or no impreſſion on the organs of ſmell. It conſiſts chiefly of a gummy matter, which is moderately bitter: the reſinous part is very inconſiderable in quantity, but intenſely bitter; hence rectified ſpirit has been conſidered its beſt menſtruum.

This drug is ſaid to be an aſſured poiſon for all animals except men. Inſtances are not wanting of its deleterious effects upon the human ſpecies. To dogs it proves fatal in a very ſhort time; and it has alſo poiſoned hares, foxes, wolves, cats, rabbits, and even ſome birds, as crows and ducks; and Loureiro relates that a horſe died in four hours after taking a drachm of the ſeed in an half-roaſted ſtate. Its effects, however, on different animals, and even on thoſe of the ſame ſpecies, are ſomewhat uncertain, and not always in proportion to the quantity given. With ſome animals it produces its effects almoſt inſtantaneouſly; with others, not till after ſeveral hours, when laborious reſpiration, followed by torpor, tremblings, coma, and convulſions, uſually precede the fatal ſpaſms, or tetanus, with which this drug commonly extinguiſhes life. The mortal ſymptoms in human ſubjects are ſimilar to thoſe now mentioned in brutes; and from theſe, as well as the diſſection of dogs killed by this poiſon, and manifeſting no injury done to the ſtomach or inteſtines, it has been inferred that the nux vomica acts immediately upon the nervous ſyſtem, and deſtroys life by the virulence of its narcotic influence. The quantity of ſeed neceſſary to produce this effect upon a ſtrong dog need not be more than a ſcruple; a rabbit was killed by five, and a cat by four grains; and of four perſons, who periſhed by this drug, one was a girl of ten years of age, to whom fifteen grains were exhibited at twice for the cure of an ague. Loſs, however, ſays, that he took one or two grains of it in ſubſtance, without diſcovering any bad effect; and that a friend of his ſwallowed a whole ſeed without injury. Hermannus, botanic profeſſor at Leyden, who has written expreſsly on it, ſays, that the vomic nuts of Timor and Ceylon are, for the human ſpecies, excellent ſudorifics, and are alſo to be ranked among diuretic medicines.

It has been recommended in tertian and quartan fevers, in virulent gonorrhœas, as well as an alexipharmic. Fallopius relates, that it was given with ſucceſs in the plague; that in doſes of from a ſcruple to half a drachm, it procured a plentiful ſweat; in which caſe the patient recovered. From the time of Geſner till a period of late date, it has been recommended by a ſucceſſion of authors, as an antidote to the plague, as a febrifuge, as a vermifuge, and as a remedy in mania, hypochondriaſis, hyſteria, rheumatiſm, gout, and canine madneſs. With us it is now conſidered, and not without good reaſon, as a deleterious drug, and is rarely if ever employed as a medicine. In Sweden it has been of late years ſucceſsfully uſed in dyſentery, but Bergius, who tried its effects in this diſeaſe, ſays, that though it ſuppreſſed the flux for twelve hours, it afterwards returned again. In one caſe, a woman, who took a ſcruple night and morning for two ſucceſſive days, is ſaid to have been ſeized with convulſions and vertigo, notwithſtanding which the dyſenteric ſymptoms returned, and the diſorder was cured by other medicines; but it was followed by a pain in the ſtomach, the effect of the medicine, which continued for a long time. Bergius is therefore of opinion, that it ſhould only be adminiſtered in the character of a tonic and anodyne in ſmall doſes from five to ten grains, and not till after proper laxatives have been employed. Loureiro recommended it as a valuable internal medicine in fluor albus, for which purpoſe he roaſts it till it becomes perfectly black and friable, which renders its medicinal uſe ſafe without impairing its efficacy.

The lignum colubrinum and Ignatius's bean, partake of the ſame qualities with the nux vomica. Lewis.

NUX *Zeylanica*, in *Botany*. See STERCULIA.

NUXIA. See MANABEA.

NUYS, or NUESZ, in *Geography*, a town of France, in the department of the Roer, ſituated on the Erfft, near its conflux with the Rhine. This town carries on a briſk trade in deal boards and coal; 22 miles N.N.W. of Cologne. N. lat. 51° 10'. E. long. 6° 35'. See NEUSS.

NUZZI, MARIO, in *Biography*, commonly known by the name of Mario dè Fiori, a flower-painter, was born in 1603, at Penna, in the kingdom of Naples. He was educated under his uncle Tomaſo Lalini, and being an exact obſerver of nature, he employed himſelf in copying the fineſt flowers cultivated by his father on a terrace on the roof of his houſe. So happy were his imitations, that a dealer who purchaſed his firſt pictures made an extraordinary profit in

in ſelling them again. Mario, informed of this circumſtance, and alſo learning that his performances ſold ſtill higher at Rome, reſolved to viſit that capital. Here he quickly roſe to a high degree of reputation, and applied himſelf moſt diligently to attain perfection in his branch of the art. His repreſentations of nature were equally exact and elegant; he choſe his ſubjects with taſte, handled his pencil with wonderful lightneſs, and coloured with ſingular beauty. According to Mr. Fuſeli, "the charm which Mario ſpread over his flowers was not a permanent one: the impurity of the vehicle ſoon abſorbed the freſhneſs and the bloom of his glazings, and left a ſqualid ſurface." Hence his pictures did not long maintain the extraordinary prices at which they were purchaſed. He was elected a member of St. Luke, and received from his brethren all the reſpect that great excellence, though in an inferior department of the art, could command. He died in 1673, at the age of ſeventy. He was a moſt diligent artiſt, and always worked at his profeſſion early in the morning, ſaying, that "he who did not ſee the ſun riſe, loſt half the day."

NY, in *Geography*, a town of Sweden, in the province of Warmeland; 36 miles N.W. of Carlſtadt.—Alſo, a town of Sweden, in the ſame province; 53 miles N. of Carlſtadt.

NYAKER, a town of Sweden, in Angermanland; 85 miles N.N.E. of Hernoſand.

NYAMEE, a town of Africa, in the kingdom of Bambarra; 48 miles N.E. of Sego.

NYAMOV, a town of Africa, in the kingdom of Bambarra; 140 miles W. of Sego.

NYARA, a town of Africa, in the kingdom of Bambarra; 40 miles N.E. of Sego.

NYARPET, a town of Hindooſtan, in the Carnatic; 35 miles N.E. of Bomrauzepollam.

NYAYA, in *Philoſophy*, is the name of one of the ſchools of the Hindoos. The doctrines upheld by this ſect are divided into two parts: the firſt, Nyaya, or Nyayai, correſponds more than any other with the Peripatetic, and is aſcribed to Gautama, the Ariſtotle of Hindoo philoſophy. The ſecond, Nyayai, is ſometimes called Vaiſiſhika, and is ſomewhat analogous to the Ionic theory: its author, Kanada, thus correſponds with Thales. It is not eaſy to mark the diſtinctions between the doctrines of the two ſects of Nyayaikas, as the followers of them, more eſpecially of the firſt ſect, are called. The theory of Kanada is, indeed, little elſe than a modification of that of Gautama; the latter being the moſt ancient. The death of its author is placed about 550 years B.C. As well as philoſophy, the Nyaya doctrines embrace an extenſive ſyſtem of logics and metaphyſics. The leading parts are the following: There are two eternal ſubſtances, *ſpirit* and *matter*; the one diſtinguiſhed by life and intellect, the other is inert and lifeleſs, moving only as it is impelled by ſpirit. It is not, however, ſaid that the world in its preſent form has exiſted from eternity, but only the primary or chaotic matter, whence it ſprings when commanded by the creative power. Matter, in its primary ſtate, is an inviſible figureleſs ſubſtance. In the Sanſcrit language, matter in this ſtate is expreſſed by the word *beej*, or *bija*, which ſignifies *ſeed*; from this ſeed, or germ, the world is called forth by the Almighty fiat, and at its periodical diſſolution all things return to the ſeminal ſtate, in which they remain until again ſpread out by creative energy. Some explanation of this, or at leaſt the manner in which it is expreſſed by Hindoo metaphyſicians, may be found under the article KALPA. In the Gita, Kriſhna is made to ſay, "I am the eternal ſeed of all nature. The whole world was ſpread abroad by me in my inviſible form; at the end of the period kalpa, all things return into my primordial ſource, and at the beginning of another kalpa I create them all again." (See KRISHNA.) In the proceſs of creation the firſt form of material ſubſtance is called, by the Nyayaikas, *anù*; in this inviſible atomical condition, matter is eternal. Two anùs, or atoms, make a *dwenùk*, three a *trinùk*, and ſo forth; arriving at the bulk of the latter, matter aſſumes figure and becomes viſible, and in this ſtate it is periſhable. Hence in the Nyayai ſyſtem, the elements, water, earth, fire, &c. are divided into what is temporary, and what is eternal: the viſible ſtate of water, for example, is temporary; its primary ſtate, or eſſence, is eternal.

The combinations or aggregations which compoſe the material univerſe, are produced by the energy of an almighty and intelligent cauſe, the Supreme Being. "Matter is incapable of action; whence it is evident that the motions of material objects are cauſed by a being different from thoſe objects;" and hence is deduced the exiſtence of God. The following paſſage is tranſlated from a reſpected Sanſcrit author, on the opinion of the Nyayaikas: "Though individuals have in themſelves the conſciouſneſs that I am, I feel pleaſure, &c. yet we have no evident knowledge that ſpirit and matter are different: this is proved by the following argument: an inſtrument requires an operator; thus, without an operator no effect can reſult from cutting inſtruments, as an axe, &c.; in like manner, without an operator, no effect would reſult from the eyes, &c. which are the inſtruments of viſion, &c.; hence we infer the exiſtence of an operative being."

The Nyayaiks conceive that ſpirit is a figured ſubſtance, which means that it poſſeſſes magnitude, but this magnitude is indiviſible. According to Hindoo metaphyſics, whatever is the ſubject of active and moral qualities, muſt have magnitude, for theſe qualities imply action and change; but what is abſolutely without magnitude and figure, muſt be impoſſible and unchangeable; hence, as the Nyayaiks maintain that the Supreme Being is the immediate and active agent in the creation of the world, and that perception, deſire, and action, are in him permanent qualities, they aſcribe to him an inviſible magnitude. This magnitude is ſo ſmall that it moves in the ſmalleſt nerves, though they be only the thouſandth part of the diameter of a hair; and this notion is ſupported by, or grounded on, a paſſage in the Veda: "Spirit is more minute than the minuteſt atom, more ſubtle than the ſubtleſt thing." But it muſt not be inferred from this that they are materialiſts; for they maintain an eſſential diſtinction between the phenomena of matter and ſpirit.

They believe that the ſoul is a portion of the Supreme Being, and has a ſeparate individual exiſtence. It is diſtinguiſhed from the Creator by not poſſeſſing eſſentially and permanently the qualities of perception, deſire, and action; and it is, moreover, ſubject to ignorance and ſorrow, but the ſupreme ſpirit is perfect and eternally bleſſed. "Truth and intelligence," to uſe their own words, "are the attributes of God, and are not to be aſcribed to the ſoul, which is the ſubject both of knowledge and ignorance, pleaſure and pain; by which it is diſtinguiſhed from the ſupreme ſpirit; therefore God and the ſoul are entirely diſtinct beings. If this be denied, how can you account for the ſoul being confined to material habitations, and again releaſed from them?"

While embodied in matter, the ſoul is under the influence of evil paſſions, but having, by intenſe ſtudy and contemplation, arrived at the knowledge of the natural elements and principles, it attains the place of the eternal. In this ſtate of beatitude, its individuality does not, however, ceaſe; but on this difficult point they expreſs themſelves very obſcurely.

They

They admit that the ſoul is united to the Supreme Being, but conceive that it ſtill retains the abſtract nature of definite or viſible exiſtence.

The diſſolution of the world proceeds from the deſtruction of the viſible forms and qualities of things, but their material eſſence remains, and from it new worlds are formed by the creative energy of the Almighty; and thus the univerſe is diſſolved and renewed in endleſs ſucceſſion. This theory is not, however, confined to the ſect that is the ſubject more particularly of this article; but is common, under ſome modification or varied expreſſion, to others of their ſchools. Under the article PHILOSOPHY *of the Hindoos*, ſome general information will be found on theſe points, and ſome details under the ſeveral articles thence referred to.

What is here ſaid, taken chiefly from the Prabod'h Chandrodaya, may more than ſuffice as to the theory aſcribed to Gautama; whoſe doctrines, as far as they are compriſed in works ſaid to be his, are related in a very ſuccinct manner, and in a ſtrictly ſyllogiſtic ſtyle, but are immerſed and loſt almoſt in an endleſs maſs of expoſition and commentary. The name of this logician is variouſly pronounced in different parts of India, and his doctrines are variouſly expounded. He is ſaid to have been raiſed to divine honours, and to be the ſame with the Godama of the Birman empire. (See GODAMA.) And if ſo, but the fact may be reaſonably doubted, he is identified with the Boodh, or Budha, ſo extenſively worſhipped in Aſia. See BOODH.

NYBE, in *Geography*, a town of Sweden, in North Jutland; N. lat 56° 59'. E. long. 9° 39'.

NYBELLED, a town of Sweden, in the province of Smaland; 43 miles N.N.W. of Calmar.

NYBORG, or NYEBORG, a ſea-port town of Denmark, on the E. coaſt of the iſland of Funen, in a bay of the Great Belt, ſurrounded with a rampart and a ditch. The fortifications, as well as the caſtle, are now in a ſtate of dilapidation; and a palace which was formerly the reſidence of the kings of Denmark, is in ruins. The inhabitants derive their ſubſiſtence partly from paſſengers who daily croſs from and to Corſoer in Zealand, and partly from an inconſiderable commerce. The ſhips that navigate the Great Belt pay toll here, for which purpoſe a man of war is always ſtationed in the Belt; 16 miles W. of Corſoer. N. lat. 55° 22'. E. long. 10° 48'.

NYBY, a town of Sweden, in Eaſt Gothland; 28 miles W. of Linkioping.

NYCHINTA, a town of Bengal; 30 miles N. of Mauldah.

NYCLEE, a town of Hindooſtan, in Bahar; 15 miles N.W. of Chuprah. N. lat. 26°. E. long. 84° 31'.

NYCTAGES, or NYCTAZONTES, derived from νυξ, *night*, a religious ſect, diſtinguiſhed by their inveighing againſt the practice of waking in the night, to ſing the praiſes of God; in regard, ſaid they, the night was made for reſt.

NYCTAGINES, in *Botany*, a natural order of plants in Juſſieu, the 3d of his 7th claſs, named from his *Nyctago*, the *Mirabilis* of Linnæus, which is one of the number.

This 7th claſs conſiſts of dicotyledonous plants without a corolla, whoſe ſtamens are inſerted below the germen. Their *calyx* is inferior, of one or many leaves. *Corolla* generally none; ſometimes there are petal-like ſcales, below the germen, either bearing the ſtamens, or alternate with them; ſometimes there is even a petal-like inferior tube, not bearing the ſtamens, often withering; or bearing the ſtamens, being formed of their combined filaments. *Stamens* inferior, that is inſerted below the germen, definite in number, their filaments diſtinct, or more rarely monadelphous. *Germen* ſuperior, ſimple; ſtyle one, or ſeveral, of a definite number, or wanting; ſtigma either ſimple or manifold. *Seed* either ſolitary, or the capſule ſuperior, of one or two cells, with one or ſeveral ſeeds.

The *Nyctagines* are thus defined.

*Calyx* tubular, reſembling a corolla, either naked externally, or ſurrounded by a ſmall outer calyx. *Germen* one; ſtyle one; ſtigma ſimple. *Stamens* definite, inſerted into a gland which ſurrounds the germen, and originates from the receptacle. *Seed* one, covered by the gland, as well as by the bottom of the tube of the calyx, both of them being permanent. *Corculum* ſurrounding a farinaceous maſs. *Stem* either ſhrubby or herbaceous. *Leaves* oppoſite or alternate. *Flowers* axillary and terminal.

The genera are *Nyctago* (which is *Jalapa* of Tournefort, *Mirabilis* of Linnæus, *Nyctage* of Van Royen, a multiplicity of names to little purpoſe); *Abronia*, Juſſ. 448. Lamarck Illuſtr. t. 105. (*Tricratus* of Willd. Sp. Pl. v. 1. 807.); *Boerhavia*; *Piſonia*; and *Buginvillæa* of Commerſon, Lamarck Illuſtr. t. 294. To theſe are to be added *Oxybaphus* of L'Heritier, Willd. Sp. Pl. v. 1. 185. Curt. Mag. t. 434. See OXYBAPHUS.

NYCTAGO, ſo called by Juſſieu, from νυξ, νυκτος, *the night*, and αγω, *to bring*, or *to be concerned with*, becauſe the flowers expand, and are fragrant at that time only, whence the French name of Belle-de-nuit for the ſame plant. See MIRABILIS and NYCTAGINES.

NYCTALOPIA, νυκταλωπια, in *Medicine*, ſignifies, in the writings of the more accurate authors, *night-blindneſs*, or that affection of the ſight, which renders the patient incapable of perceiving objects after ſun-ſet. The word ſtands in oppoſition to HEMERALOPIA, or *day-blindneſs* (which ſee); and is probably derived from νυξ, *the night*, and αλαω, which conſiſts of αω with the privative α.

We have ſtated, however, in the article juſt referred to, that there is a wide difference in the acceptation, in which both ancient and modern writers have uſed this term; ſome conſidering the *nyctalopia* as night-*blindneſs*, while others interpret it night-*ſight*, and both of courſe uſing the word *hemeralopia*, in like manner, in oppoſite ſignifications. Galen, Paul of Ægina, Aëtius, Pliny, and Celſus, conſider the term in the light in which we have defined it. Hippocrates, on the contrary, had ſpoken of *nyctalopes*, as perſons who ſaw moſt perfectly in the night: οἱ δὲ τῆς νυκτὸς ορῶντες, ὡς δὴ νυκτάλωπες καλέομεν. Προρρ. II. Again, the author of Med. Definit., aſcribed to Galen, defines *nyctalopia*, night-ſight; while the author of the Iſagoge, attributed to the ſame, affirms that it is properly uſed in either ſenſe.

The night-blindneſs appears to ariſe from a diminution of ſenſibility in the retina of the eyes, ſo that the impreſſion of a ſtrong light only is capable of producing the ſenſation of viſion. Hence profeſſor Scarpa has conſidered the diſeaſe as an "imperfect amauroſis." In the complete amauroſis, the retina is altogether inſenſible to the impreſſions of light; the patient is totally blind under all circumſtances, although no material morbid appearance is viſible in his eyes. But in the nyctalopia, he ſees perfectly well during the broad day-light only; and, as the duſk of evening advances, he finds all objects begin to appear indiſtinct, as if a gradually thickening miſt were interpoſed between them and his eyes; and the light of candles, or of the moon, is altogether imperceptible. He remains, therefore, *blind* until the approach of ſun-riſe in the morning, when objects again begin to appear to him, enveloped in a miſt, which gradually vaniſhes, as the ſun advances to the horizon; after which his ſight becomes as perfect as that of other individuals, during the light of day.

This morbid condition of the retina is ſometimes congenital, and therefore conſtitutional, and altogether beyond the

reach of any curative meaſures. It has ſometimes been hereditary, and ſometimes, as in an inſtance known to the writer of this article, it has occurred in two children of the ſame family. A caſe of congenital nyctalopia, which had continued many years without change, and independently of any diſeaſe, is related by Dr. Parham. See Med. Obſervat. and Inquiries, vol. i. p. 122, *note*.

Moſt commonly, however, the nyctalopia is a diſeaſe of the retina, induced by temporary and accidental circumſtances, and capable of being removed by medicine. It is brought on, in theſe caſes, by various cauſes which debilitate the conſtitution, in individuals of very irritable habit; and is ſometimes one among the various ſymptoms, called *nervous*, which occur in hyſterical and hypochondriacal patients. Moſt frequently, however, it ſeems to be occaſioned by ſympathy with a deranged ſtate of the ſtomach and bowels, or of the hepatic ſyſtem; and the German practitioners, eſpecially the able ſurgeons Schmucker and Richter, and after them the celebrated Italian ſurgeon, Scarpa, have ſhewn, that the diſeaſe is readily removed by correcting the condition of theſe abdominal viſcera, particularly by the free uſe of purgatives, after emetics. (See Scarpa on the Diſeaſes of the Eyes, tranſlated by Briggs, chap. 19.) In this view of the ſubject, the nyctalopia is to be conſidered as analogous to the vertigo, head-ache, ringing of the ears, and other nervous affections of the head, which accompany indigeſtion, and requires to be treated by ſimilar means. (See Indigestion.) The recommendation of ſtrong emetics, which the foreign ſurgeons direct to be repeatedly adminiſtered, is perhaps the reſult of hypothetical notions, relative to the *ſaburra* of the ſtomach, rather than of careful obſervation; and it is probable that their active ſtomachic purgatives, compoſed of rhubarb and antimony, with ſtimulant gums, were the moſt valuable remedies.

In conſequence of the *periodical* returns of the blindneſs every evening, ſome practitioners have ſuggeſted the propriety of adminiſtering the Peruvian bark, which is peculiarly remedial in intermittent diſorders in general. But theſe practitioners have failed to obſerve, that there is no periodical or intermittent change in the organ of viſion; the intermiſſions are excluſively confined to the external circumſtances, *viz.* to the abſtraction and return of the light. Accordingly Scarpa has juſtly remarked: "with reſpect to the *imperfect periodical amauroſis*, every practitioner would be diſpoſed to believe that the cinchona ought to be the ſpecific; experience, however, has proved the contrary, and convinced us that this excellent remedy, which is ſo efficacious in intermittent fevers, and other periodical diſeaſes, rather aggravates this complaint, and renders its attacks more frequent, and of longer duration than before. It is, on the contrary, moſt frequently cured in a ſhort time, by emetics and internal reſolvents, *after* which corroborants and bark become uſeful."

NYCTANTHES, in *Botany*, derived from νυκτος ανθος, *the flower of the night*, becauſe, ſays Gerarde, "its moſt odoriferous and ſweet-ſmelling floures flouriſh and ſhew themſelves only in the night time, and in the day time looke withered and with a mourning cheere." Linn. Gen. 9. Schreb. 12. Willd. Sp. Pl. v. 1. 35. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 15. Juſſ. 104. Lamarck Illuſtr. t. 6. (Parilium; Gærtn. t. 51. Scabrita; Linn. Mant. 3. Schreb. 66. App. 819.) Claſs and order, *Diandria Monogynia*. Nat. Ord. *Sepiariæ*, Linn. *Jaſmineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, truncated, entire, permanent. *Cor.* of one petal, ſalver-ſhaped; tube cylindrical, the length of the calyx; limb five-cleft, ſpreading, the ſegments two-lobed. *Stam.* Filaments two, in the centre of the tube, very ſhort; anthers oblong, as long as the tube. *Piſt.* Germen ſuperior, nearly ovate; ſtyle thread-ſhaped, the length of the tube; ſtigmas two, acute. *Peric.* Capſule obovate, compreſſed, with an emarginate point, coriaceous, two-celled; cells parallel, compreſſed, without valves. *Seeds* ſolitary, obovate, convex on one ſide, flat on the other, attached to the bottom of the cell.

Obſ. The corolla is uſually five-cleft, but Schreber has ſeen it with ſix, or even ſeven, ſegments, and Linnæus with only four. The latter found four ſtamens.

Eſſ. Ch. Corolla ſalver-ſhaped, with truncated ſegments. Capſule two-celled, margined. Seeds ſolitary.

1. N. *Arbor triſtis*. The Sorrowful tree, or Indian Mourner. Linn. Sp. Pl. 8. (Arbor triſtis; Cluſ. Exot. 225. 279. Ger. em. 1527. Myrto ſimilis; Bauh. Pin. 469. Manjapumeran; Rheede Hort. Malab. v. 1. 35. t. 21.)—Native of ſandy deſerts in the Eaſt Indies; and introduced at Kew in 1781, by ſir Joſeph Banks. This *tree* riſes to the height of more than twenty feet, with thick and ſhady, but widely ſcattered *branches*. *Trunk* from one to two feet in diameter, covered with an aſh-coloured *bark*. *Branches* ſquare and knotty. *Leaves* oppoſite, nearly ſeſſile, ovate, pointed, entire, rugged. *Flower-ſtalks* axillary, oppoſite, ſolitary, about half as long as the leaf, ſaffron-coloured, terminated by three ſmall bunches of *flowers*, of a white or yellowiſh colour, like thoſe of Jaſmine, and very highly fragrant at night.

Gerarde tells us "there is made of the ſplinters of the wood certain tooth-picks, and many prety toies for pleaſure." The flowering branches are uſed in the Eaſt for garlands and crowns, and a fragrant water may be diſtilled from them.

Linnæus founded his *Nyctanthes* upon the number of ſegments of the corolla being about eight, without regard to the fruit, of which he was in moſt caſes ignorant. Recent authors with more propriety refer to *Jaſminum* all the ſpecies that have a pulpy fruit; the diviſions of the corolla being found variable in both genera.

Nyctanthes, in *Gardening*, compriſes plants of the ſhrubby exotic flowering kind, of which the ſpecies cultivated is the ſquare-ſtalked nyctanthes (N. arbor triſtis); but other ſpecies may be cultivated for variety.

*Method of Culture.*—This plant may be increaſed by layers and cuttings. The layers may be laid down in the early part of the ſummer, in the uſual method, being made from the young branches, plunging the pots containing them in a bark hot-bed. And the cuttings ſhould be taken from the young ſhoots, be planted out at the ſame time, and managed in the ſame manner.

The plants, when fully rooted in either way, may be removed into ſeparate pots. They ſhould have due ſupplies of water, and be pruned and removed into larger pots, as there may be occaſion.

Theſe plants are very ornamental and fragrant among other potted tender plants.

NYCTELIA Orgia, formed from νυξ, *night*, and τελεω, *to perform*, feaſts in honour of Bacchus; ſo called, becauſe held in the night-time.

A great part of the ceremony conſiſted in running through the ſtreets with the bottle and glaſs in hand, and drinking: but there was no impurity unpractiſed in them.

The Athenians celebrated the nyctelia every three years, at the beginning of the ſpring.

NYCTHEMERON, Νυχθημερον, the natural day. See Day.

NYCTICORAX, in *Ornithology*, a ſpecies of Ardea. See HERON.

NYCTOSTRATEGI, Νυκτοστρατηγοι, among the *Ancients*, officers appointed to prevent fires in the night-time.

At Rome they had the command of the watch, and, from their number and office, were called *nocturni triumviri*.

NYD, in *Geography*, a river of Norway, which runs into the North ſea, in the bay of Drontheim.

NYDALA, a town of Sweden, in the province of Smaland; 26 miles S. of Jonkioping.

NYDAU, a town of Switzerland, in the territory of Bienne, at the N.E. extremity of the lake of Bienne, on the S. ſide of the Tiel canal, oppoſite to Bienne.

NYE, PHILIP, in *Biography*, an eminent Engliſh non-conformiſt divine, who diſtinguiſhed himſelf by his zeal in ſupport of the parliament againſt king Charles I., and during the diſcuſſions in the aſſembly of divines at Weſtminſter, was deſcended from a good family in Suſſex, and born about the year 1596. He was educated and took his degrees at Oxford. Afterwards he entered holy orders, and was appointed, in 1630, to officiate at St. Michael's church, Cornhill, in London. In this ſituation he continued till he became obnoxious to the cenſures of the epiſcopal court, by his refuſing to comply with the impoſitions of archbiſhop Laud. To eſcape perſecution, he fled into Holland, in 1633, and continued abroad during about ſeven years. When the parliament ſeemed to prevail over the intereſt of the king, he returned, and immediately, under the patronage of the earl of Mancheſter, became miniſter of Kimbolton, in Huntingdonſhire. In 1643 he was zealouſly active in Scotland, in procuring the aſſiſtance of the natives, that the taking of the ſolemn league and covenant might be expedited, and after his return, he ſat as a member in the famous aſſembly of divines at Weſtminſter, in the ſelection of whom he had a conſiderable influence. When the reſolution for taking the covenant paſſed the aſſembly and both houſes of parliament, Mr. Nye was one of the perſons appointed to officiate before thoſe bodies. On the day fixed for ſubſcribing it, the two houſes, and the aſſembly being met in the church of St. Margaret, Weſtminſter, he ſpoke in juſtification of taking the covenant from ſcripture precedents, and diſplayed the advantages which the church had received from ſuch ſacred combinations. He then read it from the pulpit with an audible voice, article by article, each perſon ſtanding uncovered, with his right hand lifted up bare to heaven, worſhipping the name of God, and ſwearing to the performance of it. For his great ſervices on this occaſion, and as a reward for his journey into Scotland, he was preſented to the rectory of Acton, near London. Mr. Nye was one of the committee who drew up the preface to the Directory, which was ordered to be ſubſtituted in the room of the Common Prayer book; but when it was determined to eſtabliſh a Preſbyterian form of government, he openly avowed and vindicated his diſſent from it, and contended for the ſcheme of independency, *viz.* "that every particular congregation of Chriſtians has an entire and complete power of juriſdiction over its members, to be exerciſed by the members thereof within itſelf." Mr. Nye intereſted himſelf much in political affairs, and he was often conſulted by men in power. In 1647 he was appointed one of the chaplains who attended the commiſſioners empowered to treat with king Charles I. in the Iſle of Wight; and Anthony Wood ſays, that about the ſame time he was employed to obtain ſubſcriptions from the London apprentices, &c. againſt a perſonal treaty with the king, while the citizens of the metropolis were petitioning for one. In the year 1653 he was appointed one of the *tryers* for examining into the qualifications and characters of miniſters; and in 1654 he was nominated one of the aſſiſtants to the commiſſioners for ejecting inſufficient miniſters and ſchool-maſters. He was one of the principal managers in the aſſembly of the congregational churches appointed to meet in the Savoy, in 1658, which conſiſted of miniſters and meſſengers from more than a hundred churches in England: the reſult of their meetings was, "A Declaration of the Faith and Order owned and practiſed in the Congregational Churches in England, &c." Soon after the reſtoration of king Charles II. he was ejected from his living, and afterwards preached privately to a congregation of diſſenters, as opportunity offered, till the year 1672, when he died, about the age of ſeventy-ſix. He was author of many works, the titles of which may be ſeen in the Biog. Brit. and Gen. Biog. to which, and to Toulmin's Neal. we refer our readers.

NYEBYE, in *Geography*, a town of Denmark, on the E. coaſt of the iſland of Taaſinge. N. lat. 54° 57′. E. long. 10° 40′.

NYED, a town of Sweden, in the province of Warmeland; 18 miles N.N.E. of Carlſtadt.

NYEKIOBING, an ancient town of Denmark, in the iſland of Falſter, on a narrow channel oppoſite to Laland. This large and well-built town is ſituated in the ſtrait which divides Falſter from Moen; fortified on the land ſide by a wall and ditch, and carrying on a conſiderable trade. The royal palace is a great ornament to the town. N. lat. 54° 46′. E. long. 11° 51′.—Alſo, a town of Denmark, on the N. coaſt of the iſland of Zealand, in the gulf of Iſefiord, having a good harbour and conſiderable commerce. N. lat. 55° 55′. E. long. 11° 41′.

NYEVRE, or NIÉVRE, formerly *Nivernois*, one of the nine departments of the central region of France, in N. lat. 47° 10′, deriving its name from that of a river, which riſes near Champlemy, and runs into the Loire at Nevers, and bounded on the N. by the department of the Yonne, on the E. by the departments of the Côte d'Or, and Sâone and Loire, on the S. by the departments of the Sâone and Loire, and the Allier, and on the W. by the department of the Cher. It is 24 French leagues in length, and 23 in breadth, comprehends 7365 kiliometres, or 362 ſquare leagues, and 251,158 inhabitants, and is divided into 4 circles, 25 cantons, and 330 communes. The circles are Coſne, including 57,788 inhabitants; Clamecy, 65,465; Nevers, 77,596; and Chateau-Chinon, 50,309. According to Haſſenfratz, the number of circles is 9, of cantons 47, and of inhabitants 235,699. The capital is Nevers. Its contributions, in the 11th year of the French era, were 2,145,555 fr., and its expences 218,836 fr. 66 cents. The ſoil of this department, in general, yields grain, wine, flax, fruits, and paſtures; but that of Chateau-Chinon is of a bad quality. It has mines of iron and coal, marble quarries, and mineral ſprings.

NYFFE′, a country of Africa, S. of Caſhna, united with Cabi.

NYKEE, a town of Africa, and capital of a diſtrict in Melli, ſituated on the road from Kong to Caſhna. N. lat. 14° 45′. E. long. 9° 20′.

NYKIRKE, a town of Sweden, in Eaſt Gothland; 24 miles N.W. of Linkioping.

NYKOPING, a town of Sweden, in Sudermanland; 49 miles S.W. of Stockholm. N. lat. 58° 45′. E. long. 16° 53′.

NYKYL, a town of Sweden, in Eaſt Gothland; 10 miles S.S.W. of Linkioping.

NYKYRKA, a town of Sweden, in the government of Abo; 30 miles N.W. of Abo.

NYLACKY, one of the Banda iſlands. S. lat. 4° 11'. E. long. 130° 33'.

NYLAND, the S.E. province of Finland, lying in N. lat. 60° 30'; and being from 15 to 18 leagues from N. to S., and 40 from W. to E., along the N. coaſt of Finland gulf. It is a level, fertile, and, in general, well-cultivated country. Its capital is Helſingfors. The inhabitants of this province ſubſiſt by agriculture, grazing, and fiſhing.

NYL-GHAU, in *Zoology*, an animal brought from the Eaſt Indies, and deſcribed for the firſt time by Dr. Hunter. The name denotes a blue cow, or rather a bull, *ghau* or *gau* being a maſculine. Moſt of theſe animals that have been brought to England have been received from Surat or Bombay; and it is conjectured, that they are indigenous in the province of Guzerat. The nyl-ghau is larger than any ruminant of this country, except the ox; its fleſh will probably be found delicious; and if it ſhould prove docile enough to be eaſily trained to labour, its great ſwiftneſs, with conſiderable ſtrength, might be applied to valuable purpoſes. In ſize it ſeems to be a mean between black cattle and deer; being as much ſmaller than the one, as it is larger than the other; and in its form there is a very evident mixture of reſemblance to both. Its body, horns, and tail, are not unlike thoſe of a bull, and the head, neck, and legs, are very like thoſe of a deer. Some have made this animal a ſpecies of the antelope, (the *Antilope picta*,) but Mr. Hunter, who diſſected it, apprehends that it is a new ſpecies. The colour, in general, is aſh or grey, from a mixture of black hairs and white: moſt of them are half white towards the root, and half black; the height of the back is about four feet, and the trunk, from the root of the neck to the pendulous tail, is about the ſame length; along the ridge of the neck and back the hair forms a ſhort and thin upright mane; the legs are ſmall in proportion to their length; the neck is long and ſlender as in the deer, and when the head is raiſed, it reſembles the Italic *S*; at the throat there is a ſhield-like ſpot of beautiful white hair; and lower down, on the beginning of the convexity of the neck, there is a mane-like tuft of long black hair. There are ſix grinders on each ſide of the jaw; and four inciſores in each half of the lower jaw; the horns are ſeven inches long, and of a triangular ſhape. The nyl-ghau eats oats, is fonder of graſs and hay, and more fond of wheat bread. When thirſty, it would drink two gallons of water. It is vicious and fierce in the rutting ſeaſon, but at other times tame and gentle. The female differs ſo much from the male, that we ſhould ſcarcely ſuppoſe them to be the ſame ſpecies. She is much ſmaller, both in height and thickneſs. In her ſhape and yelloviſh colour ſhe very much reſembles deer, and has no horns; yet has four nipples, and is ſuppoſed to go nine months with young; ſhe has commonly one at a birth, and ſometimes twins. The young male nyl-ghau is like the female in colour, and therefore like a fawn.

The firſt of theſe animals that were ever brought to England, were ſent from Bombay to lord Clive, in 1767: they were male and female, which bred every year. For a more minute deſcription of this animal, ſee Phil. Tranſ. vol. lxi. part i. art. 21.

NYLODESE, or New Lodese, in *Geography*, a town of Sweden, in Weſt Gothland, ſituated on the North ſea; formerly flouriſhing and governed by its own laws; but being burnt by the Danes in 1611, the inhabitants withdrew to Almgſahs.

NYMPH, Nympha, in *Mythology*, a ſort of heathen divinity, ſuppoſed to preſide over waters, rivers, and fountains.

The word comes from νυμφη, *a bride*, or *woman newly married;* and was applied to theſe deities becauſe repreſented under the figure of young maids. Though others derive nymph from *lympha*, *water*, on account of their inhabiting near the waters. See Lymphati.

Some extend the name nymph farther, and compriſe under it the goddeſſes of the fountains, foreſts, and trees; called particularly, Oreades, Dryads, and Hamadryads; as well as thoſe of the ſea, called Nereids, and thoſe of the air, called Auræ.

Meurſius is of opinion, the Greeks borrowed their notion of theſe divinities from the Phœnicians; for *nympha*, the ſame with *nephar*, in their language, ſignifying *ſoul*. The Greeks imagined that the ſouls of the ancient inhabitants of Greece wandered much about the tombs where their bodies were interred, or in the places which they had frequented during their abode in this world; and accordingly were become nymphs; particularly, that the ſouls of thoſe who had inhabited the woods were called Dryads; thoſe who had inhabited the mountains, Oreades; thoſe who had dwelt on the ſea-coaſts, Nereids; and, laſtly, thoſe who had their place of abode near rivers or fountains, Naiads.

This opinion is confirmed by the prevalent notion, that the ſtars and higher parts of the univerſe were ſo many animated beings; and that tutelar deities were aſſigned to the earth, the groves, the mountains, and the rivers. Accordingly, this is ſuppoſed to be the original of thoſe divinities; but in later ages, women of all ſorts, from the lady of diſtinction to the ſimple ſhepherdeſs, who had been concerned in any adventure, were denominated nymphs. According to Servius, the number of the nymphs was reduced to 200. Heſiod reckons 300 of them, and, indeed, their number ſeems to have been indefinite. Thus our poets, faithful copiers of the reveries of the ancients, frequently give the name of nymphs to the illuſtrious women who enter into the ſubjects of their poems. Diodorus (l. 3.) ſays, that the wives of the Atlantides were commonly called nymphs; whence it has been concluded, that this was the country where the opinion of the exiſtence of thoſe goddeſſes took its riſe, becauſe the place where the ſouls of heroes were ſaid to dwell after death was in the delightful gardens of Mauritania Tingitana, or near mount Atlas. The Pagans did not believe theſe pretended divinities to be immortal; but they were ſuppoſed to be very long-lived. Heſiod makes them live ſeveral thouſand years. Plutarch has determined the number of years to be 9720. The nymphs, napeæ, and naiads, had their ſacrifices, ſometimes of goats and lambs that were offered them, with libations of wine, honey, and oil; frequently of nothing but milk, fruits, and flowers.

Nymph-*Animal*, in *Natural Hiſtory*, one of the terms uſed by Swammerdam, in his claſſing the inſects according to their ſtates and productions. It expreſſes thoſe creatures, which are produced in their perfect form from the egg, and are ſubject to no changes of any kind afterwards. See Entomology and Insects.

NYMPHA is ſometimes uſed for the little ſkin with which inſects are incloſed; both while they are in the egg, and after they have undergone the firſt apparent transformation. See Insects.

Nympha is more frequently uſed by naturaliſts for the inſects themſelves, while they have yet only the form of worms or maggots.

The word properly ſignifies bride or a new-married woman; it being now, when it has laid aſide its former ſkin, that it begins to ſhew all its parts diſtinctly. In this change it loſes its motion for a while, as when in the egg; ſo that theſe inſects are twice in their nympha ſtate, firſt in the

maggot, which is their firſt nympha; and again in this change, which is their ſecond. See AURELIA.

The only difference between the two nympha ſtates conſiſts in this, that in the latter the members appear more diſtinctly. Swammerdam calls this latter nympha aurea or aurelia, and chryſalis; and the former ſimply nympha. The nymphæ are otherwiſe diſtinguiſhed into vermiformes and oviformes. See ENTOMOLOGY.

NYMPHÆ, in *Anatomy*. See GENERATION.

NYMPHÆA, in *Botany*, νυμφαια of Theophraſtus and Dioſcorides, was ſo called, with much taſte, in alluſion to the nymphs, ſuppoſed to inhabit the pure and limpid waters in which it grows; nor was it an unworthy emblem of the elegance and delicacy attributed to thoſe imaginary beings. Linn. Gen. 264. Schreb. 352. Willd. Sp. Pl. v. 2. 1151. Mart. Mill. Dict. v. 3. Sm. Prodr. Fl. Græc. v. 1. 360. Fl. Brit. 569. Dryand. in Ait. Hort. Kew. ed. 2. v. 3. 292. Juſſ. 68. Lamarck Illuſtr. t. 453. f. 1. Gærtn. t 19, alba. (Caſtaliā; Saliſ. in Ann. of Bot. v. 2. 71.)—Claſs and order, *Polyandria Monogynia*. Nat. Ord. *Hydrocharides*, Juſſ. *Nymphææ*, Saliſ.; an order between the *Ranunculaceæ* and *Papaveraceæ* of Juſſieu. Linnæus placed this genus in his 54th order, moſt juſtly termed *Miſcellaneæ!* He next in manuſcript referred it to his *Rhoeadeæ*, which he afterwards eraſed, ſubjoining a ſuſpicion of its affinity to *Aſarum*. In his *Prælectiones*, publiſhed by Giſeke, it ſtands next to *Sarracenia*, (always in his idea nearly connected with it,) in the *Succulentæ*, to which ſurely it is little related. We heartily concur with Mr. Saliſbury's deciſion concerning the affinity of the genus, though not in the name, which he has transferred from the true plant of the ancients, and replaced by *Caſtalia*, a word incorrect in etymology as well as meaning, and altogether ſuperfluous. See NUPHAR.

Gen. Ch. *Cal.* Perianth inferior, of four or five large, oblong permanent leaves, coloured on the upper ſide. *Cor.* Petals numerous, nearly the length of the calyx, oblong, ſpreading, inſerted in ſeveral rows, upon the lower part of the germen. Nectary globoſe, ſeſſile, in the middle of the ſtigma. *Stam.* Filaments very numerous, inſerted upon the germen, in ſeveral rows, above the petals, linear, flat ſpreading; anthers oblong, on the upper ſide of each filament, opening by two linear fiſſures above. *Piſt.* Germen ſuperior, large, globoſe; ſtyle none; ſtigma orbicular, many-cleft, radiated above, permanent, bearing the nectary. *Peric.* Berry globoſe, with a hard coriaceous coat, internally ſpongy, with numerous cells. *Seeds* very numerous, roundiſh, poliſhed.

Eſſ. Ch. Calyx of four or five leaves. Petals numerous, inſerted into the germen below the ſtamen. Stigma radiated, many-cleft, ſeſſile, with a central nectary. Berry ſuperior, of many cells. Seeds numerous.

Obſ. Many of the diſtinctions between this genus and *Nuphar* were perceived by Linnæus, and all of them are detailed in the *Flora Britannica*, except what regards the nectaries, for which we are indebted to Mr. Saliſbury. No genera can be better defined. As the flowers of *Nuphar* are always yellow, thoſe of *Nymphæa* are white with more or leſs inclination to red or blue; in ſome inſtances of a very fine crimſon. In the *Prodr. Fl. Græc.* we have ſaid that *Nymphæa* is gynandrous, but it is beſt perhaps to reſtrict that term to flowers whoſe ſtamens or anthers grow really out of the ſtyle or ſtigma, altogether above the germen.

1. N. *alba*. Common White Water-Lily. Linn. Sp. Pl. 729. Willd. n. 3. Ait. n. 1. Engl. Bot. t. 160. Fl. Dan. t. 602. Matth. Valgr. v. 2. 245. Camer. Epit. 634. Ger. em. 819. (N. candida; Fuchſ. Hiſt. 535. Nenuphar ſecunda; Brunf. Herb. v. 1. 37.)—Leaves heart-ſhaped, entire; even beneath. Petals elliptic-oblong. Stigma of ſixteen aſcending rays. Root horizontal, creeping.—Native of clear pools, the margins of lakes and of quiet rivers, throughout Europe, flowering in June and July. This is unqueſtionably the true νυμφαια of Dioſcorides, who compares its white flowers to a lily, and mentions the ſaffron-like threads in the middle, as well as the reſemblance of its fruit to a round apple, or poppy-head. The modern inhabitants of Zante call it νεροκολοκυθια, or Water Gourd. Dr. Sibthorp found it frequently in Greece and the neighbouring countries. In England it often occurs in ſtill pools on heaths, or under the ſhade of trees, completely mantling over the water with its broad floating, or partly immerſed *leaves*, which are of an elliptical outline, with a deep ſtraight notch at the baſe, to receive the footſtalk. The *flower-ſtalks* are all radical and ſimple, as in the genus *Nuphar*, each being one large, concave, moſt elegant white *flower*, four or five inches wide, of numerous elliptical petals lying over each other. The upper ſide of the *calyx* is often tinged with a bluſh-colour. The *ſtamens* and *piſtil* are yellow. Theſe *flowers* have little or no ſcent. They are celebrated for cloſing in the afternoon, and lying down upon the water, or ſinking ſomewhat below its ſurface during the night. In the middle of the forenoon they riſe ſome inches above the ſurface, and expand. This phenomenon is chiefly obſervable in hot bright weather, and is doubtleſs owing to the action of light upon the flower, which eaſily riſes or falls in conſequence of the oblique direction of the long and ſlender ſtem. Since the fact has, for ſome reaſon or other, been controverted, we have carefully verified it.

2. N. *odorata*. Sweet White Water-Lily. Willd. n. 4. Ait. n. 2. Sims in Curt. Mag. t. 819. Andr. Repoſ. t. 297.—Leaves heart-ſhaped, entire; the nerve and veins prominent beneath. Petals linear-oblong. Stigma of ſixteen to twenty upright rays, inflexed at their points. Root horizontal, creeping.—Native of North America; not unfrequent here in the more curious gardens, but ſcarcely hardy enough to bear a ſucceſſion of our winters. It flowers in June and July. This is rather ſmaller in all its parts than the foregoing, and is diſtinguiſhed by the ſweet hawthorn-like ſcent of the *flowers*, which have not been obſerved to ſink under water at night, in this country. The prominent veins of the *leaves* diſtinguiſh them, even when dried, from the *N. alba*, and their outline is rather more orbicular than elliptical.

3. N. *nitida*. Siberian, or Cup-flowered, Water-Lily. Sims in Curt. Mag. t. 1359. Ait. n. 3. (N. n. 11; Gmel. Sib. v. 4. 183. t. 71; excluding the ſynonyms.)—Leaves heart-ſhaped, entire; the nerve and veins not prominent beneath. Stigma of twelve to twenty upright rays, inflexed at their points. Root vertical.—Native of Siberia. Mr. W. Anderſon introduced it, in 1809, to the collection of James Vere, eſq., where the plant was found to require heat to keep it alive. In the *Hort. Kew.* it is marked hardy, flowering in July and Auguſt, and ſaid to come from Siberia, as we preſume, on the authority of Gmelin's ſynonym. This much reſembles the laſt, but the *flowers* are leſs expanded, without ſcent, the veins of the *leaves* rather ſunk or furrowed, and the tuberous part of the *root*, as Mr. Anderſon obſerves, not horizontal nor creeping, but perpendicular, and aſcending.

4. N. *pygmæa*. Pigmy Water-Lily. Ait. n. 4. (Caſtalia pygmæa; Saliſ. Parad. t. 68.)—Leaves heart-ſhaped, entire. Stigma of ſeven or eight inflexed rays.—Native

of

of China; introduced in 1805. *Ait.* We received it at Kew in May 1811, when it was flowering plentifully in a tub in the ſtove. This ſpecies is but about half the ſize of any other one as yet diſcovered. Of its *root* we have no information. The *leaves* are about two inches broad, with uſually diſtant lobes; their veins ſunk. *Stalks* ſlender. *Flowers* white, with a ſlight ſweetneſs. *Stamens* yellow, the outer ones much dilated, or obovate, below the anther, and gradually becoming broader and paler, till they aſſimilate entirely with the *petals*, as is the caſe more or leſs in others of this genus.

5. N. *Lotus*. Egyptian Lotus Water-Lily. Linn. Sp. Pl. 729. Willd. n. 6. Ait. n. 5. Sims in Curt. Mag. t. 797. Waldſt. and Kitaib. Hung. v. 1. 13. t. 15. (Lotus ægyptia; Alpin. Exot. 213—229. Λωτος αιγυπτιος, Dioſc. book 4. chap. 114.)—Leaves ſomewhat peltate, ſharply toothed, ſmooth on both ſides, without dots; the veins prominent and reticulated.—Native of Egypt and Hungary. Mr. Loddiges, who obtained ſeeds from the laſt-mentioned country in 1802, was informed that it inhabited warm ſprings, equal to the 95th degree of Fahrenheit. Our Egyptian ſpecimen, from Dr. Delile, is far more luxuriant than what is drawn in the Bot. Mag. This ſpecies differs from all we have hitherto deſcribed, in the ſtrong ſharp teeth of the edges of its *leaves*, whoſe veins moreover are very much branched, elevated on both ſides, and ſtrongly reticulated. The outline of the *leaf* is elliptical, or nearly orbicular, cloven at the baſe into two deep parallel lobes, whoſe diviſion ſeldom extends quite ſo far as the inſertion of the *footſtalk*. Both ſurfaces are ſmooth; the upper poliſhed. *Flowers* larger than in our *N. alba*, white; the *calyx* ribbed; the outer *petals* tinged ſometimes with a faint red, and furniſhed with a green keel. *Stamens* ſomewhat dilated. Rays of the *ſtigma* 27 in our wild ſpecimen, apparently ſpreading. The ancients record the ſinking of the *flowers* under water at night, as in the *N. alba*. The Egyptians fed upon the *roots* and *ſeeds*, both of which abound with farinaceous matter. We have always conceived that this *flower* became ſacred to ſuperſtitious veneration, in that country, in conſequence of its reſemblance to the true Eaſt Indian Lotus, ſee CYAMUS and NELUMBO. The latter, from the mode of its vegetation, was adopted, in the moſt remote ages, to ſerve as an emblem of fertility; but our *N. Lotus* exhibits nothing which could originally have excited ſuch an idea. It ſeems therefore a ſort of ſubſtitute or type; and, if we miſtake not, ſtrengthens the theory of the mythology of Egypt having migrated thither from India. The *Cyamus* plant was indeed brought to Egypt, but has never perpetuated itſelf there to any great extent, nor is it now to be found in that part of the world. In the herbarium of the younger Linnæus is a ſpecimen marked *N. Lotus Americana*, which appears really to belong to this ſpecies. The *leaf* meaſures two feet acroſs. The *anthers* are remarkably long and narrow. We preſume that this ſpecimen came from the Weſt Indies. No mention of any thing like it occurs in Michaux, Walter, or Swartz, but it ſeems the plant of Sloane and Browne, cited by Linnæus under *N. Lotus*.

6. N. *pubeſcens*. Indian Lotus Water-Lily. Willd. n. 7. Ait. n. 6. (N. Lotus; Andr. Repoſ. t. 391. N. indica, foliis amplis, elegantèr ad ambitum crenatis, ſubtùs fulvâ lanugine tectis flore albo ſimplici, é Maderaſpatan; Pluk. Almag. 267. Ambel; Rheede Hort. Malab. v. 11. 151. t. 26.)—Leaves ſomewhat peltate, ſharply toothed; downy, with prominent reticulated veins, beneath; even above; their lobes divaricated, acute.—Native of the Eaſt Indies, from whence ſir Joſeph Banks procured it for Kew garden in 1803. We had ſpecimens from N. E. Kinderſley, eſq. in 1793. This differs eſſentially from the laſt, in having the back of the *leaves* clothed with fine denſe velvet-like down; and the veins not prominent on the upper ſurface. Their *flowers* ſeem nearly to agree. The rays of the *ſtigma* in the preſent are inflexed. We cite Mr. Andrews on the authority of Hort. Kew. only, as there is nothing in his account to verify the ſynonym. On the contrary, he copies from Willdenow the characters of *N. Lotus*, which do not ſuit our plant, nor is the very peculiar character of the downineſs of the *leaves* indicated, though their divaricated ſharp lobes are well expreſſed. Probably the able writer of his letter-preſs ſaw the drawing only, not the plant.

7. N. *rubra*. Red Water-Lily. Ait. n. 7. Andr. Repoſ. t. 503. Sims in Curt. Mag. t. 1280.—*β*, with paler flowers; Sims in Curt. Mag. t. 1364.—Leaves ſomewhat peltate, ſharply toothed; downy, with prominent reticulated veins, beneath; and prominent ribs above; their lobes divaricated and acute.—Native of the Eaſt Indies, from whence it was ſent by the indefatigable and intelligent Dr. Roxburgh. It is cultivated in the ſtove, increaſing much by root, and blooming freely in July and Auguſt. The vivid crimſon of the *petals*, which however appears by the Bot. Mag. to vary in intenſity, at once diſtinguiſhes this from the laſt, with which the pubeſcence of the *leaves* accords. Their colour and ſtains ſeem to us variable. If the prominence of the ribs, and, more or leſs, of the veins, on their upper ſide does not prove a ſufficient ſpecific character, we know not, as yet, of any better. The *ſeeds* and *roots* are ſaid to be eatable, and the *flower* to be held in ſuperſtitious veneration in Hindooſtan, which may ariſe from its affinity to the *Cyamus*, the ſacred *Tamarà* of that country.

8. N. *verſicolor*. Changeable Water-Lily. Ait. n. 8. Sims in Curt. Mag. t. 1189.—Leaves ſomewhat peltate, bluntly toothed, bliſtered on both ſides; their lobes approximated and rounded.—Found in the Eaſt Indies by Dr. Roxburgh, and raiſed by Mr. W. Anderſon at Mr. Vere's in 1807, where it flowers in the ſtove about Auguſt. We have ſeen no ſpecimen, but by the Bot. Mag. this is evidently a moſt diſtinct ſpecies. The *root* propagates itſelf by tubers, like the potatoe, each tuber flowering but once. The *leaves* are nearly orbicular, bluntly toothed; their lobes meeting, or lying over each other, and both their ſurfaces covered with glandular puſtules. The *petals* are pale bluſh-coloured, longer and narrower than in *N. Lotus* or *rubra*, ſeveral of the outer ones green and furrowed at the back, with green ribs on the upper ſide.

9. N. *cærulea*. Blue Water-Lily. Dryand in Ait. n. 9. Andr. Repoſ. t. 197. Curt. Mag. t. 552. Venten. Malmaiſ. t. 6. (N. flore cæruleo odoratiſſimo; Breyn. Prodr. faſc. 2. 86.)—Leaves ſomewhat peltate, very ſlightly and bluntly toothed, ſmooth and even on both ſides. Rays of the ſtigma very numerous, inflexed.—Native of Egypt, from whence we have a ſpecimen, gathered by Dr. Delile, and of the Cape of Good Hope, from which country it was ſent to Kew, in 1792. This elegant ſpecies is now not uncommon in ſtoves or greenhouſes, where it blooms from May to September, being eaſily kept in a tub, without being plunged into the bark-bed. The *leaves* are very ſmooth and even, elliptical in their outline, their lobes ſomewhat pointed, their margin more or leſs wavy, or bluntly crenate, ſcarcely toothed. The large and beautiful blue *flowers* are delightfully fragrant; their *ſtamens* and *piſtil* yellow. *Petals* in three rows, about twenty, and rays of the *ſtigma* as many.

10. N. *ſtellata*. Star-flowered Water-Lily. Willd. n. 5. Ait. n. 10. Andr. Repoſ. t. 330. (N. malabarica; Lamarck Dict. v. 4. 457. Citambel; Rheede Hort. Malab.

v. 11. 53. t. 27.)—Leaves ſomewhat peltate, entire, ſmooth and even on both ſides. Rays of the ſtigma about ten, ſpreading.—Native of the Eaſt Indies. Sonnerat found it in the iſland of Mauritius. Mr. W. Anderſon raiſed this, in 1803, from ſeeds ſent to Mr. Lambert by Dr. Roxburgh, and the plants bloſſomed the ſame ſummer. The whole plant is much ſmaller than *N. cærulea,* and requires more heat. The *leaves* are entire, or ſlightly waved, purple beneath, with rather divaricated lobes. *Petals* blue, ſcarcely more than ten, all in a ſimple row. Rays of the *ſtigma* as many, ſpreading, broad and ſhort. Poiret in Lamarck ſays a decoction of the flowers, with ſugar, is uſed to allay coughs, and ſtop vomiting.

NYMPHÆA, in *Gardening,* compriſes plants of the herbaceous flowery aquatic kind, of which the ſpecies are; the yellow water-lily (N. lutea); the white water-lily (N. alba); the Egyptian water-lily (N. lotus); and the peltated water-lily (N. nelumbo). See the preceding article.

In the ſecond ſort, it is remarked by Linnæus, that the flower raiſes itſelf out of the water, and expands about ſeven o'clock in the morning, and cloſes again, repoſing upon the ſurface, about four in the evening.

From the third ſpecies a bread was formerly made of the ſeed when dried and ground.

And in the fourth kind the Chineſe have the roots not only ſerved in ſummer with ice, but laid up in ſalt and vinegar for winter: the ſeeds are ſomewhat of the ſize and form of an acorn, and of a taſte more delicate than that of almonds; the ponds in China are generally covered with it, and exhibit a very beautiful appearance when it is in flower; and the flowers no leſs fragrant than handſome.

*Method of Culture.*—The two firſt ſorts of theſe plants may be beſt increaſed by procuring ſome of their ſeed-veſſels, juſt as they become ripe and ready to open, and throwing them into canals, ponds, ditches, or other ſtanding waters, where the ſeeds, ſinking to the bottoms, afford plants in the following ſpring, floating upon the ſurface of the waters. And when they have been once fixed to the place this way, they multiply greatly, ſo as to cover ſuch places in a ſhort time. They are alſo capable of being cultivated in large troughs or ciſterns of water, having earth at the bottoms, flouriſhing very well, and producing annually large quantities of flowers.

But the third and fourth ſpecies, as being tender, ſhould be kept in ſuch troughs or ciſterns, and be ſet in a corner of the ſtove. In their native ſituations they are increaſed both by their roots and ſeeds as the common ſorts in this climate.

NYMPHÆUM, in *Ancient Geography,* a town of the Tauric Cherſoneſus, which had a good port on the Euxine ſea, and lay on the route from Theodoſia to Panticapæa.

NYMPHÆUM *Promontorium,* the name given by Ptolemy to the promontory of mount Athos.

NYMPHÆUS, a port on the weſtern coaſt of the iſland of Sardinia, between the promontory Hermæus and the town of Tilium, according to Ptolemy.—Alſo, a river of Aſia, in Armenia, which, according to Procopius, formed a ſeparation between the Roman and Perſian empires. It ran from N. to S., entered the town of Martyropolis, and diſcharged itſelf into the Tigris, S.E. of Amida.

NYMPHAGOGI, Νυμφαγωγοι, among the *Ancients,* an appellation given to thoſe who led the bride from her father's houſe to that of the bridegroom.

NYMPHARENA, in *Natural Hiſtory,* the name of a ſtone found in the beds of ſome rivers, and having the appearance of a ſea-horſe's tooth. Doubtleſs it was a petrified tooth of that or ſome other ſuch animal, ſuch things being often found now, though in thoſe early ages they were little known or regarded.

NYMPHARIUM, in *Botany,* a name given by the Greek writers of the later ages to the water-lily.

NYMPHARUM Oculi, in *Natural Hiſtory,* a name given by ſome of the ancient writers to a ſtone we call oculus beli, and ſometimes to the operculum of a ſhell-fiſh, common on the ſea-ſhores in many places, and called umbilicus Veneris. We are told of Caligula, that he carried his ſoldiers armed to the ſea-ſide, to pick up the nympharum oculi, and ſhells. It is certain, in this place, the word only means umbilicus Veneris, for the other oculi nympharum are found only on the ſhores and in the beds of ſome particular rivers, not on the ſea-ſhores, among ſhells.

NYMPHEA, in *Geography,* a ſmall iſland in the Mediterranean, near the N. coaſt of the iſland of Sardinia; 13 miles W. from the iſland of Roſſa.

NYMPHEUM, Νυμφειον, derived from νυμφη, *bride,* among the *Ancients,* a public hall, or building, magnificently adorned and diſpoſed for banquetting and entertainment; where thoſe, who wanted conveniencies at home, held their marriage-feaſts, &c.

Some authors rather take the ancient nympheum to have been a grotto adorned with ſtatues, jets, and other ornaments; and that it had its name by corruption, from *lymphæum,* of *lympha, water.* In which ſenſe it muſt have been a public bath.

NYMPHOIDES, in *Botany,* or rather, as it ought to have been, *Nymphæoides,* a name given by Tournefort, to a genus which Linnæus united with Menyanthes; ſee that article. It alludes to the likeneſs of the plants in queſtion to *Nymphæa,* in habit at leaſt, though not at all in fructification.

NYMPHOMANIA, in *Medicine,* by many writers termed *Furor uterinus,* a rare ſpecies of diſeaſe in women, characteriſed by an uncontrollable deſire for venereal intercourſe. It is ſimilar to the ſatyriaſis of men. It is ſometimes connected with a morbid condition of the uterus or the vagina, eſpecially with a prurigo of the latter; and ſometimes it is a mere infanity. In a work of this nature, however, it appears to be unneceſſary to enter into a minute detail upon ſuch a ſubject. Sauvages has followed Sennertus, and deſcribed four ſpecies of the diſeaſe, namely, 1. Nymphomania *ſalacitas;* 2. N. *furibunda;* 3. N. *fervor uteri;* and 4. N. *pruriginoſa.* See his Noſol. Method. Claſs viii. Ord. ii. Gen. 14.

NYMPHOTOMIA, (from γυμφα and τεμνω, *ſeco*). In warm countries, the nymphæ are particularly ſubject to a morbid enlargement, in ſuch a degree as to prove troubleſome and inconvenient, and to require the performance of an operation for the removal of the redundant parts. It is to this proceeding that the ancients have applied the term nymphotomia. In this country, ſurgeons occaſionally meet with inſtances, in which the nymphæ are conſiderably increaſed in ſize, and it becomes neceſſary to remove a portion of them.

NYO, in *Geography,* a town of New Mexico, in the province of Cinaloa; 10 miles S.W. of Cinaloa.

NYONS, a town of France, and principal place of a diſtrict, in the department of the Drôme; 21 miles S.E. of Montelimart. The place contains 2724, and the canton 10,145 inhabitants, on a territory of 220 kiliometres, in 16 communes. N. lat. 44° 2′. E. long. 5° 13′.

NYORDBYE, a ſmall iſland of Denmark, near the N. coaſt of Moen, E. of Zealand. N. lat. 55° 3′. E. long. 12° 13′.

NYQUAM,

NYQUAM, a town of Sweden, in the province of Upland; 10 miles E. of Wafteges.

NYSA, in *Ancient Geography*. See SCYTHOPOLIS.—Alſo, a town of Thrace, ſituated between the rivers Meſtus and Strymon, in that part of Thrace called Pæonia, afterwards united to Macedonia.—Alſo, a town of the iſland of Naxos.—Alſo, a town of Aſia Minor, in Caria, ſituated near the Meander.—Alſo, a town of Cappadocia, in the route from Ancyra to Cæſarea, between Parnaſſus and Oſiana.—Alſo, a town of Arabia Felix, on the confines of Egypt.—Alſo, a town of Bœotia, on mount Helicon.—Alſo, a town of India, between the rivers Cophenes and Indus. By Mela and Pliny it is written Neſſa.—Alſo, a town of Lybia.—Alſo, a town of Egypt.—Alſo, a town of Eubœa.

NYSAIS, or NYSÆA *Regio*, a country of Aſia Minor, between Caria and Phrygia, beyond the Meander.

NYSAND, in *Geography*, a town of Sweden, in the province of Warmeland; 18 miles S.S.E. of Chriſtiania.

NYSATRA, a town of Sweden, in Weſt Bothnia; 32 miles N.N.E. of Umea.

NYSLOT, a town of Ruſſia, in the government of Viborg, on the lake Saima. Its caſtle ſtands on a rock in a river near the town, and is well fortified both by art and nature; 50 miles N.W. of Viborg.

NYSSA, in *Botany*, was ſo called by Linnæus, becauſe, as he ſays in the *Hortus Cliffortianus*, "it grows in the waters." In his *Philoſophia* he mentions the name as that of a nymph. Hence profeſſor Martyn gives it as the appellation of a water-nymph; but we have ſought in vain for any ſuch perſonage in poetic ſtory. We are equally ignorant of the meaning of the American name, Tupelo tree.—Linn. Gen. 551. Schreb. 737. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 446. Juſſ. 75.—Claſs and order, *Polygamia Dioecia*, Linn. rather *Decandria Monogynia*. Nat. Ord. *Holeraceæ*, Linn. *Elæagni*, Juſſ.

Gen. Ch. *Cal.* Perianth ſuperior, five-cleft, ſpreading, with a flat baſe. *Cor.* none. *Stam.* Filaments ten or five, awl-ſhaped, erect, ſhorter than the calyx; anthers two-lobed, the length of the filaments. *Piſt.* Germen inferior, ovate; ſtyle awl-ſhaped, curved inwards, longer than the ſtamens; ſtigma acute. *Peric.* Drupa roundiſh. *Seed.* Nut elliptical, acute, angular, ſomewhat irregular, longitudinally grooved.

Eſſ. Ch. Calyx five-cleft. Corolla none. Stamens ten or five. Drupa roundiſh, inferior.

Obſ. Some flowers have ſmall and abortive anthers.

1. N. *integrifolia*. Mountain Tupelo. Ait. Hort. Kew. ed. 1. v. 3. 446. (N. aquatica; Linn. Sp. Pl. 1511, excluding the firſt ſynonym of Cateſby, but retaining his v. 1. t. 41.)—Leaves entire. Nut roundiſh, ſtriated. Native of North America, and cultivated, in 1750, by the duke of Argyle.—This *tree* riſes to the height of thirty or forty feet, and is furniſhed with many, horizontal, depending *branches*. *Leaves* obovate, ſomewhat pointed, dark green and ſhining above, lighter and hairy underneath. *Flowers* in axillary cluſters, ſmall. *Drupas* dark purple, about the ſize of a ſmall cherry. The timber of this tree is ſaid to be hard and cloſe-grained, ſo as to be much in requeſt with wheel-wrights and other ſuch artificers.

2. N. *denticulata*. Water Tupelo. Ait. Hort. Kew. ed. 1. v. 3. 446. (Arbor in aquâ naſcens, foliis latis acuminatis et dentatis, fructu Elæagni majore; Cateſb. Car. v. 1. 60. t. 60.)—Leaves remotely toothed. Nuts oblong, grooved, ſomewhat wrinkled.—Native alſo of North America, in wet ſwamps or near large rivers, and introduced into this country in 1735, by Mr. Peter Collinſon.—This *tree* is from eighty to an hundred feet high, and much branched towards its ſummit. *Leaves* rather large, oval or ſpear-ſhaped, ſlightly toothed, downy beneath; their footſtalks long and ſlender. *Drupa* in ſhape and ſize like ſmall olives, indeed they are preſerved by the French inhabitants of the Miſſiſippi like that fruit. The *timber* is light and compact.

Profeſſor Martyn tells us that Marſhall, in his American Grove, adds a third ſpecies from Bartram's catalogue, which he calls *Nyſſa Ogeche*. This is deſcribed as a *tree* of great ſingularity and beauty, riſing to the height of thirty feet, whoſe *fruit* is of a deep ſcarlet colour, and the ſize of a Damaſcene plum. It has an agreeable acid taſte, whence it is called the Lime-tree.

NYSSA, in *Gardening*, a plant of the aquatic ornamental tree kind, of which the ſpecies are; the mountain tupelo (N. integrifolia); and the water tupelo (N. denticulata).

*Method of Culture.*—Theſe trees may be increaſed by ſowing the ſeeds procured from the places where they grow naturally, putting them into the ground as ſoon as they are procured, as they lie long before they vegetate. They ſhould be ſown in pots filled with light loamy earth, placing them where they may have only the morning ſun; and during the firſt ſummer the pots ſhould be kept clean from weeds, being well watered in dry weather. The pots ſhould be plunged into the ground in the following autumn; and, if the winter prove ſevere, cover them with old tan, peas-haulm, or other ſimilar light covering. And in the following ſpring they ſhould be plunged into a moderate hot-bed, hooped and covered over with mats; keeping the earth conſtantly moiſt. By this means the plants are brought up in the ſpring, when they ſhould be gradually hardened to bear the open air; and during the following ſummer, the pots again plunged into an eaſtern border, watering them in dry weather, carefully removing them into a frame in the autumn, where they may be ſcreened from froſt; but in mild weather be expoſed to the open air. In the ſpring following, before they begin to ſhoot, they ſhould be parted carefully, planting each in a ſmall pot filled with loamy mould; and when they are plunged into a moderate hot-bed, it will promote their putting out new roots; after which they may be plunged in an eaſtern border, and be ſheltered again in winter, under a frame. In the third ſpring, ſuch plants as have made the greateſt progreſs may be planted out in a loamy ſoil, in a ſheltered ſituation, where they may be capable of enduring the cold of this climate. They make the greateſt progreſs where the ſoil is inclined to be moiſt.

And they may likewiſe be propagated by layers and cuttings, planted out in the autumn or ſpring in the uſual manner.

Theſe plants afford ornament and variety in the ſhrubbery and other parts, where the ground is of a moiſt quality.

NYSSANTHES, in *Botany*, received that appellation from Mr. R. Brown, in alluſion to the ſpinous nature of the calyx-leaves and bracteas, the chief characteriſtic diſtinction between this genus and *Achyranthes*; the word being derived from νυσσω, *to prick*, or *wound*, and ανθος, *a flower*. Brown. Prodr. Nov. Holl. v. 1. 418.—Claſs and order, *Tetrandria Monogynia*. Nat. Ord. *Amaranthi*, or *Amaranthaceæ*, Juſſ. Brown

Eſſ. Ch. Calyx in four deep ſegments; the two outer ones unequal, hardening into ſpines. Stamens two or four, combined at the baſe, with intermediate ſcales. Anthers of two

two cells. Stigma capitate. Capſule membranous, not burſting. Seed ſolitary.

The *ſtem* in this genus is either herbaceous or ſomewhat ſhrubby. *Leaves* oppoſite. *Spikes* denſely cluſtered, axillary and terminal. The four-cleft and irregular, as well as ſpinous, *perianth* diſtinguiſhes *Nyſſanthes* from *Achyranthes*, to which it is otherwiſe nearly allied.

1. N. *erecta.*—Stamens four. Segments of the calyx downy, five-ribbed; the awn of the lower one ſcarcely ſo long as itſelf. Leaves oblong-lanceolate, acute; with a very ſhort weakiſh point. Stem erect.—Gathered by the author, near Port Jackſon, New South Wales.

2. N. *media.*—Stamens two. Segments of the calyx downy, three-ribbed; the awn of the lower one longer than itſelf. Leaves oval-oblong, bluntiſh; with a pungent point. From the ſame country.

3. N. *diffuſa.*—Stamens two. Segments of the calyx ſmooth, five-ribbed; awns longer than themſelves. Leaves of the branches oval-oblong; with a pungent point. Stem diffuſe.—Gathered by Mr. Brown in the tropical part of New Holland. The *leaves* are ſcarcely half an inch long.

NYSTADT, in *Geography*, a ſea-port town of Sweden, pleaſantly ſituated on the coaſt of the gulf of Bothnia, in Finland. Its harbour is commodious, and it has a conſiderable trade in all kinds of wooden veſſels; 32 miles N.W. of Abo. N. lat. 61° 5′. E. long. 21° 20′.

NYSTED, or NYESTED, a large but not flouriſhing town of Denmark, in the iſland of Laland. Its extent has been much reduced by fire. Its trade to the duchy of Mecklenburg and other provinces of Germany is conſiderable. In this town are the remains of a ſtately monaſtery, built in 1286; 19 miles S.E. of Naſkow. N. lat. 54° 48′. E. long. 11° 45′.

NYWICHWANNAK, a river of America, being one of the branches of the Piſcataqua.

# O.

## O

O The fourteenth letter of the alphabet; and the fourth vowel.

The grammarians call it a cloſe vowel; becauſe pronounced with the mouth ſhut.

Among the Latins, the O bore ſo great an affinity to the U, that they frequently confounded them; writing *conſol*, and pronouncing *conſul*. See Gruter's Inſcript.

Thus, alſo, they wrote *æquom* for *æquum*, *aorelius* for *aurelius*, *compaſcuos*, *duomvir*, &c.

The Greeks had two O's; *viz.* omicron, ο, and omega, ω; the firſt pronounced with the tip of the lips with a ſharper ſound; the ſecond in the middle of the mouth, with a fuller ſound, equal to *oo* in our language. The long and ſhort pronunciation of our O are equivalent to the two Greek ones; the firſt as in ſuppoſe; the ſecond, as in obey.

O is uſually denoted long by a ſervile *a* ſubjoined, as *moan*; or by *e* at the end of the ſyllable, as *bone*; when theſe vowels are not uſed, it is generally ſhort.

O, among the *Ancients*, was a numerical letter ſignifying eleven; as in the verſe,

"O numerum geſtat, qui nunc undecimus extat."

When a daſh was added at the top, as $\overline{O}$, it ſignified eleven thouſand.

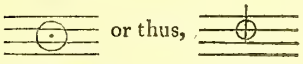
Among the Iriſh, the letter O, at the beginning of the name of a family, is a character of dignity, annexed to great houſes. Thus, in the hiſtory of Ireland, we frequently meet with the *O Neals*, *O Carrols*, &c. conſiderable houſes in that iſland.

Camden obſerves, that it is the cuſtom of the lords of Ireland to prefix an O to their names, to diſtinguiſh them from the commonalty.

A majuſcule O, in *Muſic*, is a note of time, called by us *ſemibreve*, by the Italians, *circolo*, making what they call *tempo perfetto*.

The ancients uſed O as a mark of triple time; from a notion that the ternary, or number three, was the moſt perfect of numbers, and therefore properly expreſſed by a circle, the moſt perfect of figures.

It is not, ſtrictly ſpeaking, the letter O, but the figure of a circle ○, or double CↃ, by which the modern ancients in muſic uſed to expreſs what they call *tempo perfetto*, or triple time. Hence the Italians call it *circolo*. This circle was ſometimes pointed, and ſometimes barred thus,




But theſe equally ſignified a triple time. Broſſard.

The ſeven antiphones, or alternate hymns of ſeven verſes, &c. ſung by the choir in the time of Advent, were formerly called O, from their beginning with ſuch an exclamation.

In the ſtatutes of St. Paul's church in London, there is one chapter, De Faciendo O. Lib. Stat. MSS. f. 86.

O is an adverb of calling, or interjection of ſorrow or wiſhing.

O. NI., in the *Exchequer*. As ſoon as the ſheriff enters into, and makes up his accounts for iſſues, amerciaments, and mean profits; the practice is to mark on his head *O. ni.* which ſignifies, *Oneratur, niſi habeat ſufficientem exonerationem:* and immediately he becomes the king's debtor, and a debet

is ſet on his head.—Upon which the parties become debtors to the ſheriff, and are diſcharged to the king.

OACCO, in *Geography*, a town of Africa, in the kingdom of Benguela; the capital of a province of the ſame name, bordering on Malemba.

OACHATE, a harbour at the ſouth point of the iſland of Ulietea. S. lat. 16° 55′. W. long. 151° 24′.

OAHABA, a river of America, in Louiſiana, which diſcharges itſelf into the Miſſiſippi, in N. lat. 39° 10′, 7 miles N. of Riviere au Beuf.

OAHOONA, the northernmoſt of the cluſter of iſlands called Ingraham iſles; about two leagues N.E. of Nooheeva; called Waſhington by Capt. Ingraham, and Maſſachuſetts by Capt. Roberts.

OAITIPIHA, or AITIPIHA *Bay*, a bay near the N.E. end of the leſſer peninſula of the iſland of Otaheite, with good anchorage in twelve fathoms. S. lat. 17° 46′ 28″. W. long. 149° 13′ 24″.

OAK, in *Botany*, &c. See QUERCUS.

OAK *of Jeruſalem*. See CHENOPODIUM.

OAK-*Tree*, in *Agriculture* and *Planting*, the general name of a well-known hard-wooded foreſt-tree, much cultivated for the purpoſe of timber; particularly in ſhip-building, and in other caſes where much expoſure to the weather is required.

It has many ſpecies, but that which is of moſt importance as a timber-tree is the Engliſh oak, which grows to a great ſtature, and lives to a very great age; and which is deſcribed as being from ſixty to a hundred feet in height, with a very large trunk, a very ſpreading head, oblong leaves, broadeſt towards the top, the edges acutely ſinuated with obtuſe angles.

It has been ſtated by Mr. Marſhall, that "the root of the oak ſtrikes deep, eſpecially the middle or tap-root, which has been traced to a depth nearly equal to the height of the tree itſelf: nor do the lateral roots run ſo ſhallow and horizontal as thoſe of the aſh and other trees; but perhaps the roots of very few trees range wider than thoſe of the oak. The ſtem of the oak is naturally ſhort, and if left to itſelf, in an open ſituation, it will generally feather to the ground. It has not that upright tendency as the aſh, the eſculus, and the pine-tribe: neverthelefs, by judicious pruning, or by planting in cloſe order, the oak will acquire a great length of ſtem; in this caſe, however, it rarely ſwells to any conſiderable girt."

And farther, that "the Engliſh oak admits of ſome varieties: indeed, if we attend minutely to particulars, we ſhall find them almoſt infinite. There is one variegation under the name of the ſtripe-leaved oak: but the moſt intereſting variety of the Engliſh oak is the Lucombe, or Devonſhire oak. In the ſixty-ſecond volume of the Philoſophical Tranſactions, a particular account is given of this oak; ſetting forth that Mr. Lucombe, a nurſeryman near Exeter, having, about the year 1765, ſowed a parcel of acorns ſaved from a tree of his own growth, and obſerving that one of the ſeedling plants preſerved its leaves through the winter, he paid particular attention to it, and propagated, by grafting, ſome thouſands from it. Its being a ſub-evergreen is not the only peculiarity of this variety; it has a ſomewhat more upright tendency, and ſeems to be of a quicker growth than oaks in general. The plants, however, which he has ſeen, do not anſwer altogether the deſcription given in the account abovementioned.

The *Willow-leaved Oak* likewiſe grows to be a large timber-tree. It receives its name from its leaves reſembling very much thoſe of the common willow. Theſe long narrow leaves have their ſurface ſmooth, and their edges entire; their acorns being almoſt covered with their large cups. And it has ſeveral varieties; ſome having ſhorter leaves, others broader, and hollowed on the ſides; ſome large acorns, others ſmaller, &c. all of which are included under the appellation of willow-leaved oaks.

The *Cheſnut-leaved Oak* alſo grows to be a large timber-tree, and in North America, where it grows naturally, the wood is of great ſervice to the inhabitants. It is ſo called becauſe the leaves greatly reſemble thoſe of the Spaniſh cheſnut-tree. They are about the ſame ſize, ſmooth, and of a fine green colour.

There are likewiſe two or three varieties of it; but the leaves of all of them prove that they are of the ſpecies called the cheſnut-leaved oak; ſo that nothing more need be obſerved, than that the leaves of ſome ſorts are larger than thoſe of others; that the acorns alſo differ in ſize, and grow like thoſe of our Engliſh oak, on long or ſhort footſtalks, as it may happen in particular caſes.

The *Black Oak* is a tree of lower growth, ſeldom riſing to more than thirty feet in height. The bark of this tree is of a very dark colour, which occaſioned its being named the black oak. The leaves are ſmooth, very large, narrow at their baſe, but broad at their top, being in ſhape like a wedge: they have indentures at the top, ſo as to occaſion its having an angular look; they are of a ſhining green colour, and grow on ſhort footſtalks on the branches.

And there are varieties of it, particularly with *trifid* leaves, and ſlightly trilobate, called the black oak of the plains, the leaves and cups of all which are ſmall.

The *Red Virginia Oak* grows to be a timber tree of ſixty or ſeventy feet high, and the branches are covered with a very dark coloured bark. It is called the red oak, from the colour of its leaves, which in the autumn decline to a deep red colour.

It has ſeveral varieties, the leaves of which differ in ſize and figure; but thoſe of the larger ſort are finely veined, and exceedingly large, being often found ten inches long, and five or ſix broad. They are obtuſely ſinuated, having angles, and are of a fine green colour in the firſt part of the ſummer, but afterwards change by degrees to red, which marks theſe trees to be of this ſort. There are alſo ſeveral ſubvarieties of it, which exhibit a manifeſt difference in the ſize of the leaves, acorns, and cups. That is the beſt which is commonly called the Virginian ſcarlet oak; and the bark is preferred for the tanners' uſe before that of all the other ſorts.

The *White Oak* does not grow to the ſize of the former, ſeldom being found higher than forty feet, even in Virginia, where it grows naturally. But though the timber is not ſo large, yet it is more durable, and conſequently of greater value for building to the inhabitants of America, than any of the other ſorts. The branches of this tree are covered with a whitiſh bark; the leaves alſo are of a light colour. They are pretty large, being about ſix inches long, and four broad: they have ſeveral obtuſe ſinuſes and angles, and are placed on ſhort footſtalks.

This has a variety or two, and the acorns are like thoſe of our common oak.

The *Italian Oak* grows to about the height of thirty feet; the branches are covered with a dark purpliſh bark. The leaves are ſmooth, and ſo deeply ſinuated as to have ſome reſemblance of pinnated leaves; and each has a very ſhort footſtalk. The fruit of this ſpecies ſits cloſe to the branches. The cups are in ſome degree prickly and rough, and each contains a long ſlender acorn, that is eatable. In the places

where theſe trees grow naturally, the acorns are, in times of ſcarcity, ground into flour, and made into bread.

The *Spaniſh Oak* grows to be as large a tree as our common oak, and is in no way inferior to it in ſtatelineſs and grandeur; for the branches will be far extended all around, cauſing, with the leaves, a delightful ſhade. Though the bark of theſe branches is of a whitiſh colour, yet they are nevertheleſs ſpotted with browniſh ſpots. The leaves are of an oblong-oval figure, but not very long, ſeldom being longer than three inches, and two broad. They are ſmooth, and have their edges deeply ſerrated: theſe ſerratures are acute, and chiefly turn backwards. Their upper ſurface is of a fine light green colour, and their under of an hoary caſt; and with theſe beautiful leaves each branch is plentifully ornamented all over the tree. The cups are moſt peculiar and ſingular; for they are very large, and compoſed of ſeveral rough, black, large ſcales, that lap over one another like the ſcales of a fiſh. They almoſt cover the acorn, though they are pretty large, narrow at the bottom, but broader higher, and have their top flat. The acorns are uſed in dyeing.

The *Auſtrian Oak* is of lower growth than the preceding ſpecies, ſeldom riſing more than forty feet high. The leaves are of two colours; their upper ſurface being of a fine green colour, and their under downy. Their figure is oblong; but they are ſo indented about the middle, as to make them have the reſemblance of a lyre. They are wing-pointed, tranſverſely jagged, and ſtand on ſlender footſtalks on the branches. The cups of this ſort alſo are ſmaller and prickly, and the acorns proportionally ſmaller than thoſe of the preceding part.

It may be noticed, that there are ſome other ſorts mentioned by writers on rural economy; but they are not of much conſequence to the planter or timber dealer.

*Manner of raiſing the Plants.*—Theſe, in all the ſorts of oaks, are raiſed from the ſeeds or acorns, which ſhould be ſown as ſoon as poſſible after they are ripe; for if they are kept too long out of the ground, they ſeldom grow at all.

And the manner of ſowing the acorns, if deſigned for a ſmall plantation, or to be removed, is to prepare ſome beds of freſh earth, neither too ſtrong and heavy nor too light and dry. In theſe beds the acorns ſhould be placed in rows one foot aſunder, and about two inches diſtance in the rows, covering them about two inches thick with the ſame freſh earth. In the ſpring, when the plants begin to appear, they muſt be carefully cleared from weeds; and if the ſeaſon proves dry, refreſhed now and then with a little water, which greatly promotes their growth. In theſe beds the plants ſhould remain until the following autumn, obſerving conſtantly to keep them clear from weeds; at which time, a ſpot of good freſh earth, in ſize proportionable to the quantity of the plants, ſhould be trenched and levelled for preſerving them: then towards the middle or latter end of October, the plants ſhould be carefully taken up, ſo as not to injure their roots, and be planted out in rows three feet aſunder, and eighteen inches diſtance plant from plant; obſerving never to ſuffer the plants to abide long out of the ground before they are planted, as their roots would dry, and endanger their growth. And when they are planted, a little littery dung ſhould be laid upon the ſurface of the ground, near the roots, to prevent the earth from drying too faſt; and if the ſeaſon ſhould prove very dry, little water ſhould be given to ſettle the earth to their roots.

As ſoon as the plants have taken root, they will require little more care than to keep them clear from weeds, and dig the ground between the rows every ſpring; in doing of which, ſuch roots as extend very far from the trunk of the trees ſhould be cut off, which will render them better for tranſplanting again: alſo prune off ſuch ſide-branches as extend themſelves very far, and would retard the upright ſhoot; but not by any means all the ſmall lateral branches, ſome of which are abſolutely neceſſary to be left in, to detain the ſap for the augmentation of the trunk: for, where trees have been thus cloſely pruned, their heads have overgrown their bodies, ſo that they have bent downward, and become crooked.

After theſe trees have remained in the nurſery three or four years, they will be large enough to tranſplant to the places where they are to remain: for it is not proper to let them grow very large before they are planted out, as they are very hazardous trees to remove when old, or after they have taken deep root.

The beſt ſeaſon for this work is in the autumn; at which time, if they are carefully taken up, there will be little danger of their ſucceeding. When they are planted, the ſurface of the ground ſhould be littered about their roots, to prevent its drying too faſt; and if the ſeaſon is very dry, they ſhould be watered, to ſettle the earth to their roots, which may be repeated two or three times in very dry weather: but carefully avoid giving them too much water, which is very injurious to theſe trees, when newly removed. They ſhould alſo be ſtaked, to prevent their being ſhaken and diſturbed by the winds, which would retard their rooting. In tranſplanting of the trees, by no means cut their heads, which is too much practiſed: all that ſhould be done is to cut off any bruiſed or ill-placed branches, which ſhould be taken off cloſe to the place where they are produced. But there can be no greater injury done to theſe trees than to ſhorten their ſhoots; for when the leading bud, which is abſolutely neceſſary to draw and attract the nouriſhment, is taken off, the branch often decays entirely, or, at leaſt, down to the next vigorous bud. The trees, thus raiſed and managed, when planted in a proper ſoil, grow to a conſiderable magnitude, and are very proper for a wilderneſs in large gardens, or to plant in clumps in parks, &c. The directions here given are, however, deſigned only for ſmall plantations, in places which are only for pleaſure.

*Raiſing Oaks for Timber.*—In caſes where theſe trees are cultivated with a view to profit in timber, the acorns ſhould be ſown where the trees are deſigned to grow: in order to which, provide in autumn a ſufficient quantity of acorns, which ſhould be always taken from ſtraight, upright, vigorous growing trees. Theſe ſhould be gathered from under the trees as ſoon as may be after they are fallen, and, if poſſible, in a dry time; laying them thin in ſome open room to dry. Thoſe which are tranſplanted will never grow to the ſize of thoſe which ſtand where they are ſown, nor will they laſt near ſo long ſound: for in ſome places, where theſe trees have been tranſplanted with the greateſt care, and have grown very faſt for ſeveral years after, they are now decaying; while thoſe which remained in the places where they came up from the acorns are ſtill very thriving, and have not the leaſt ſign of decay: therefore, whoever deſigns to cultivate theſe trees for timber, ſhould never think of tranſplanting them, but ſow the acorns on the ſame ground where they are to grow; for the timber of all thoſe trees which are tranſplanted is not near ſo valuable as that of the trees from acorns. In this buſineſs, the firſt thing to be done is that of fencing the ground very well, in order to keep out cattle, hares, and rabbits; for if theſe animals can get into the ground, they ſoon deſtroy all the young trees. In a few years, the trees grow to be out of danger from the hares and rabbits; but it will be many years before they be paſt injury from the cattle, if they are permitted to get into

the plantation: therefore, durable fences ſhould be put round the ground. If, in the beginning, a pale fence is made about the land, cloſe at the bottom, and open above, and within it a quick hedge planted, the latter will become a good fence, by the time the paling decays, againſt all ſorts of cattle; and when the trees will have got above the reach of hares and rabbits, ſo that they cannot injure them.

As ſoon as the ground has been well fenced in, it ſhould be prepared by ploughing it three or four times; and after each ploughing, harrowing it well to break the clods, and cleanſe the ground from couch, and the roots of all bad weeds. If the ground is broken up from the green ſward, it will be better to have one crop of beans, peaſe, or turnips, off the ground, before the acorns are ſown, provided theſe crops are well hoed, to ſtir the ſurface, and deſtroy the weeds. If this is properly done, the crop will improve the land for ſowing; but in this caſe, the ground ſhould be ploughed as ſoon as poſſible after the crop is taken off, the acorns being ſown as ſoon as they can after they are ripe: for although they may be preſerved in ſand for ſome time, they will be apt to ſprout, by which the ſhoots are in danger of being broken and ſpoiled. And in making choice of acorns, thoſe ſhould be preferred which are taken from the largeſt and moſt thriving trees; but thoſe of pollard trees always rejected, though the latter are generally the moſt productive of acorns. Thoſe obtained from the large trees commonly produce the ſtrongeſt and moſt thriving plants.

*Sowing the Acorns.* — The ground having been thus ploughed, levelled, and brought into order, the acorns ſhould be ſown in drills made acroſs the ground, at about four feet aſunder, and two inches deep; being ſcattered in at two inches diſtance. Theſe drills may be drawn either with a drill-plough, or by hand, with an hoe; but the former is the moſt expeditious method; therefore, in large plantations, ſhould be preferred. In the drawing of the drills, if the land has any ſlope to one ſide, theſe ſhould be made the ſame way as the ground ſlopes, that there may be no ſtoppage of the wet by the rows of the plants croſſing the hanging of the land. This ſhould be particularly obſerved in all wet ground, or where the wet is ſubject to lie in winter. When the acorns are ſown, the drills ſhould be carefully filled in, ſo as to cover the acorns ſecurely; for if any of them are expoſed, they will entice the birds and mice; and if either of theſe once attack them, they will make great havock and deſtruction. The reaſon for directing the drills to be made at this diſtance, is for the more convenient ſtirring of the ground between the rows, to keep the young plants clean from weeds; as, if this is not carefully done, it cannot be expected that the young plants ſhould make much progreſs; and yet this is generally neglected by many who pretend to be great planters, who are often at a large expence to plant, but ſeldom regard them after; ſo that the young plants have the difficulty to encounter the weeds, which frequently are four or five times the height of the plants, and not only ſhade and draw them, but alſo exhauſt all the goodneſs of the ground, and conſequently ſtarve the plants; therefore, whoever hopes to have ſucceſs in their plantations of this ſort, ſhould determine to be at the expence of keeping them clean for eight or ten years after ſowing, by which time the plants will have obtained ſtrength enough to keep down the weeds; the neglecting of this has occaſioned many young plantations to miſcarry. About the end of March, or beginning of April, the young plants will appear above ground; but before this, if the ground ſhould produce many young weeds, it will be good huſbandry to ſcuffle the ſurface over with Dutch hoes, in a dry time, either the latter end of March, or the beginning of April, to deſtroy the weeds, whereby the ground will be kept clean, until all the plants are come up ſo far as to be plainly diſcerned; by which time it may be proper to hoe the ground over again; for by doing it early, while the weeds are ſmall, a man will perform more of this work in one day than he can in three or four when they are grown large; beſides, there will be great hazard of cutting off or injuring the young plants, when they are hid by the weeds; and ſmall weeds, being cut, are ſoon dried up by the ſun, but large weeds often take freſh root, and grow again, eſpecially if rain ſhould fall ſoon after, and then they will grow faſter for being ſtirred; therefore it is not only the beſt method, but alſo the cheapeſt huſbandry to begin cleaning early in the ſpring, and to repeat it as often as the weeds are produced. In the firſt ſummer, while the plants are young, it will be the beſt way to perform theſe hoeings by hand; but afterwards it may be done with the hoe-plough; for as the rows are four feet aſunder, there will be room enough for this plough to work; and as this will ſtir and looſen the ground, it will be of great ſervice to the plants; but there will require little hand labour where the plough is uſed, in order to deſtroy the weeds, which will come up in the rows between the plants; for theſe will be out of reach of the plough, and, if they are not deſtroyed, they will ſoon overgrow and injure the young plants.

As ſoon as the plants have had two years' growth, it will be proper to draw out ſome of them, where they are too cloſe; in doing which, great care ſhould be had not to injure the roots of thoſe that are left; for as the plants which are drawn out are only fit for plantations deſigned for pleaſure, ſo theſe ſhould not be ſo much regarded in their being moved, as to ſacrifice any of thoſe which are deſigned to remain. In theſe thinnings the plants at firſt ſhould be left about one foot aſunder, which gives them room enough to grow two or three years longer; by which time it may be eaſy to judge which are likely to make the beſt trees. Theſe may be then fixed on, as ſtandards, to remain; though it will be proper to have a greater number at this time marked than can be permitted to grow, becauſe ſome of them may not anſwer the expectation; and, as it will be improper to thin theſe trees too much at one time, ſo the leaving double the number intended at the ſecond thinning will not be amiſs. If they are left at about four feet diſtance in the rows, they will have room enough to grow three or four years longer; by which time, if the plants have made good progreſs, their roots will have ſpread over the ground, when it will be proper to take up every other tree in the rows. But, by this, it is not meant to be exact in the removing, but to make choice of the beſt plants to ſtand, whichever rows they may be in, or if they ſhould not be exactly at the diſtance here aſſigned. When the plants have been reduced to the diſtance of about eight feet, they will not require any more thinning. But in two or three years time, thoſe which are not to remain will be fit to cut down, to make ſtools for underwood, and thoſe which are to remain, will have made ſuch progreſs as to become a ſhelter to each other; for this is what ſhould principally be attended to, whenever the trees are thinned; therefore, in all ſuch places which are much expoſed to the wind, the trees ſhould be thinned with great caution, and by ſlow degrees; for if the air is let too much at once into the plantation, it will give a ſudden check to the trees, and greatly retard their growth; but, in ſheltered ſituations, there need not be ſo great caution uſed as in thoſe places; the plants will not be in ſo much danger of ſuffering from expoſure to the cold winds.

The proper diſtance which ſhould be allowed to thoſe trees which are deſigned to remain for timber, is from twenty-

twenty-five to thirty feet, or more, which will not be too near, where the trees thrive well; in which caſe their heads will ſpread, ſo as to meet in about thirty, or thirty-five years; nor will this diſtance be too great, ſo as to impede the upright growth of the trees. This diſtance is intended that the trees ſhould enjoy the whole benefit of the ſoil.

And after one crop of the underwood, or, at the moſt, two are cut, the ſtubbing up the ſtools is adviſed, that the ground may be entirely clear, for the advantage of the growing timber, which is what ſhould be principally regarded; but, in general, moſt planters have more regard for the immediate profit of the underwood than the future good of the timber, and, frequently, by ſo doing, ſpoil both; for, if the underwood is left after the trees are ſpread ſo far as that their heads meet, the underwood will not be of much worth; and yet by their ſtools being left, they will draw away a great ſhare of the nouriſhment from the timber trees, and retard them in their progreſs very conſiderably.

*Quality of Soil.*—The ſoil in which the oak makes the greateſt progreſs, is uſually a deep rich loam, in which the trees grow to the largeſt ſize; and the timber of thoſe trees which grow upon this land, is generally more pliable than that which grows on a ſhallower or drier ground; but the wood of the latter is much more compact and hard. Indeed there are few ſoils in which the oak will not grow, provided there be proper care taken in their cultivation; though this tree will not thrive equally in all ſoils; but yet it might be cultivated to a national advantage upon many large waſtes in many parts of the kingdom, as alſo to the great profit of the eſtates where theſe tracts of land now lie uncultivated, and produce nothing to the owner; as, ſhould the preſent practice of deſtroying this ſort of timber continue, and little care be taken to raiſe a future ſupply; this country, which has been ſo long eſteemed for its naval ſtrength, may be obliged to ſeek for timber abroad.

In ſpeaking of the culture of the oak, Mr. Yates has ſtated that an opinion is generally prevalent, that the oak is particularly ſlow in its growth, and requires a great number of years before it affords any advantage. This idea too often deters from planting, on account of the very great length of time it is ſuppoſed the land muſt be occupied before any return of valuable produce can be obtained from it, after a conſiderable expence may have been incurred in forming plantations. But this opinion he conſiders as entirely founded in error, and to have taken its riſe in a great meaſure from the want of proper management which has hitherto commonly prevailed in the raiſing of oaks. It is conceived, however, on the ground of experience, that the oak may be rendered very rapid in its growth, and that conſequently land may be employed to great advantage in its cultivation, as a very conſiderable and profitable produce may, in a much ſhorter time than is generally ſuppoſed, be derived from proper parts of an eſtate thus employed. And that oak-timber in this country, for the moſt part, appears in trees of a conſiderable extent of head, but ſeldom more than twenty or thirty feet in ſtem; and this, in many inſtances, the growth of a century. Now, by the courſe of management here propoſed, it is conceived that trees, of at leaſt double this magnitude, may be obtained in about half that time; but it is not his intention to attempt a proof of this propoſition by theoretical deductions, but to appeal for its confirmation to the indubitable teſt of fact, which, from the event of repeated trials, impreſſes a conviction, that experience will be found to ſupport and eſtabliſh in the moſt unequivocal manner. And in proof of this it is ſtated that the oak, in the progreſs of its growth, ſpreads numerous roots near the ſurface of the ground, and in an horizontal direction; theſe aſſiſt in ſupporting and preſerving the tree in its poſition, but ſeem to contribute very little to its increaſe and magnitude. The oak appears to derive its chief nutriment and ſtrength from a root that always deſcends at right angles to the horizon, and is called the tap-root. The firſt thing, therefore, to be obſerved, is, that upon a judicious attention to this peculiarity, the planter's ſucceſs principally depends; and the neglect of this care is the conſtant ſource of error and diſappointment. In all climates, and upon all ſoils, to preſerve this tap-root from injury, and as much as poſſible to aſſiſt its growth, is, he conceives, a general, and indeed the moſt eſſential principle in the cultivation of oak. With a due regard to this circumſtance, the management of a plantation may be reſolved into the three following practical directions:

1. Previouſly to planting the acorns, looſen the earth intended for their reception, by deep trenching.

2. Never tranſplant, or in any way diſturb the ſaplings intended for timber.

3. Keep the plant carefully pruned, till arrived at a proper height.

In order more fully to elucidate the ſubject, and to prevent the poſſibility of miſapprehenſion, it may be proper to give a more detailed ſtatement. And that in determining on a ſpot to form a plantation of oaks for timber, it muſt always be recollected that the plants are to remain without removal in their firſt ſituation: the clearing and fencing may then be attended to as uſual; and in the courſe of the winter, from September to March, the particular ſpots intended for the reception of acorns, be prepared for that purpoſe, by digging a trench about three feet in width, and from three to ſix feet in depth, according to the cloſeneſs and tenacity of the ſoil. If graſs ground, the firſt ſpit ſhould be placed at the bottom of the trench; and if more than one trench be neceſſary, they ſhould be prepared in the ſame manner, preſerving a diſtance of ten yards between each, if it be intended to employ the intermediate ſpace in underwood, or for any other purpoſe. Then having made a careful ſelection of acorns that are perfectly ſound, and in good preſervation, they are to be planted about the middle of March. For this purpoſe it is adviſed to draw a drill in the centre of the trench; two inches in depth, if the ſoil be heavy and loamy; but three inches in a light and ſandy earth: and in this caſe to place the acorns two inches aſunder, and cover them carefully with mould. When the plants appear, they muſt be weeded by hand in the rows, and the earth of the trench round them cleaned with a hoe, once a month during the ſummer. In October it is ſuppoſed neceſſary to inſpect the rows, and thin them by pulling up every other plant: attention will of courſe be paid to remove the weak and crooked plants, and leave thoſe that are talleſt and ſtraighteſt. In the ſecond year, the operation of thinning muſt be repeated, at the ſame time and in the ſame manner; and, ſhould any of the remaining plants have made ſide-ſhoots ſtronger than the general character, they muſt be ſmoothly cut off with a ſharp knife, cloſe to the leading ſtem. In the third year the thinning is again to be repeated, and the general pruning commenced, by cutting off cloſe to the leading ſtem all the ſide-ſhoots of the firſt year; thus leaving the branches of two years to form the head of the following year. The removal of every alternate plant muſt be continued yearly, till the trees are about thirty feet apart, at which diſtance they may remain for timber. The pruning is to be continued, by removing every year, very ſmooth and cloſe to the main ſtem, one year's growth of ſide branches, till the plants are arrived at

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a ſtem of forty, fifty, or ſixty feet, and they may then be permitted to run to head without further pruning. But the particular arrangement here recommended may be varied according to any peculiarities of ſituation, regard being conſtantly had to the general and moſt important principle of looſening the ground very deep previouſly to planting the acorns. By this mode of culture, oaks may be raiſed in almoſt any ſoil; but, where it is poſſible, a loam or marle is always to be choſen. Oaks thrive much the beſt in ſuch earth; and when aſſiſted by deep trenching and judicious pruning, attain in a few years to an immenſe ſize. It is added that thoſe who have been accuſtomed to notice the ſlow growth and ſtunted appearance of oak-trees, when denied the aſſiſtance of art, and left to themſelves in the common way, would obſerve with aſtoniſhment the vigorous and rapid increaſe of plants under the management here pointed out. And further, that the plants thinned out the firſt three or four years, though not fit to be depended upon for timber, as tranſplanting generally injures materially the future growth, may be replanted in the intermediate ſpaces between the rows, for the purpoſe of being afterwards removed; or they may be uſefully placed in hedges, or other ſpare and unoccupied ſpots of ground. They ſhould be headed down at the time of tranſplanting, as this operation aſſiſts the proceſs of nature, in reproducing or remedying any injury the tap-root may have received from the removal: and if proper attention be given to looſening the ſoil for their reception, and pruning them as they advance, in moſt inſtances an adequate profit will be derived from the labour beſtowed upon them. After a few years, the produce of the timber plantation will be found very advantageous. The young trees that are to be removed yearly, will always find a ready market for a variety of purpoſes, unneceſſary here to enumerate. And in addition to theſe advantages by this treatment of deep trenching previous to planting, and annual careful pruning during the growth, timber can be produced in about fifty years of equal quality, and much ſuperior in ſize to that which has been above one hundred years growing under improper management, or without the aſſiſtance of cultivation; it will doubtleſs be allowed that a moſt beneficial, if not abſolutely the beſt poſſible method of raiſing oaks, is here pointed out and aſcertained. But this method of cultivation may perhaps be thought to occaſion ſo much expence in manual labour as to prevent its being generally adopted: it might perhaps be ſufficient to obſerve, that if the work be conducted with judgment and economy, the future produce would afford ample returns for all neceſſary expenditure: it ſhould alſo be recollected, that the previous preparation of the ground, and the ſubſequent pruning of the plants, are both to be performed at that ſeaſon of the year when a ſcarcity of work will enable the planter to obtain aſſiſtance upon eaſier terms; with this additional advantage alſo, of providing employment for the labourer at thoſe times when the general ſtate of agricultural buſineſs renders it difficult for him to find maintenance for himſelf and family without charitable relief.

In ſupport of this practice it is ſtated, that in 1750, at Ingeſtrie in Staffordſhire, the ſeat of lord Chetwynd, ſome plantations were formed and managed in a great meaſure according to theſe principles, and the growth of the plants was ſo uncommonly rapid, and ſo extraordinary, that it could not but attract the notice of all concerned in the conduct of them.

On the whole it is concluded, from the ſtatements made here, and from what may be ſeen in every part of the kingdom, in the character and appearance of oaks growing without cultivation, that it ſeems aſcertained, that acorns ſet with the ſpade or dibble, without digging or tillage, can never be depended on to form good timber; and even in the moſt favourable circumſtances of this caſe, the growth will be exceedingly ſlow and precarious. The ſame may be ſaid of young plants, previouſly raiſed in nurſeries and tranſplanted; for if the tap-root be cut, broken, or in any degree injured, which in tranſplanting it is almoſt impoſſible to avoid, that plant will ſeldom become a vigorous and flouriſhing tree.

Tranſactions of the Society for the Encouragement of Arts, &c. vol. xx. and the facts recorded by Mr. Majendie in the ſame Tranſactions, ſtrongly confirm the propriety of the above principles and practice. It is there ſtated that he planted five thouſand three hundred oaks in two ſeparate incloſures, and that the firſt plantation, containing four thouſand ſix hundred oaks, was formed on part of the ancient Home Park, ſurrounding the caſtle: the ſoil was dug one full ſpit, and the turf inverted; the plants were two-years old ſeedlings, removed with the greateſt care from the ſeed-bed, by undermining the roots; ſo as to bring them up undamaged and entire in the ſtricteſt ſenſe: the ſub-ſoil of the intended plantation being a rich tender loam, holes were bored into it with an iron inſtrument, uſed in the country for fixing hop-poles into the earth: into theſe the trees were planted, uſing great caution that each ſeedling ſhould have a hole ſuitable to the length of its tap-root, which they were careful to ſet upright, and without doubling it: the tap-roots of theſe plants were from eighteen to thirty-ſix inches in length. His motives for planting the trees without ſhortening their tap-roots, were theſe: it has long been aſſerted, that the oak ſuffers greatly in value from tranſplanting, and that the timber of ſuch trees is of an inferior quality to that produced by ſowing the acorn. Theſe facts were long ſince well known to Millar and Hanbury. It is further ſtated, that a common practice in planting oaks, is to ſow the acorns in a bed; and, after one or two years to tranſplant the ſeedlings into rows in a nurſery, where they remain two or three years longer; when the young trees are taken up, and their tap-roots, being previouſly ſhortened, are finally planted out. Now by this proceſs, it is plain the tree undergoes two removals before it is finally planted. To avoid this, he determined to plant out his oaks at once from the ſeed-bed, with an idea that, by their receiving only one check inſtead of two, and this at ſo early an age, they would ſoon recover it, ſo as in the end to ſuffer no ſort of detriment; more particularly as by preſerving their tap-roots entire, the trees were planted as much as poſſible in a natural ſtate. And that, with ſome it is not unuſual to plant out young oaks immediately from the ſeed-bed, but they are for the moſt part *tapped* at the time of removal; or, this operation is previouſly effected by an inſtrument introduced beneath the ſoil that divides the root, whilſt the tree is ſtill growing: after which it is ſuffered to remain in the ground ſeveral years before it is finally removed: but in both theſe inſtances the intentions of nature in reſpect to this tree ſeem to be violated.—Would it not be preferable, upon all occaſions of tranſplanting, with a view to timber, to remove the trees at as early an age as poſſible, and without any mutilation, from the ſeed-bed to the ſoil where they are to grow? By which, if the ſeminary (as it ever ſhould be) is at no great diſtance from the land intended to be planted, and that the eſſential requiſite of taking up the trees with the utmoſt care is attended to, the removal will be hardly, if at all, felt: and, at all events, until the queſtion is decided, whether it is beſt, in order to

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procure timber of the firſt quality, to ſow acorns where they are to remain, or to tranſplant oaks, it is but reaſonable that the practice of tranſplanting (generally conſidered as inferior to that of ſowing) ſhould be conducted with as few deviations from nature as poſſible.

It is ſuggeſted, that at the time of forming this plantation (December 1786), he made the following experiments, with a view to a compariſon between young oaks planted with their roots entire, and thoſe whoſe roots had been *tapped*. On the 5th of that month, he ſelected from his ſeedling-oaks twenty-four of the ſtraighteſt, and which were of an equal length, namely, three feet ſix inches from the extremity of the tap-root to the top of the plant, the root alone being twenty-ſeven inches, and the plant fifteen inches in length; twelve of theſe were planted in the ſame manner as the reſt of the oaks in the enclоſure with entire roots, and at the diſtance of five feet from each other: contiguous to theſe, and at the ſame time and diſtance, the remaining twelve were planted, taking off previouſly eighteen inches from their tap-roots, ſo that nine inches only of root remained. And as he wiſhed to obſerve the progreſs of theſe trees, at the expiration of a few years; on the 6th of December 1791, he cauſed one of each to be carefully dug up, which he found in the manner deſcribed below.

But it is not pretended at preſent to draw any accurate concluſion from this experiment; for indeed it muſt require long experience, and a courſe of years, to form decided opinions concerning a tree of ſuch ſlow growth as the oak. He purpoſes, however, continuing his remarks upon theſe trees thus experimentally planted, by digging up others from time to time, in order to obſerve the comparative progreſs of their roots. His intention in thus planting theſe trees, and remarking at various periods the degrees of difference between their growths, was with a view of aſcertaining hereafter, whether the planting of perfect oak ſeedlings, without dividing their tap-roots, might not be the means of inſuring better timber than by the uſual method of planting thoſe which have been previouſly *tapped* for admitting the oak, from the unremoving acorn, in all caſes, to arrive at a ſuperiority of timber to that of the tranſplanted tree, at however early an age it is removed: ſtill, as long as the practice of tranſplanting oaks is in uſe, it may be preſumed that a ſeedling removed with proper care from the ſeminary, and planted entire, will prove ſuperior to one whoſe root has been mutilated; as having ſuſtained in its treatment a leſs deviation from nature. For that, in the perfect tree, alluded to above, the tap-root has acquired a regularity of thickneſs in its general growth, and that its lateral ſhoots are moſtly fibrous; becauſe the tree, having remained in poſſeſſion of its natural ſource of nouriſhment, was enabled, ſoon after being tranſplanted, to vegetate as before: on the other hand, the mutilated tree has thrown out a number of thick woody horizontal roots near the place where the tap-root was ſhortened, as if nature, to preſerve her produce, had been intent on repairing the damage ſhe had ſuſtained; after which, the root reſumes its natural downward tendency, with a regularity that might almoſt induce an idea that the root had never been at all divided. But, to remove the moſt diſtant doubt on this head, others of theſe trees have been taken up, in which, after the moſt careful examination, the ſame diſtinct modes of growth appear, as in theſe. It may be farther remarked, that theſe trees have not ſucceeded ill with him, when it is conſidered they have only been planted five years, and were at that time only fifteen inches in height from the ground.

It is ſtated that, on digging up the trees the following were the

Admeaſurements of each:

*Oaks planted with an entire Root.*

| | Feet. | Inches. |
|---|---|---|
| Extreme height from the bottom of the tap-root | 11 | 2½ |
| Height from the ground | 7 | 7 |
| Circumference cloſe to the ground | 0 | 6¼ |

*Oaks planted with a tapped Root.*

| | Feet. | Inches. |
|---|---|---|
| Extreme height from the bottom of the tap-root | 10 | 3 |
| Height from the ground | 6 | 9 |
| Circumference cloſe to the ground | 0 | 6½ |

This planter could have ſelected larger trees from his plantation, but preferred the above for the ſake of accuracy, as they were both planted the ſame day.

And it is ſtated that the ſecond incloſure, at ſome conſiderable diſtance from the former, and part of the ancient great park of the eſtate, was planted with ſeven hundred oaks; and has in all reſpects received a ſimilar treatment with the firſt. Both plantations are ſecurely fenced, and in a very flouriſhing condition, the trees ſeeming ſuited to the ſoil. They have been carefully attended, and judiciouſly pruned; whereby they have acquired an upright growth, which, together with their being planted tolerably thick, will enſure a length of ſtem. And it is concluded that, under a continuation of the preſent treatment, he can have no room to doubt the future ſucceſs of the plantations. In fact, theſe different ſtatements clearly demonſtrate the great advantage of the method of ſowing the acorns in the ſituations where the trees are to remain, and that where this cannot be done, the next beſt mode is that of removing the plants when young, with their tap-roots entire. It is obvious likewiſe, that, where theſe trees are cultivated on an extenſive ſcale, the land may be well prepared by means of the trenching plough with much leſs expence and with greater convenience than by manual labour in moſt caſes.

In Mr. Smith's trials in Yorkſhire, much advantage has been found from the young oaks having ſhelter afforded by firs which have obtained a year's growth, as in a plantation made in 1792, and which was laſt year joined to this, by another piece of land about three acres then taken in. The oaks were there ſet at the ſame time as the firs, but on one part were not mixed with them; and in that part they thrived ſo ill, as to make no progreſs, until ſome Scotch firs were planted among them; ſince which they have aſſumed a different appearance, and are now growing tolerably well. But another advantage he has obſerved in planting, ariſes from having the holes made the year before the plants are put in: by this method the froſt ameliorates the ſod, and makes it, particularly in bad land, finer, which encourages the fibres of the young plants to ſhoot more freely. It is noticed that two lands in his plantation were not ploughed; and the reaſon that induces him to mention the circumſtance, is the ſuppoſition that the trees would grow beſt upon the land that was ploughed. In this he has not been diſappointed; thoſe that were ſet upon the two lands not ploughed, having made leſs ſhoots than the other; and though they grow tolerably well, yet an evident difference is obſervable in the luxuriancy of their appearance,

pearance, which certainly is an additional proof that ploughing the land, and making the holes the year preceding the planting of trees, is of material conſequence in the ſucceſs of an undertaking of this nature. This is the caſe, not only with the oaks, but other ſorts of timber trees in general.

Mr. Nichol has contended that nothing aſſiſts more in the propagation and preſervation of timber than thorns and buſhes, eſpecially where there are no fences to keep off cattle. Underwood never fails to bring a ſtock of timber on a favourable ſoil: and the deſtruction of buſhes in lands not incloſed, will aſſuredly prevent a ſucceſſion of timber, by depriving the young plants of their nurſes, and leaving the acorns that are caſually dropped expoſed to various enemies. The conſtant cutting, therefore, of underwood by the keepers in foreſts, under pretence of browſe for the deer, is attended with the moſt miſchievous conſequences to the growth of timber. The unlimited mowing of fern is alſo extremely injurious to the growth of timber; for the fern ſhades the roots, and keeps the young plants moiſt and cool: and by cutting it up, the young trees are cut up with it as ſoon as they ariſe. On this ground, he adviſes the making plantations without any previous preparation, as being the cheapeſt, and anſwering the purpoſe extremely well. This may be an uſeful mode in foreſts, and waſtes full of buſhes. He has invented a good inſtrument for introducing and planting acorns among the buſhes. But in raiſing a new wood, it muſt be much more effectual to prepare and clean the ground well, and to ſet the acorns in drills, that the young plants may be kept clean by horſe-hoeing till they can bid defiance to weeds and other annoyances.

In ſpeaking of the compariſon between ſown and planted oaks, Mr. Plampin, of Chadacre, in Suffolk, affirms, that the latter are ſo inferior to the former, as to induce him to give a general condemnation of planting for timber. But Mr. Marſhall endeavours to reconcile the diſpute about ſowing and planting, by obſerving that where the ſtrength of the lands lies in the ſubſtratum, while the ſurface of the ſoil is of an ungenial nature, we ſhould ſow, in order that the roots may ſtrike deep: but on the contrary, when the top ſoil is good, and the bottom of an oppoſite quality, to plant, and thereby give the roots the full enjoyment of the productive part of the ſoil; or, under theſe laſt circumſtances, ſow, and tap the young plants as they ſtand, and thereby check their downward tendency, as well as ſtrengthen their horizontal roots. And it has been remarked, that in raiſing oaks for timber, draining ſhould be well attended to; nothing contributing more to their growth and health, than keeping the land dry, if it is in the leaſt inclinable to be ſwampy or retentive of moiſture.

In the ſecond volume of the Rural Economy of Norfolk, oaks are obſerved to grow beſt, and make the fineſt plants and the moſt beautiful trees, when they are raiſed undiſturbed from the acorn. The oak having naturally a ſtrong tap-root, it is almoſt certain death to remove a large plant which has not been tranſplanted or tapped whilſt young: nevertheleſs, if the tap-root has been properly taken off from the ſeedling plant, it may afterwards be removed at pleaſure, with ſafety. Oaks may, however, be tapped by taking up the plants and taking off the tap-root with a knife, or it may be done as they ſtand, with a tapping-iron, or even a common ſpade ground to an edge. This, being introduced at a proper depth beneath the ſurface of the ground, cuts off the tap-root; leaving the principal part of the lateral horizontal fibres undiſturbed. When the plants have got large (four or five years old for inſtance), this is perhaps the ſafeſt way of treating them; for the lateral ſhoots in this caſe receive no check whatever, but continue to throw up a regular ſupply of ſap to the plant: whereas, by taking them up and removing them into a freſh ſituation, they are ſeveral days before they begin to work; in which time the plant may receive irrecoverable injury.

It is ſtated, that a ſeed-bed of oaklings, five years old, was treated in this manner; in March and April the planter tapped them all with common ſpades, ground ſharp; pruned ſuch as were in any degree ſtraight; and headed down the reſt near the ground, to throw out ſhoots to be trained. Not a plant is dead. Had there been more of them cut down the effect would have been ſtill better. And a ſtriking inſtance of ſucceſs in tranſplanting large oaks for ſtandards, occurs on Gunton Common. Scarcely a plant, of ſome thouſands, has miſcarried, and there are very few which do not flouriſh. A perſon who had ſome ſhare in the buſineſs of this plantation, tells him that it was the employment of two men and a couple of horſes, almoſt all the firſt ſummer after they were planted, to water them; not by a pailful, but by a hogſhead at once; which ſerved for the ſummer. This was a rational method; a pailful only tantaliſes and baulks the plant; whereas a hogſhead depoſited at its root affords a natural and regular ſupply, to be drawn up leiſurely by the ſun during the courſe of the ſummer. It is likewiſe obſerved, that upon ſome eſtates it is the practice to put in, when a new hedge is planted, a holly at every rod, and an oak plant at every two or three rods, among the white-thorn layer. This is an excellent practice, provided the young oaks be trained to a proper height before they be ſuffered to form their heads. For, in this caſe they will become a valuable ſource of timber, without injuring, in any material degree, the incloſures they grow between. They are the roots of the aſh and elm, and the tops of low pollards and tall overgrown hedge-woods, which are injurious to the farmer. A timber-oak, of from fifteen to twenty feet ſtem, does very little, if any, injury either to the crop, or the hedge growing under it. But if, on the contrary, the oaklings thus planted be ſuffered to riſe with more than one ſtem, as ſtubwood, or ringly (which is ſeldom the caſe in a young hedge), they be permitted to form their heads at eight or ten feet high, with flat wide ſpreading tops, they loſe their intended value, and become nuiſances, not only to the adjoining incloſures, but to the hedge in which they grow. Eligible, therefore, as it is to plant young oaks among hedge-wood, the advantage to be obtained from it reſts wholly on the after-management which is purſued.

In the Annals of Agriculture, Mr. Young ſtates, that oaks are of ſlow growth, but if you put them at proper diſtances amongſt the quick growing trees, they will ſometimes be drawn up beyond your expectations, and he cautions you to watch them, and to cut out ſuch trees as crowd upon them, by tranſplanting them every third year into a nurſery; they may be put out from ſix to ten feet high. And that land that will let at from 12*s.* to 18*s.* *per* acre, for any given time, pays better than with wood, if you calculate the compound intereſt on the annual rent; but who is there that is ſo careful as to make it, or that can make it, on very ſmall ſums? He conſiders the appropriating of 50 acres out of every thouſand, as laying by a ſmall part of the income of an eſtate, that will not be miſſed, at compound intereſt, as an accumulating fund that frequently comes in very ſeaſonable to ſtop a large gap. And he has now, of his grandfather's ſowing, about 26 acres of as fine young oak-timber as can be ſeen, which may be worth, in 25 or 30 years, 4000*l.* He has likewiſe, of his

father's ſowing, 20 acres to ſucceed them. His anceſtors have done ſo much; he has only added about ten acres to the fund, chiefly of Scotch fir, on a poor ſoil where other trees have been tried, and failed; the thinning of theſe woods likewiſe pays a fair rent, after a time. He made a purchaſe upon which were 14 acres of wood-land; there are 400 oak-trees upon it, that in 30 years, from the time of the purchaſe, will ſell for as much as the eſtate coſt him, 1000*l.*

*Thinning of.*—It may be noticed, that one of the moſt eſſential things to be obſerved in the management of oak-woods is the judicious thinning of them. When they are thinned ſo as to be about two feet diſtant, they may ſtand twelve or fourteen years, when every ſecond plant may be taken out and ſold for hoops or ſmall poles; only obſerving, that if the ground be good, and the trees take to growing well, they will want thinning ſooner. In ſeven or eight years more, the healthieſt trees muſt be marked for timber, and the others cut down for poles, and the ſtools left for underwood. In thirty years they will be uſeful for ſmall ſcantlings, ſpars, rafters, battings, rails, props, &c. not quartered. And, that during this time, according to the opinion of ſome, they ſhould never on any account be touched with the knife, axe, or pruning-hook. Some recommend the cutting off ſide ſhoots; others cutting them to the ground to make the better ſhoots. But this is probably the reaſon why, when oaks are cut up in expectation of finding them clean timber, that a variety of rotten knots grown over with ſound wood appear in them, being the places where boughs had been cut off. It is certainly the caſe where they are advanced in growth, but in their infant ſtate it is generally allowed, that they require judicious pruning. Mr. Marſhall contends, that to hack off a large bough from an aged tree, is a crime of the deepeſt dye in the management of timber. But what relation has this mad act to the ſalutary operation of removing a twig from the ſtem of a young growing tree, or of pruning the boughs, or even removing the leader of a tree in a youthful growing ſtate? In that caſe, the ſize of the wound and the exhauſted ſtate of the tree unite to prevent the healing, and a defect in the timber conſequently takes place; whilſt in this, the wound is inconſiderable, and the vigorous ſtate of the tree enables it to cicatrize the ſore, in a few months perhaps after the operation is performed. And by freeing the ſtems of young trees from ſide ſhoots, and keeping their leaders ſingle, a length of ſtem is obtained; which by afterwards checking their upright growth, and throwing the main ſtrength of the head into one principal bough, by checking, not removing the reſt, a crookedneſs of timber is had; and what is equally neceſſary in ſhip-timber, a cleanneſs and evenneſs of contexture. The dangerous, and too often fatal defect cauſed by the decayed ſtumps of dead ſtem boughs being overgrown and hid under a ſhell of ſound timber, a defect which every fortuitous tree is liable to, is by this provident treatment avoided; the timber from the pith to the ſap becoming uniformly ſound, and of equal ſtrength and durability. So that nothing, it is ſuppoſed, but prejudice of the moſt inveterate kind, can reject a practice founded on the moſt obvious principles of nature and reaſon. The miſchief done to hedge-row trees by injudicious lopping too generally obſervable, has ariſen from the practice of taking large boughs from the ſtems of aged trees; not from training young trees during the early ages of their growth, which ſhould always be done. See Wood.

Oak-*Bark*, the cortical ſubſtance ſtripped from the boll and branches of the oak-tree. It is uſed in tanning of leather, and afterwards as a manure, and has lately become a very expenſive article. See Bark and Tan.

Every part almoſt of the oak is aſtringent; but it is only the bark that is officinal; and as the epidermis is perfectly inert, it is taken for medicinal purpoſes from the ſmaller branches, the epidermis of which is thin and ſcarcely cracked. The bark which is cut in ſpring is preferable to that cut in winter, as it contains four times the quantity of the aſtringent principle or tannin. Oak-bark yields its virtues to both alcohol and water. The watery infuſion is affected by all thoſe teſts which indicate the preſence of gallic acid, tannin, and extractive. Sir Humphrey Davy found (ſee Phil. Tranſ. 1803) that ℥j of the inner cortical part of young oak-bark affords by lixiviation grs. iii. of ſolid matter, of which 77 are tannin; the cellular integument, or middle coloured part, yields grs. 43 only of ſolid matter, of which 19 are tannin; and the epidermis furniſhed ſcarcely any quantity either of tannin or extractive. The quantity of tannin varies according to the ſize and age of the trees, and the ſeaſon at which they are barked. Oak-bark is tonic and aſtringent; it has been given united with bitters and aromatics with ſeeming advantage in intermittents; but it is inferior to cinchona, and cannot be depended on. It is uſeful, however, in obſtinate diarrhœa and alvine hæmorrhagies; and it is ſtrongly recommended in the malignant coryza (ſnuffles) of infants, when in ſpite of keeping the bowels regular, and the uſe of cordials, the child becomes weak and pallid. Its principal uſe is as a local aſtringent. The doſe in ſubſtance may be from grs. xv. to grs. xxx; but it is ſeldom given in this form, on account of the difficulty of pulverizing it. The officinal preparation of the "Quercus pedunculata," the bark of which has been above deſcribed, is the "Decoctum quercus" of the London diſpenſatory. This is prepared by boiling an ounce of oak-bark, in two pints of water down to a pint, and ſtraining it. As a local aſtringent, this is uſed in form of a gargle in cynanche and relaxation of the uvula; as an injection in paſſive uterine hæmorrhagies, in leucorrhœa, and the gleety diſcharge which often remains after miſcarriages. It is alſo an uſeful waſh in piles and procidentia recti. Thomſon's Diſpenſatory.

Oak-*leaf Galls*. Theſe are of ſeveral kinds; the remarkable ſpecies called the muſhroom gall is never found on any other vegetable ſubſtance but theſe leaves; and beſide this there are a great number of other kinds.

The double gall of theſe leaves is very ſingular, becauſe the generality of productions of this kind affect only one ſide of a leaf or branch, and grow all one way; whereas this kind of gall extends itſelf both ways, and is ſeen on each ſide of the leaf, in form of two protuberances, oppoſite the one to the other. Theſe are of differently irregular ſhapes, but their natural figure ſeems that of two cones, with broad baſes, and very obtuſe points, though ſometimes they are round, or very nearly ſo.

Theſe make their firſt appearance on the leaf in April, and remain on it till June or longer. They are at firſt green, but afterwards yellowiſh, and are ſofter to the touch than many other of the productions of this kind; they are uſually about the ſize of a large pea, but ſometimes they grow to the bigneſs of a nut. When opened, they are found to be of that kind which are inhabited each by one inſect only, and each contain one cavity. The cavity in this is, however, larger than in any other gall of the ſize, or even in many others of three times the ſize; the ſides of it being very little thicker than the ſubſtance of the leaf.

It is not eaſy to aſcertain the origin of the ſeveral ſpecies of flies, which are, at times, ſeen in this manner to come out of the ſame ſpecies of galls. It ſeems the common courſe of nature, that only one ſpecies of inſect forms one

kind of gall; yet it may be, that two or three kinds may give origin to the ſame kind. There is, however, another occaſion of our ſeeing different ſpecies come out of different galls of the ſame kind; and this is the effect of the enemies of the proper inhabitants.

It might appear that the parent fly, when ſhe had formed a gall for the habitation of her worm offſpring, had placed it in an impregnable fortreſs; but this is not the caſe; for it frequently happens, that a fly, as ſmall perhaps as that which gave origin to the gall, produces a worm which is of the carnivorous kind, as the other feeds on vegetable juices. This little fly, well knowing that where there is one of theſe protuberances on a leaf, there is a tender and defenceleſs inſect within, pierces the ſides of the gall, and depoſits her egg within it. This, when it hatches into a worm, feeds upon the proper inhabitant, and finally, after devouring it, paſſes into the chryſalis ſtate, and thence appears in the form of its parent fly, and is ſeen making its way out of the gall, in the place of the proper inhabitant.

On opening theſe leaf-galls, which are properly the habitation only of one animal, it is common to find two, the ſtronger preying upon the body of the other, and ſucking its juices as it does thoſe of the leaf; often it is found wholly employed in devouring its unoffending neighbour at once: this is probably the caſe when its time of eating is nearly over; and, in fine, when we find the gall inhabited by only one inſect, or containing only one chryſalis, as it ought in its natural ſtate to do, we are never certain that this is the proper inhabitant, as it may be one of theſe deſtroyers who has eaten up the other, and ſupplied its place.

OAK-*leaved Myrtle*, in *Botany*. See MYRICA.

OAK, *Miſletoe of the*. See VISCUM.

OAK, *Poiſon*. See POISON-*Wood*.

OAK *Puceron*, a name given by naturaliſts to a very remarkable ſpecies of animal of the puceron kind. The generality of ſuch animals live on the ſurface of the branches and leaves of trees and plants; but theſe bury themſelves in the clefts of the oak, and ſome other trees, and getting into the crevices, where the bark is a little ſeparated from the wood, they there live at eaſe, and feed to their fill, without being expoſed to their common enemies.

Theſe are the largeſt of all the ſpecies of pucerons; the winged ones are nearly of the ſize of the common houſe-fly, and the naked, or ſuch as have no wings, though leſs than theſe, are yet much larger than any other ſpecies of pucerons; the winged and naked kinds in theſe, as well as in the other ſpecies of pucerons, are all mothers, and great numbers of young ones may be preſſed out of the body of either kind, when gently ſqueezed. The winged ones are black, and the others of a deep brown or coffee colour; they have the moſt remarkable trunk of any animal in the world; it is more than twice the length of their bodies, and has not its origin at the extremity of the head, as in other inſects, but is fixed into the breaſt, near the origin of the firſt pair of legs. When the creature is walking, it carries this ſtraight along the belly, and trailing a conſiderable length behind it, but with the point turned up, that it may be out of the way of accidents, and be ready to ſuck. When the creature has a mind to ſuck a part of the tree that is juſt before it, it draws up, and ſhortens the trunk, till it brings it to a proper length and direction; but when it ſucks in the common way, it crawls upon the inner ſurface of the bark, and the turned up end of the trunk, which reſembles a tail, fixes itſelf againſt the wood that is behind it, or contiguous to its back, and ſucks there. The extremity of this trunk holds ſo faſt by the wood, that when it is pulled away, it frequently brings a ſmall piece of the wood away with it.

The ants are as fond of theſe as of the other ſpecies of pucerons, and that for the ſame reaſon, not feeding upon them, but on their dung, which is a liquid matter of a ſweet taſte, and is the natural juice of the tree, very little altered. Theſe creatures are the ſureſt guides where to find this ſpecies of puceron; for if we at any time ſee a number of theſe crawling up an oak to a certain part, and there creeping into the cleft of the bark, we may be aſſured that in that place there are quantities of theſe oak pucerons. Reaumur's Hiſt. Inſ. vol. vi. p. 64. 76.

The ants are ſo extremely fond of the juices of the tree, when prepared for them by paſſing through the body of this animal, that when the puceron has a drop not yet evacuated, but hanging only in part out at the paſſage, an ant will often ſeize on it there.

OAK, *Sea*. See FUCUS, and WRECK.

OAK-*Snake*, in *Zoology*. See CROTALUS.

OAK-*Webb*, in *Agriculture*, a provincial word applied to the May bug in ſome places.

OAK *Bay*, or the *Devil's Heel*, in *Geography*, lies in the bay of Fundy, 9 leagues S.S.E. of Mooſe iſland.

OAK *Cove*, a cove on the W. coaſt of North America, in the gulf of New Georgia.

OAK *Iſland*, a long narrow iſland on the coaſt of North Carolina, at the mouth of Cape Fear river. N. lat. 33° 52'. W. long. 78° 20'.

OAKFUSKEE. See TALLAPOOSE *River*.

OAKFUSKIES, the name of an Indian tribe in the weſtern part of Georgia.

OAKHAM, a market-town in the ſoke of Oakham, and county of Rutland, England, is ſituated in the centre of a rich valley, called the vale of Catmoſe. This place is divided into two townſhips, or manors, the one denominated the Lord's-hold, and the other, the Dean's-hold. The former belongs to the earl of Winchelſea, who, as ſuperior lord, holds an annual court for the election of the pariſh-officers, at which every inhabitant within its extent is required to appear, and pay one penny, or be amerced at the diſcretion of the clerk; and all free-holders, copy-holders, and waſte-holders, muſt beſides pay their acknowledgments. The latter manor is under the dean of Weſtminſter, by whom a ſimilar court is held every third year.

Oakham is the county-town of Rutlandſhire; the aſſizes and ſhire-courts being always held here. The market-days, according to charter, are Monday and Saturday, but that on Monday is now diſcontinued. In the reign of king John an hoſpital was founded in this town by Walter Dalby, of Exton, for twelve poor men, and two chaplains. It is ſtill ſupported, though comparatively much decayed and impoveriſhed, as well as altered from its original deſign. The free-ſchool, and Chriſt's-hoſpital, both owe their origin to Mr. Johnſon, clergyman of North Luffenham, who built and endowed them by ſubſcription, with the aſſiſtance of ſome lands, which he obtained from queen Elizabeth. The biſhops of London and Peterborough, the deans of Weſtminſter and Peterborough, the archdeacon of Northampton, and the maſters of Trinity and St. John's colleges, Cambridge, are perpetual governors of the hoſpital laſt mentioned. The church here is dedicated to All-Saints, and is a ſpacious ſtructure, conſiſting of a nave, chancel, and ſide-aiſles, with a lofty tower and ſpire, which is ſeen at a conſiderable diſtance. The living is a vicarage, in the patronage of the earl of Winchelſea. Adjoining the church are ruins of an ancient caſtle, ſaid to have been built in early Norman times by Walkelin de Ferrars, ſon of the earl of Derby. It afterwards

afterwards belonged to the lords Tatteſhal, but when king Richard II. advanced Edward, ſon of the duke of York, to the earldom of Rutland, he gave him this caſtle for his baronial reſidence. In the reign of Henry VIII. it was beſtowed upon Thomas Cromwell, when he was elevated to the dignity of baron Cromwell of Oakham; and it is now the property of the earl of Winchelſea. There has long been a cuſtom eſtabliſhed here, that the firſt time a peer of the realm comes within the precinct of the manor, he forfeits a ſhoe from his horſe, to be nailed to the caſtle wall, and ſhould he refuſe to give it, the bailiff of the lordſhip is empowered to take it by force. This due is now generally compounded for with money, and a ſhoe, made larger or ſmaller in proportion to the ſum given in commutation, with the donor's name and titles cut on it, is fixed up in lieu of that from the horſe's foot. Several horſe-ſhoes, gilt and of curious workmanſhip, in conſequence appear on the caſtle hall door, ſome of them of conſiderable antiquity, and others of recent donation. This cuſtom ſeems to have been derived from the circumſtance of the arms of the original owners of the caſtle bearing three horſe-ſhoes.

The hall of this caſtle is now appropriated as a court-room, in which the aſſizes are held, and all the public buſineſs of the town or county is tranſacted. According to the parliamentary returns of 1811, the conjunct population of the two manors or pariſhes, with the ſmall townſhips of Barley-thorpe and Leighfields, in the ſuburbs, was eſtimated at 1709 perſons, and the houſes at 367 in number.

Burleigh houſe, the ſeat of the earl of Winchelſea, is ſituated about two miles to the north-eaſt of Oakham, on an eminence near the village, whence it derives its name. This noble manſion is conſtructed of freeſtone, which was brought from Clipſtone, the moſt northerly point of the county, and is of an oblong form; the ſouth and north fronts being 114 feet in length, and thoſe facing the eaſt and weſt 96 feet, each ſubtending ſide reſembling its oppoſite, both in elevation and deſign. On the ſouth ſide the grand terrace commands a fine proſpect of a rich country; and this appendage is thought to exceed every thing of the kind in the kingdom. Each end of it leads by ſeveral flights of ſteps into an extenſive vale ſkirted by hanging woods. The grand entrance to this manſion, which is placed on the north front, is at once ſingular and grand. A noble court is entered by two handſome lodges, ſituated about 800 feet in a ſtraight line from the hall door, to the left of which is ranged a very extenſive and uniform row of ſtables, and on the right are other ſuitable offices. From this court, a beautiful circular colonnade, ſupported by Doric columns, runs up to the houſe. On the firſt floor of this edifice is a noble painted room, called the ſaloon, which is no leſs admired for magnificence and fine proportion than for its paintings, which repreſent the hiſtory and wars of Julius Cæſar. Theſe were executed by Lanſcroon, pupil of Verrio, who painted many rooms and detached pictures at Burgley, near Stamford. The library here is very extenſive, and contains, beſides a valuable collection of books, ſeveral curious preparations in anatomy and natural hiſtory, together with many valuable family pictures. Wright's Hiſtory and Antiquities of the County of Rutland, &c. Lond. 1684, folio. Camden's Britannia, by Gough, folio.

OAKHAM, a townſhip of America, in Worceſter county, Maſſachuſetts; 15 miles N.W. of Worceſter, incorporated in 1762, and containing 801 inhabitants.

OAKHAM, *Ockham*, or *Oakum*, in the *Sea Language*, denotes the matter of old ropes untwiſted, and pulled out again into looſe hemp, like hurds of flax, to be uſed in the cauking of ſhips.

White oakum is formed of untarred ropes.

OAKHAMPTON, in *Geography*, a borough and market-town in the hundred of Lifton, and county of Devon, England, is ſituated in a valley ſurrounded by hills, 22 miles diſtant from Exeter, and 195 miles from London. At the time of the Domeſday ſurvey, it was held by Baldwin de Brioniis, a Norman, whoſe exertions in the ſervice of the Conqueror were rewarded by the office of hereditary ſheriff of Devonſhire, and a large grant of land which he conſtituted into the barony of Oakhampton, and built a caſtle here for his principal reſidence. This caſtle is mentioned in Domeſday book, which alſo records, that the town had then a market and four burgeſſes. In the reign of Henry II., the barony became veſted in Reginald de Courtenay, by his marriage with Hawiſe, a deſcendant and co-heireſs of Richard, eldeſt ſon of Brioniis, and continued in the poſſeſſion of the Courtenays till the time of Edward IV., when their attachment to the cauſe of Henry VI. rendered them the objects of Edward's rancour: earl Thomas was beheaded at Pontefract, after the battle of Towton-field in the year 1461; his brother John fell in the field of Tewkſbury. Their poſſeſſions were confiſcated to the crown; and Oakhampton caſtle was conſtituted a royal fortreſs, till Henry VII. reſtored it to the Courtenay family, with their other honours and eſtates; but his relentleſs ſucceſſor, having diſcovered a ſecret correſpondence between Henry de Courtenay and cardinal Pole, by one act of tyranny deprived de Courtenay of his head, and by another reduced the magnificent caſtle of Oakhampton to ruins, and devaſtated its noble and extenſive park. The remains of the caſtle became the property of the Mohuns, from whom they deſcended to Chriſtopher Harris, eſq. of Heynes. The ruins of the caſtle are ſituated about one mile ſouth-weſt of the town, on a high maſs of rock; the extenſive area which they include, the ſolidity of their ſtructure, and the advantages of ſituation, prove that this fortreſs, before it was diſmantled, muſt have been ſtrong and important. A lofty keep riſes magnificently from a large conical elevation, which is oppoſed on the other ſide of the ſtream by a ſteep wooded bank. The river Oke meanders through the valley, and runs immediately beneath the ruined walls.

The pariſh church, like the caſtle, is ſituated on an eminence at ſome diſtance from the town. In the market place is an old chantry chapel, the only building within the town worthy notice.

Oakhampton, though a town before the Conqueſt, was not incorporated till the reign of James I., by whoſe charter the civil government is veſted in a mayor, eight aldermen, eight common-councilmen, a recorder, and a town-clerk. Previous to this charter, the chief officer was the portreeve; an office now held by the mayor for the time being, whereby the feudal and corporate powers are united in the ſame perſon. The earlieſt return to parliament for this borough was made in the twenty-eighth year of Edward I.; it was again repreſented in the ſeventh of Edward II. It then ceaſed to ſend members till the year 1640, when the privilege was reſtored; and two members have ſince been regularly choſen. The right of election is in the freeholders and freemen; the number of voters being about 180. The population of the pariſh in the year 1811, as ſtated in the parliamentary ſurvey, was 1440 perſons, occupying 227 houſes. The chief ſupport of the inhabitants is derived from the manufacture of ſerges, and the expenditure of travellers; the turnpike road from Exeter to Launceſton,

Falmouth, &c. paſſing through the town. Four fairs are annually held, and a market weekly on Saturday. Warner's Walk through the Weſtern Counties, 8vo. 1800. Beauties of England, vol. ii. by J. Britton, and E. W. Brayley.

OAKHAMSTON HEAD, a cape of Scotland, on the S.E. coaſt of the county of Caithneſs. N. lat. 58° 15'. W. long. 3° 8'.

OAKINGHAM. See WOKINGHAM.

OAKMULGES, a river of America, which is the ſouthern great branch of the Alatamaha, in the ſtate of Georgia, and, with the confluence of the Oconee, forms this great river.

OALALDA, a town of Africa, in the country of the Foulis; 30 miles E.S.E. of Sibbé.

OAMI, a town of Japan, in the iſland of Niphon; 25 miles S.W. of Moriſa.

OAMY, in *Agriculture*, a provincial term applied to ſuch ploughed lands as are light, porous, and flowery in the nature of their ſoil.

OANDA, in *Geography*, a town of Africa, in the country of the Foulis, on the Senegal; 70 miles S.E. of Goumel.

OANUS, in *Ancient Geography*, a town of Aſia, in Lydia.

OAR, in *Navigation*, a long piece of timber, flat at one end, and round or ſquare at the other, whereby a boat, barge, galley, &c. is rowed, or advanced along the water.

That part of the oar which is out of the veſſel, and which enters into the water, is called the blade, or waſh; and that which is within-board is termed the loom, whoſe extremity, being ſmall enough to be graſped by the rowers, is called the handle.

In a veſſel with oars, the water is to be conſidered as the point of ſupport, or fulcrum; the oar as a lever; the boat as the burden to be moved; and the rower's hand as the moving power. See LEVER, and MECHANIC *Power*.

The burden is to be conſidered as applied to that point of the lever where the oar reſts on the boat; which point, in large veſſels, is called the *row-port*, but in lighters and boats it is always termed the *row-lock*. The greater, therefore, the diſtance of the hand from that point, and the leſs the diſtance of the water from that point, the greater effect will the oars have.

OARS, *To ſhip the*, is to fix them in the row-locks ready for rowing.

OAR, in *Natural Hiſtory*. See ORE.

OARACTA, in *Ancient Geography*, a large iſland of the Perſian gulf, ſituated under the coaſt of Caramania, and inhabited, according to the journal of Nearchus's navigation.

OARII, in *Geography*, a province of Angola, on the N. bank of the Coenda.

OARISTYS, or OARISTYS, a term in the *Greek Poetry*, ſignifying a dialogue between a huſband and his wife; ſuch as that in the ſixth book of the Iliad, between Hector and Andromache.

Scaliger obſerves, that the oariſtus is not properly any particular little poem, or entire piece of poetry; but always a part of a great one. He adds, that the paſſage now cited in Homer, is the only proper oariſtus extant in the ancient poets.

OARUS, in *Ancient Geography*, a river of Scythia, which, according to Herodotus, ſprung from the country of the Thyſſagetæ, traverſed that of the Mæonæ, and diſcharged itſelf into the Palus Mæotis.

OASIS, derived from the Coptic word *Ouahe*, ſignifying a habitable place, a fertile iſland in the midſt of the ſandy deſert of Africa. Of theſe Oaſes, which are called iſlands, becauſe they appear like ſuch in the midſt of an ocean of ſand, there are ſeveral that lie at the diſtance of 100 miles or more from the Nile, to the W. of it. The Arabian geographers were acquainted with theſe detached fertile ſpots, and called them "Elouah," "Ellouah," or "El-wah." Abulfeda ſays, theſe Elouahs are dependent on the Saïd, and that they are iſlands in the middle of ſand. On quitting the Nile, this author ſtates that it takes three days' journey acroſs the deſert to arrive at them. Jacout, who reckons three of them, places them in the weſt of Lower Egypt, beyond the chain of mountains, parallel with the river. Abulfeda adds, that the firſt is well cultivated; that it poſſeſſes abundant rivulets, hot ſprings, fields covered with harveſts, and other ſurpriſing things, but that the people there are wretched. Ptolemy places the largeſt of them, "Oaſis Magna," or "El-wah," under the parallel of 27°; the ſecond in 25° 45', *i. e.* over-againſt Behnéſé; and the moſt northerly in 29° 30', under the parallel of lake Mœris. The ſandy deſert in which theſe Oaſes are ſituated, is occaſionally traverſed by the Muggrebin Arabs, who form a ferocious tribe, and might ſend forth, if they could be united, 30,000 men capable of bearing arms; but as the tribes are divided by inteſtine enmities, their parties ſeldom exceed 4 or 500. The Leſſer Oaſis, "Oaſis Parva," now "El-wah-el-Ghurbi," forms a kind of capital ſettlement of the Muggrebin Arabs, who extend even to Fezzan and Tripoli. They are dreſſed in a linen or cotton ſhirt, over which is wrapped a blanket of fine flannel; all have fire-arms, and are good markſmen, and their muſkets are their conſtant companions. Their chief employment conſiſts in breeding horſes, the males of which they ſell, uſing the mares in their warlike expeditions, camels, and ſheep. They are very hardy and abſtemious; a ſmall cake of bread and leathern bottle of water ſupplying a man with ample proviſion for a day. At El-wah-el-Ghurbi, it is ſaid, that ſeveral ruins are to be found. The "Oaſis Magna," called "El-wah," is at ſome diſtance from the other. Mr. Brown (ſee his Travels in Africa) received information from the Muggrebins at El-wah, that Charjé, the moſt northern village of that diſtrict, was but two days' journey from the neareſt part of "El-wah-el-Ghurbi," that is, about forty miles. Oaſis Magna, he ſays, ſeems rightly to correſpond with the latitude of Dendera, and of courſe that of the ſouthern extremity of Oaſis Parva ſhould be a little to the ſouth of that of Affiût, and not far north of Timo des Mons, in D'Anville's map; apparently the chain on the E. of both the Oaſes. On the W. he obſerved no mountains, nor on the ſouth. The moſt northern Oaſis known near Egypt is that of Siwah, or Seewah. According to Ptolemy, who, in the opinion of Rennell, is more correct than Abulfeda in ſettling the ſituation of El-wah, or the Great Oaſis, its diſtance from Ptolemais on the Nile, in the direction of weſt, ſomewhat ſouthwardly, is 105 miles. This iſland, according to Arrian, is not more than forty ſtadia in extent; Diodorus makes it fifty; that is, ſix or ſeven miles. All accounts agree, that it has one or more fountains of waters, and that it was planted with divers kinds of fruit trees: Arrian particularly notices the palm and olive. What appeared to be a very great natural curioſity was a fountain, which, according to Arrian, varied in its temperature in a very ſingular manner; being very warm or hot at midnight, and very cold in the heat of the day. Rennell ſuppoſes that the fountain, being a deep-ſeated ſpring, would preſerve a mean degree of temperature at all ſeaſons; ſo that, in effect, it was the atmoſphere that underwent the change,

and with it, the bodies of thoſe who made the obſervations. This fountain was called the fountain of the Sun. The ſcite of the ancient temple of Jupiter Ammon, (ſee Ammon,) was four or five days' journey inland from the plain of Gegabib, famous for its dates; and Gegabib is ſeven days' journey from Augela, N. lat. 29° 20', towards Cairo, and theſe diſtances are ſanctioned by the authority of Herodotus, Strabo, Pliny, and Arrian. Herodotus (l. 4.) ſays, that the temple is ſituated ten days from Ægila (Augela); frequented by the Naſamones, on account of the dates, and on the road from Thebes to Ægila. Arrian ſays, on the authority of Ariſtobulus, that Alexander went to it from the ſcite of his new city of Alexandria, along the ſea-coaſts of Egypt and Marmorica, to Parætonium; which latter was ſituated, according to the ſame authority, 1600 ſtadia from Alexandria. Pliny aſſigns to it 200 Roman miles. Theſe accounts are perfectly concluſive; and the poſition of Parætonium is alſo clear in Ptolemy, and is known to the moderns under the name of Al Bareton. Arrian ſays further, that Alexander ſtruck inland from Parætonium, and entered the deſert; but he does not ſay how far the temple lay from the ſea-coaſt. This is ſupplied by Strabo (lib. 17.), who gives the diſtance at 1300 ſtadia. Allowing theſe to produce 130 or 140 miles; and taking Herodotus's ten days from Augela at 170, the meeting of theſe lines of diſtance places the temple in latitude 29° and a ſmall fraction, and in a ſouth-weſterly direction from Parætonium. Pliny ſays, that the temple is 400 (Roman) miles from Cyrene; that is, twice as far as Parætonium is from Alexandria; and this agrees with the former poſition. Ptolemy places it at 195 geographical miles from Parætonium, or by correction 166; and from Cyrene 340. The ſeveral authorities above recited do not vary among themſelves more than thirty miles; and they may, therefore, be conſidered as concluſive. Upon the whole it may be concluded that the ſcite of the temple of Jupiter Ammon ſhould be at leaſt twelve days from El-wah.

The temple was ſurrounded by a triple wall, forming three diſtinct diviſions: one of which was appropriated to the uſe of the monarch. In the time of Herodotus, when probably the temple was in its glory, the dominion of the Ammonites reached within 10 days' journey of the city of Thebes: the people were a colony of Egyptians or Ethiopians, and ſpoke a mixed language. Ammon, or Hammon, was the Egyptian name of Jupiter: and the image of the god, ſimilar to that at Thebes; that is, it had the head of a ram. (See Ammon.) In the time of Strabo, about 450 years after Herodotus, the temple was almoſt deſerted; as the oracle was grown out of faſhion. It is probable, ſays major Rennell, that ſome remains either of the triple wall, or of the temple, may be found at this day; although the materials may have undergone a different kind of arrangement. See-wah appears to be the neareſt town to this Oaſis; and is probably no more than ſix days' journey on the N.E. of it: the ſpring, together with the ruins of the temple and the triple wall, might aſcertain to a curious inquirer the preciſe ſpot.

Under the ſovereigns of the lower empire, the Oaſis became a place of exile: and both Sectaries and Catholics were ſent thither alternately. Neſtorius and Athanaſius were exiled thither. Theſe habitations, become famous on account of the baniſhment of the moſt learned perſonages of the lower empire, were little known by the Perſians. Cambyſes, after ravaging Egypt, wiſhed to carry off the ſpoils of the temple of Jupiter Ammon. The troops he ſent againſt the Ammonians left Thebes and arrived at the city of Oaſis, ſays Herodotus, inhabited by the Samians of the tribe of Eſcrionia. This country, diſtant ſeven days' march from the capital of Egypt, is called by the Greeks, "the Iſle of the Happy." It is reported that the army reached their place of deſtination, but the Ammonians alone knew what become of it, for it has never ſince been heard of. It is ſaid alſo, that being on their march towards the temple of Jupiter, and having got half way, it was ſwallowed by torrents of burning ſand blown up by the ſoutherly wind.

The Oaſis of Ammon is little known by the modern Egyptians. They are better acquainted with the ſecond, where Abulfeda places a city called Behnéſé, different from that on Joſeph's canal. He marks another higher up, correſponding with that of Achmounain, around which are obſerved magnificent remains of antiquity.

The great Oaſis, which is the moſt frequented of the three, being on the road of the caravans of Abyſſinia, contains a great number of inhabitants. The bey of Girgé ſends a cachef there as governor, and to collect a tribute. The geographer of Nubia deſcribes the country of the Ellouah, ſituated to the weſt of Aſſouan, as having been formerly much peopled. At preſent, he ſays, it has no inhabitants. We meet with abundant ſprings there, and fruit trees, with cities buried under ruins.

OASITES Nomos, nomes of which there are two in Egypt, placed by Ptolemy near the lake Mœris.

OAST. See Oost.

OASY. See Oazy.

OAT, Avena, in *Botany*. See Avena.

Oat, in *Agriculture*, the name of a well-known ſpecies of grain, of which there are ſeveral varieties cultivated in different diſtricts of the kingdom. But the moſt common ſorts cultivated in England, are the *white*, the *black*, the *brown*, or *red* oat; the *blue*, the *Poland*, the *Friezland* or *Dutch*, the *Siberian* or *Tartarian* oat, the *Eſſex ſhort ſmall*, the *Churche's* oat, and the *potatoe* oat.

The *white* is met with in the ſouthern parts of the iſland; it makes the whiteſt meal, but is chiefly cultivated where the inhabitants live much upon oat cakes.

The *black* is more generally cultivated in the northern parts of England, and is eſteemed a hearty food for horſes. It bears a wet harveſt well, and anſwers on the wetteſt ſoils more perfectly than the other ſorts.

The *red* oat is much cultivated in Derbyſhire, Staffordſhire, and Cheſhire, but is rarely ſeen in any of the counties near London; though as it is a very hardy ſort, and gives a good increaſe, it would be well worth propagating, eſpecially on ſtrong land: the ſtraw is of a browniſh-red colour, as is alſo the grain, which is very full and heavy, and eſteemed better food for horſes than either of the former ſorts.

The *blue* or *blea* oat is ſaid to have been ſown about Kighley in Yorkſhire. It is probably the ſame with what is cultivated in Lincolnſhire, &c. under the name of *Scotch* greys.

The *Poland* oat has a ſhort plump grain, but the thickneſs of the ſkin ſeems to have brought it into diſrepute among farmers. The grains are moſtly ſingle, it has no awn, and the ſtraw is ſhort. It anſwers beſt on dry warm ſoils and ſituations.

The *Friezland* or *Dutch* oat affords more ſtraw, and is thinner ſkinned than the above kind. The grains are moſtly double, the larger one ſometimes awned, with the awn placed high. It is not ſo much ſown as formerly.

In the *Siberian* or *Tartarian* oat, which is conſidered by Mr. Marſhall as a diſtinct ſpecies, each flower frequently contains three perfect florets, never leſs than two, with a pedicelled

pedicelled rudiment of a third. The panicle differs eſſentially from all the other varieties, the grains are thin and ſmall, the largeſt awned, the ſmall ones awnleſs; the ſtraw is tall and reedy, and of courſe not ſo valuable as fodder.

The *Eſſex ſhort ſmall* is, according to Mr. Young, remarkably ſhort and plump, and weighs better than moſt other kinds. It does well on any land that is tolerably dry.

The *Churche's* oat yields well; it is white, and comes into ear more early than any other oat.

The *potatoe* oat, which is but lately introduced, is very heavy and yields largely, but the ſtem is reedy.

In addition to theſe ſpecies and varieties, there is another ſpecies ſometimes grown, which is the *naked* oat, which Linnæus has obſerved, is very nearly allied to the foregoing, differing in little elſe, except that the grains quit the huſks, and fall naked when they are ripe.

It is ſaid to be ſown in Cornwall in the pooreſt croft-land, that has been tilled two or three ſeaſons before with potatoes, and for the uſes of the poor anſwers all the purpoſes of oatmeal. It is a ſmall yellow grain, and for fattening calves accounted ſuperior to any other nouriſhment.

The oat has an annual fibrous root with the culm of ſtraw two feet high and upwards, having the panicle various in the different varieties, but always looſe with the ſubdiviſions of it on long peduncles and pendulous. And the two glumes or chaffs of the calyx are marked with lines, pointed at the end, longer than the flower, and unequal. There are uſually two flowers and ſeeds in each calyx: they are alternate, conical, the ſmaller one is awnleſs, the larger puts forth a ſtrong, two-coloured bent awn from the middle of the back; both are cartilaginous and fertile.

A late practical writer ſtates that this ſort of grain is hardy, and may be cultivated upon almoſt any kind of ſoil; but, as in others, it is the moſt productive on ſuch as are ſtrong, rich, and adheſive, and which have been newly broken up from the ſtate of graſs. It is ſuggeſted by the author of the report of Middleſex, that though this ſort of grain generally ſells lower than barley, yet, from its being a more certain crop, the ſuperior utility of the ſtraw for the food of cattle, and the increaſe in the quantity of produce, it is equal to barley for medium loams. And that for ſtronger ſorts of lands, and thoſe of the fen kind, it is generally ſuperior to it, though apt to leave the land in a more foul and compact condition. On the cold, tenacious, fenny, and wet deſcriptions of ſoils, the oat may, indeed, in many caſes be ſown with more advantage than any other kinds of crop, and likewiſe where lands cannot be put in a proper condition for barley crops. It is added that oats ſucceed well, after almoſt every ſort of green and root crops, but ſhould not be cultivated after wheat, rye, or barley, where it can poſſibly be avoided, as the ſoil by ſuch cropping would be too greatly exhauſted. It has been obſerved by the author of Modern Agriculture, that, in diſtricts where improved methods of huſbandry are adopted, oats are generally ſown upon ſuch lands as have been newly broken up from the ſtate of graſs, and that the practice is ſhewn to be perfectly correct by the abundance of the produce in ſuch caſes.

The author of the Calendar of Huſbandry, after obſerving that white oats ſhould be ſown in March in preference to any other ſeaſon, remarks, that in the general conduct of them the farmer ſhould by all means avoid the common error of ſowing them after other corn crops, by which they exhauſt the land. They ſhould always receive the ſame preparation as barley, nor ought a good huſbandman to think of their not paying him as well for ſuch attention as that crop. It is a very miſtaken idea to ſuppoſe it more profitable to ſow barley on land in good order than oats. He is from divers experiments inclined to think that oats will equal, and in many caſes exceed barley. The ſuperior quantity of the produce will ever be found to more than anſwer the inferiority of the price; which, however, ſometimes exceeds that of barley. What good reaſons are to be offered for ſowing oats on land in ſuch bad order that barley is not to be ventured in, he knows not. The common argument is their hardineſs, which will give a middle produce, about ſufficient to pay expences and leave a trifling profit, when no other crop will do the like. But this is only proving them to be aſſiſtants to bad huſbandry; nor is ſuch a paltry profit, granting falſe premiſes (for he is well perſuaded that common oat crops, among bad farmers, are but ſo much loſs), an object that ever ought to influence good huſbandmen. Why ſhould a good farmer be at all ſolicitous to gain 10*s.* an acre, profit by oats after barley, &c.? Suppoſe his courſe to be, 1, turnips: 2, barley; 3, oats: or, 1, fallow; 2, wheat; 3, oats: in either of theſe courſes, or in any other, where the oats follow another crop of corn, the profit of them muſt be ſmall. What compariſon with ſowing clover with the barley, which will pay far more profit, and at the ſame time prepare, in the beſt manner, for that moſt beneficial crop, wheat? What but a fallow, or a fallow crop, can ſucceed the oats? How unprofitable, compared to the clover ſyſtem! For theſe reaſons he cannot but recommend that oats ſhould be conſidered in the ſame light as barley, and never ſown unleſs the land be in proper order for barley, or to ſow them after a fallow crop, and clover with them, in the ſame manner as barley. And to the practice of ſowing them after turnips, the ſame obſervations which have been made on barley, are equally applicable. The farmer ſhould, in the diſtribution of his farm, conſider which of theſe two crops is likely to pay him beſt. This will very much depend on the ſoil. Warm forward ſands yield as many quarters of barley, perhaps, as of oats; but upon various other ſoils, the produce of oats, compared with that of barley, will be four to three, and on ſome as five to three. He ſhould alſo take into conſideration, the greater ſteadineſs of price which oats have for many years yielded, in compariſon of the price of barley; circumſtances which may reaſonably induce him to ſow them in a larger proportion than is common among his neighbours. On the other hand, it is not to be forgotten that they exhauſt more in general.

In regard to the method of putting oats on lays, which is very common huſbandry both on one ploughing of old graſs, and on layers of ſhorter duration; the method is to plough the land before the froſts, and to dibble in the ſpring, as ſoon as the weather is dry enough; but the ſoil muſt, from its nature, or from rolling, be in ſuch temper as to permit the holes to ſtand, and not to moulder in, when the dibble is removed. In ſome caſes, the ſafeſt way is, to plough, roll, and dibble immediately. This practice is but little uſed at preſent. But in very many caſes (poſſibly in all) it is better to put peaſe in on light land, beans on ſtiff ſoils, and to follow theſe with oats or wheat, according to circumſtances; he has known oats which had produced inferior crops followed by oats again the next year, and produce largely; which proved that they wanted tilth. Peaſe or beans will rather improve than exhauſt land when put in thus in layers, whereas two crops of oats will ſcourge the land too much. Let it, however, be well remembered, that theſe obſervations are made (ſo far as they relate to old graſs) on the ſuppoſition that the farmer will not or is not allowed to pare and burn, a method vaſtly ſuperior, and which ought to be purſued in all caſes where it is practicable. The cuſtom of cultivating oat crops in ſucceſſion for ſeveral years is, therefore, without doubt,

doubt, equally abſurd and improper, and ſhould be generally exploded and reprobated as highly miſchievous.

*Preparation.*—In the preparation of the land for this ſort of crop, it is recommended in the Middleſex report, that when it is intended to be grown, after cole, tares, early peas, or ſuch other crops as do not come off the ground later than the beginning of June, on ſoils that are too wet to admit of being ploughed in the winter ſeaſon, to make a clean baſtard fallow, laying the land up into ridges proper for being ſown in the early ſpring. Or when, after ſuch clean crops as come off too late to admit of baſtard fallowing, to plough only once, which ſhould be as early as the buſineſs of the farm will admit, into ridges proper for putting the ſeed in. Where the land is inclined to be moiſt, the beſt mode is probably that of ploughing the land on to proper ridges, in the autumn, in order to its being rendered fine and mellow for putting in the crop in the early ſpring, by means of ſcarifying and ſcuffling without any further ploughing, as has been ſhewn in ſpeaking of barley. See BARLEY.

But Mr. Donaldſon ſtates, that whatever may have been the nature of the crop that preceded this, it is but in very few caſes that more than one clean furrow is afforded. In ſome diſtricts it is, he aſſerts, the common practice to plough the lands over that are intended for oats, in the autumn, in a particular manner, ſo as to expoſe as large an extent of ſurface to the influence of the atmoſphere as poſſible. This in ſome places is termed by farmers *rib-furrowing*, and in others *ſlob-furrowing;* it is performed by turning over the furrows at the diſtance of from twelve to eighteen inches from each other on the unbroken land. In this way one-half of the ſuperficial part of the land remains unmoved, and the furrows being thrown on it, much ſurface is expoſed, and the ſoil greatly improved, at the ſame time that the root weeds are deſtroyed. If this proceſs be accompliſhed in the moſt perfect manner, and in the autumnal ſeaſon, the ſoil is conſiderably ameliorated and improved by the froſts during the winter; and by being well broken down by the harrow in the ſpring, having a complete ploughing immediately before the ſeed is put in, the ſoil becomes in an excellent condition for this ſort of crop, even where the land is of the ſtiff and heavy kind. On which the author of Practical Agriculture has remarked, that there can indeed be little doubt but that, by the land's undergoing a more full and complete preparation than is uſual for this crop, the quantity of produce may be greatly increaſed, as the fibrous roots of the plants are more enabled to extend themſelves in the looſe earth, and thereby to afford a more perfect ſupport to the plants. In ſome caſes, as where the land has been much reduced and exhauſted by the previous crops, or in breaking up thin poor ſoils, where the proportion of turfy material is conſiderable, and when the prices of other ſorts of grain are low, it may be advantageous to have recourſe to the uſe of manure, as by ſuch means it is probable that a third more produce at leaſt might be grown.

*Time of ſowing.*—In ſpeaking of the time of ſowing, or putting this ſort of crop into the ground, the ſame writer ſtates, that it is neceſſary to keep in mind that the earlier the ſeed is put into the ground, the ſooner, in general, the crop will be ready to cut. In the more ſouthern parts of the kingdom, it is often the caſe to put this ſort of ſeed into the earth towards the latter end of February, when the ſeaſon is dry and fine; but March is, in general, the oat-ſeed ſeaſon. On ſuch ſoils as are naturally dry and parching, it is however by much the beſt practice to ſow early, in order that the crop may be well eſtabliſhed before the hot weather commences. And beſides, there may be a greater chance of the grain eſcaping the ravages of the worm that often attacks ſuch crops; and when this inſect is preſent, its ravages may be more eaſily prevented. As this ſort of crop is liable to be injured by very ſevere winters, it can ſeldom be ſafe to put it in in the autumn, eſpecially in the northern parts of the iſland; but in the ſouthern diſtricts it may be done with propriety in particular caſes, as where the land is of a very dry and friable nature, large crops having been aſſerted by Mr. Middleton to have been grown in this way in combination with tares in ſome inſtances. But in many caſes this kind of crop may be ſown ſtill more early: Mr. Young adviſes that, in January, if the weather be open, the young farmer ſhould examine ſuch fields as he intends ſowing with oats, that he may conſider if he has any apprehenſion of having his hands full of buſineſs in February and March, whether he ſhould leſſen the work of thoſe more buſy ſeaſons by ſowing ſome oats at this period. The temper of the ſoil muſt govern him: but it is neceſſary that he ſhould know that oats ſown ſo early ſucceed well. And this has been fully ſhewn by the intereſting experiments made by the late Mr. Macro, of Suffolk, and the preſent earl of Winchelſea, and detailed in the Annals of Agriculture. The firſt ſtates, that having tried early and late ſowing of barley, in the year 1784 and in 1785, he had a mind, the following ſeaſon, to try the ſame experiment with white oats; and began by ſowing one acre, in December 1785, with one coomb of ſeed, harrowed in upon a wheat ſtubble, with one earth. Value of land 10*s.* an acre.

And in January 1786, he ſowed exactly another acre by the ſide of it, with the ſame quantity of ſeed, and dreſſed it in the ſame manner. In February another acre the ſame, except half a buſhel leſs ſeed. In the beginning of March he ploughed the remaining part of a piece of land a ſecond time; and, about the middle of that month, ſowed it, at the rate of three buſhels of ſeed an acre, ploughing in one caſt, or half the ſeed, and harrowing in the other half; and marked out another acre for the experiment. This laſt acre had three clean earths.

The produce of the four acres was as below:

| | C. | B. | P. |
|---|---|---|---|
| On that ſown in December - - | 8 | 2 | 0 |
| ——— January - | 8 | 3 | 2 |
| ——— February - - | 6 | 2 | 1 |
| ——— March - - | 6 | 2 | 2 |

On ſeed deducted:

| | C. | B. | P. |
|---|---|---|---|
| On that ſown in December - - | 7 | 2 | 0 |
| ——— January - | 7 | 3 | 2 |
| ——— February - - | 5 | 2 | 3 |
| ——— March - - | 5 | 3 | 2 |

It is added that that ſown in December, though it came up thick enough at firſt, loſt ſo much of its plant, by the winter froſts, that it was expected it muſt have been ploughed up, and ſown again in the ſpring; but obſerving the plants that were alive beginning to flouriſh very early, he gave them time, yet it never got to be a full plant, nor did he expect, though the ſtraw was very ſhort, and the hawes, or ears, very fine ones, that it would have turned out ſo well. Thoſe ſown in January and February both loſt ſome of their plants, ſo that that ſown in March, with the leaſt ſeed, was the fulleſt and eveneſt plant of any.

The latter of the above gentlemen ſtates, that he was induced to make the following trial, from having ſeen upon two very capital farms in Kent and Eſſex, great crops of oats, ſown as early as Chriſtmas week, and from being informed

formed by the gentlemen who occupied thoſe farms, that they always ſowed their oats as early as that, if the ſeaſon admitted of it; and that they thought it the beſt time for ſowing that grain. He wiſhed to aſcertain whether this plan would anſwer in this more northern county. The general time of ſowing oats here is from the beginning of March to the end of April; and it is the opinion of moſt people here, that oats ſown much earlier would be liable to be deſtroyed by ſpring froſts. The laſt winter was very favourable for the experiment, as the weather was open at Chriſtmas for ſowing, and the froſt in the ſpring not ſevere. He divided a field of eight acres equally: one-half was ſown the day after Chriſtmas day; the other half the middle of March. Five buſhels *per* acre were ſown broadcaſt on each part, and the ſame oats: the ſort a ſmall white oat, here called *ſhort ſmalls*. The early ſown were ripe and cut one week before the others; they were harveſted equally well, without being expoſed to any bad weather. He had a rood of each ſet out very carefully in the middle of the field, reaped, and threſhed as ſoon as carried. The produce and weight were as follow:

| | Winch. Buſh. | | Qrs. | P. |
|---|---|---|---|---|
| Early ſown - | 22 | *per* acre - | 11 | 0 |
| Late ſown - - | 19 | ditto - | 9 | 4 |

And the weight *per* Wincheſter buſhel as ſoon as threſhed:

| | |
|---|---|
| Early ſown - | 44½lb. |
| Late ſown - | 42½lb. |

The crop was very good. The land yielded potatoes the preceding year, 450 buſhels *per* acre, and was not manured for that of the oat crop: it had before that been in graſs for ſix or ſeven years. The ſoil a red loam. He is inclined to think that the early ſowing will anſwer here, as this field is very high and much expoſed.

It would ſeem that there can be little doubt from the tolerably hardy nature of this ſort of grain, but that in many inſtances it may be put into the ground at ſuch early periods with great advantage. And in all late ſituations it would probably be more beneficial to put the crops in at much earlier periods than is uſually the caſe in moſt places.

*Quantity of Seed.*—In regard to the quantity or proportion of ſeed that may be required, it muſt obviouſly differ according to the difference of the circumſtances that have been ſtated above; but on ſoils of middling quality, Dr. Dickſon ſuppoſes four buſhels may be ſufficient for the more early ſowings, and five for the later ones, where they are put into the ground in the broadcaſt method, which ſhould conſtantly be the caſe where the firſt modes of preparation are adopted. In ſome of the ſouthern diſtricts, the *Poland* oat is ſown at the rate of about four buſhels the acre for the firſt ſowings; and it has been found in practice that the earlieſt ſown crops conſtantly afforded the moſt perfect ſample, and in general the moſt abundant produce. With the oats, clover may be ſown when neceſſary, the ſeeds being covered by harrowing ſuitably to the condition of the land; and where the ſoil is very light or mellow, a roller ſhould be paſſed over it as ſoon after as poſſible, in order to preſs the mould to the ſeeds: but in other circumſtances it may be more adviſable to defer the rolling until the ſeaſon is dry, and the crop ſomewhat advanced in its growth. The practice of ſowing oats under furrow, though it has been attempted on the lighter and more dry ſorts of land, is not by any means to be adviſed, as in ſuch a method, the ſeed is apt to be depoſited to too great a depth, and to be in danger of either being in ſome meaſure deſtroyed, or of coming up in an irregular manner. It is added, that the uſe of the drill has not been ſo much practiſed with this ſort of crop, as to fully aſcertain the utility of it; nor has that of dibbling been tried with that ſort of attention that is neceſſary to determine the propriety of it. According to Mr. Young, Mr. Walker, near Belvoir Caſtle, Lincolnſhire, ſows eight buſhels of oats *per* acre, and finds the crop much better, and the ſample more equal than with leſs ſeed; the oats are leſs *taily*, no tillers to give different degrees of ripeneſs, and the crop ready to cut four or five days ſooner than with thinner ſowing. Mr. Ducket is of the ſame opinion, and holds no idea cheaper than that of recommending the drill huſbandry as ſaving ſeed; he drills five buſhels of oats *per* acre on his land.

And the ſame practical writer further ſtates, that as this kind of grain is ſuppoſed to be more liable than moſt others to degenerate, by being too long continued on the ſame land; it has been the practice of ſome diſtricts to change it for ſuch as has been imported from other countries. It is probable, however, that by collecting and ſowing the beſt and moſt perfect of our own produce, this expenſive practice may be rendered unneceſſary. By ſimilar attention, moſt of the different ſorts of oats are alſo capable of being greatly improved both in the quality and appearance of the grain or ſample.

It is alſo added, that where this ſort of grain is cultivated on ſuch lays as are nearly broken up, there may frequently be danger, eſpecially where the land has been long in the ſtate of graſs, both from the deſtructive attacks of inſects, and the ſoil becoming too light, open, and porous, from the decay of the graſſy material, for the ſupport of the plants. The firſt may probably in ſome meaſure be obviated, by eating ſuch lands very cloſe with ſheep previous to their being broken up, as by ſuch a method the ova of ſuch inſects may be much deſtroyed, and their propagation prevented. And the treading the crops by ſheep, as well as the roller, may likewiſe be beneficial in both reſpects. According to Mr. Banniſter, horſes have alſo been turned in for the ſame purpoſe. For the above reaſons, it has been ſuggeſted as improper to put oat crops in on newly broken upland, or what in ſome diſtricts is termed a *lea breech*. For to ſow oats on a lay newly broken up, eſpecially if ſuch ground has been many years in graſs, is at all times very hazardous, and frequently cauſes a total deſtruction of the crop, an inſtance of which he experienced in the ſpring of the year 1771. The preceding winter had been very ſevere, with a continuation of unkindly weather till late in the ſpring, for at the cloſe of the month of April, the ponds were covered with ice, and ſharp froſty nights intervened till the 10th of May. Early in the month of March he ſowed with oats a fainfoin lay, that had been ploughed up ſome months before, and covered in the ſeed with the large two-horſe harrow, and as ſoon as poſſible cloſed the ſoil with a five-horſe roll, ſo that the ground ſeemed to lie as cloſe as one could deſire; but the dry froſty weather above mentioned, ſetting in for a month afterwards, rendered the ſurface very porous, and the ſoil was become dry as aſhes, and by far too light for the purpoſes of vegetation. Towards the middle of April, the oats, by favour of ſome kindly ſhowers, began to make their appearance, but before they were all fairly out of the ground, the worm ſeized on the fibrous roots below the ſurface. The land being at that time not ſufficiently dry to admit the uſe of a roll, he endeavoured to cloſe the lightened ſoil by treading it with horſes. His primary views were to have trodden the upper part of the field only, the lower ſide remaining at that time unhurt by the worm; but in a few days theſe inſects ſpread over the whole cloſe, and although he omitted no oppor-

opportunity of treading and rolling throughout the ſpring, the crop at harveſt was very ſlender, as well in ſtraw as grain. From hence we may learn how hazardous it is to ſow ſuch lay ground, in the firſt year after breaking up with oats, or indeed of cropping it with any other grain, than either peaſe or beans; for though in a very kindly year, ſuch corn may not be totally deſtroyed by the worm, as it turned out in the event, with the greateſt part of his oats; yet there is no doubt but (maugre all his care and pains) the huſbandman will then find cauſe to repent of his conduct, and ſhould a dry froſty time ſucceed, the deſtruction of the crop is inevitable. Still more hazardous is it to ſow this grain on what is termed a lay breech, as the worm will in ſuch a ſeaſon be more likly to deſtroy the crop, than even after the firſt breaking up of the lay ground. Peas and beans, according to the nature of the ſoil, are generally conſidered as the moſt proper ſorts of crops in theſe caſes.

*Sowing ſeeds with.*—In general it is conſidered as a better and more correct practice to ſow graſs ſeeds with this crop than barley, as the tillage requiſite for the latter may diſpoſe it to become rank and be lodged, by which the graſs will be drawn up weak through it, and in that way be greatly injured, as well as the barley, by the humidity thus produced, require a long time in the field, and in that way be expoſed to more danger in caſe of a wet ſeaſon ſucceeding, while with oats there is little riſk in theſe reſpects, as the ſtraw is much ſtiffer and more firm. Where oat crops are thin upon the ground, they grow ſtrong, and are conſequently better capable of ſupporting themſelves without falling on the ground or lodging.

*Culture afterwards.*—In regard to the culture that is afterwards neceſſary for this ſort of crop while growing, it is merely that of keeping it as clean and free from weeds as poſſible, by means of hoeing and hand-weeding, throughout the month of May. The crops, that are drilled, ſhould be well cleaned in the rows by the hand as well as the hoe. The author of Practical Agriculture ſtates, that it is alſo a practice in ſome places to paſs a light roller over the crop, after it has advanced a few inches in height, when the ground has been ſlightly moiſtened by rain; by which the cloddineſs of the ſurface is reduced, and the plants in ſome meaſure earthed up, and the progreſs of the crop not only much promoted, but, where thin, the plants rendered more thick upon the land by the tillering that is thus produced. And he adds, that it is ſometimes a practice in this ſort of crop, as well as that of wheat, where there is danger of its being too rank or luxuriant in its growth, to feed it down with ſheep in the ſpring months. This is not however a method that is to be adopted, except in particular circumſtances, as where there is a great difficulty in procuring ſheep feed at ſuch periods, or where the worm is committing its ravages upon the plants; as this ſort of grain is not in general apt to be injured either by the luxuriancy of its growth, or by being lodged on the ground.

*Reaping the Grain.*—It may be ſtated, that oat crops are ready for the ſcythe or ſickle, when the ſtraw exhibits a yellowiſh caſt, the grain becomes hard, and the chaff opens in ſuch a manner, as to render it in ſome degree naked. This ſort of crop does not require to be ſo dry when put into the ſtack, as thoſe of either the wheat or barley kinds. The reaping of this ſort of crop, where cut low, is a good practice, as in other modes, what is left in the field, is loſt to the farm-yard. The ſheaves in wet harveſts ſhould not be made too large, or be bound up when in a damp ſtate. It is ſeldom that this ſort of crop need be kept out in the field any great length of time after it is cut.

*General Application.*—With reſpect to the application of this ſort of crop, in the northern counties, the meal is frequently made into a wholeſome bread, and uſed in other articles of human food; but in the ſouthern diſtricts its principal uſe is for the food of horſes, for which purpoſe it is reckoned very nutritive, being ſweet and of an opening nature: but it muſt not be given them before it has ſweated in the mow, or been otherwiſe dried, leſt it ſhould prove of too laxative a quality.

Oat, in the *Materia Medica.* Some phyſicians have formerly recommended a diet drink made of oats, in various diſtempers. The method of preparing the drink is as follows: take of recent oats, entire and well waſhed, one pound and a half; of the freſh root of ſuccory, cut into ſlices, one handful; ſpring water, twelve pints; boil all together in a clean earthen veſſel to the conſumption of half, and then ſtrain the liquor through a linen cloth, and add to it ſix ounces of coarſe ſugar, and half an ounce of ſal prunellæ; let it boil again, and afterwards be taken off the fire, and ſet by, for a day and a night, in a cool place; then pour off the clear liquor, and keep it in a cellar in veſſels cloſe ſtopped.

Two ordinary cupfuls of this liquor, given twice a-day, three hours before, and as many after dinner, have been ſaid to perform wonders in the cure of all kinds of fevers, colic pains, pleuriſies, itches, cutaneous tumours, and hypochondriacal diſorders; as alſo in cleanſing the kidnies from ſand, and opening the obſtructed viſcera. The uſe of it is ordered to be continued thirteen days, and, if the patient be cachochymic, a gentle purge is to be given before it is taken. It is accounted a great preſervative againſt illneſs, if taken thrice a-year, in ſpring, in autumn, and in the dog days; and the inventor of it, Joannes de St. Catherina, is ſaid to have kept himſelf alive by it to the age of an hundred and twenty years, without any diſeaſes.

Dr. Lower having tried it, and found its good effects, by repeated experience, made it public, and the celebrated Hoffman has written an expreſs treatiſe about it, in which he recommends it both in intermittent and continued fevers, but adviſes purified nitre to be uſed inſtead of the ſal prunellæ, and obſerves that the two boilings, ordered by Dr. Lower, are not neceſſary, but that the ſugar and nitre may be added at firſt. It muſt be kept carefully in ſummer, otherwiſe it ſoon becomes ſour and unfit for uſe.

Thoſe who deſire to have it coloured may boil in it an ounce of alkanet root, and two ounces of red ſanders, which will give it a fine red colour, without at all affecting its virtues.

Oats, when freed from their cuticle, are called *groats*; in which ſtate, as well as when ground into meal, they are uſed both dietetically and medicinally. In both ſtates they yield to water by coction the fecula they contain, and form a nutritious amylaceous gruel, which is beſt made by putting three ounces of groats into four pints of water, and boiling ſlowly until the water be reduced one-half; then ſtraining through a ſieve to ſeparate the undiſſolved part of the groats from the gruel. The nutrient qualities of oats are well known. The meal conſtitutes the chief ſupport of the poor; and for infants, deprived of their natural and proper nouriſhment, the breaſt-milk, no better ſubſtitute can be adopted than thin groat gruel mixed with good cow's milk. The gruel ſhould not be kept longer than 48 hours, as it becomes aceſcent after that period.

Oats have not been chemically examined; but the greater part of their ſubſtance appears to conſiſt of fecula or ſtarch.

For medical purpoſes, gruels, or decoctions of groats or of oatmeal, are excellent demulcents, and they are therefore very frequently preſcribed in inflammatory diſeaſes, diarrhœa, cholera, dyſentery, calculus, and in moſt febrile affections. They may be ſweetened, acidified, or uſed plain. They are alſo uſed locally in glyſters; and the meal boiled with water into porridge forms an excellent ſuppurative poultice. Thomſon's Lond. Diſp.

OAT-*Graſs*, in *Agriculture*, the name of a coarſe ſort of graſs, that may perhaps ſometimes be cultivated to advantage. See AVENA.

OAT-*Snail*. See SNAIL.

OATS, *Wild*, a ſpecies of this ſort of grain, which is a weed, and difficult to be extirpated, where it has once taken poſſeſſion; as ripening before harveſt, and ſcattering its ſeed which remains in the ground till it is ploughed up again, though for a whole year or more, and will then come up with the corn. Some adviſe, as the ſureſt way for deſtroying it, to lay the ground down to clover, and mow the oats and clover together before they are ripe.

OATARA, in *Geography*, one of the ſmall Society iſlands, abounding with wood, S.E. of Ulietea.

OATES, TITUS, in *Biography*, a very ſingular character, who flouriſhed in the ſeventeenth century, was born about the year 1619. He was educated at Merchant-Taylors' ſchool, from whence he removed to Cambridge. When he left the univerſity, he obtained orders in the church of England, though in his youth he had been a member of a Baptiſt church in Virginia-ſtreet, Ratcliffe-Highway, and officiated ſome time as aſſiſtant to his father; he then held a vicarage in Kent, and afterwards in Suſſex. In 1677 he became a convert to the church of Rome, and entered himſelf a member of the ſociety of Jeſuits. He is chiefly known as the informer of the Popiſh plot, of which a full account is given in Hume's Hiſtory of England, vol. viii. ch. lxvii. For this pretended diſcovery he received a penſion of 1200*l. per annum*, was lodged in Whitehall, and protected by the guards; but ſcarcely had king James aſcended the throne, when he took ample revenge of the ſufferings which his information had occaſioned to the monarch's friends: he was thrown into priſon, and tried for perjury with reſpect to what he had aſſerted as to that plot. Being convicted, he was ſentenced to ſtand in the pillory five times a-year during his life, to be whipt from Aldgate to Newgate, and from thence to Tyburn, which ſentence, ſays Neal, was exerciſed with a ſeverity unknown to the Engliſh nation. "The impudence of the man," ſays the hiſtorian Hume, "ſupported itſelf under the conviction; and his courage under the puniſhment. He made ſolemn appeals to heaven, and proteſtations of the veracity of his teſtimony. Though the whipping was ſo cruel, that it was evidently the intention of the court to put him to death by that puniſhment, yet he was enabled by the care of his friends to recover, and he lived to king William's reign, when a penſion of 400*l.* a-year was ſettled upon him. A conſiderable number of perſons adhered to him in his diſtreſſes, and regarded him as a martyr to the Proteſtant cauſe." He was unqueſtionably a very infamous character, and thoſe who regard the pretended Popiſh plot as a mere fiction, ſay that he contrived it out of revenge to the Jeſuits, who had expelled him from their body. After having left the whole body of Diſſenters for thirty years, he applied to be admitted again into the communion of the Baptiſts, having firſt returned to the church of England, and continued a member of it ſixteen years. In 1698, or 1699, he was reſtored to his place among the Baptiſts, from whence he was excluded in a few months as a diſorderly perſon and a hypocrite: he died in the year 1705. He is deſcribed by Granger as a man "of cunning, mere effrontery, and the moſt conſummate falſehood." And Hume deſcribes him as "the moſt infamous of mankind; that in early life he had been chaplain to colonel Pride; was afterwards chaplain on board the fleet, whence he had been ignominiouſly diſmiſſed on complaint of ſome unnatural practices: that he then became a convert to the Catholics; but that he afterwards boaſted, that his converſion was a mere pretence, in order to get into their ſecrets and to betray them." Hume Hiſt. Toulmin's Edition of Neal, vol. iv. and v.

OATH, JUSJURANDUM, is uſually defined a religious aſſertion or aſſeveration; wherein a perſon invokes the Almighty, renounces all claim to his mercy, or even calls for the divine vengeance upon himſelf, if he ſpeak falſely.

Some civilians look on this definition as too lax, ſince it may agree to perjury; and would have this eſſential to an oath, that the thing affirmed be true. But this is arbitrary.

An oath is eſteemed a kind of civil medium, between the perſon that gives it, and him to whom it is given; by which ſome controverſy or other matter, which could not otherwiſe be determined, is brought to an iſſue. Its form, and the ceremonies with which it is attended, are arbitrary, and various in different countries.

The oaths we make to God are called *vows*, and in ſome caſes *ſacraments*.

OATH, in a legal ſenſe, is a ſolemn action, whereby God is called to witneſs the truth of an affirmation given before one or more perſons empowered to receive the ſame.

The forms of oaths, like other religious ceremonies, have been always various, but conſiſting, for the moſt part, of ſome bodily action, and of a preſcribed form of words. Amongſt the Jews, the juror held up his right hand towards heaven, which explains a paſſage in the 144th Pſalm, "Whoſe mouth ſpeaketh vanity, and *their right hand is a right hand of falſhood*." The ſame form is retained in Scotland ſtill, amongſt the ſame Jews. An oath of fidelity was taken, by the ſervant's putting his hand under the thigh of his lord (ſee Gen. xxiv. 2.); and hence, with no great variation, is perhaps derived the form of doing homage at this day, by putting the hands between the knees, and within the hands of the liege. Amongſt the Greeks and Romans, the form varied with the ſubject and occaſion of the oath. In private contracts, the parties took hold of each other's hand, whilſt they ſwore to the performance; or they touched the altar of the god, by whoſe divinity they ſwore. Upon more ſolemn occaſions it was the cuſtom to ſlay a victim; and the beaſt being *ſtruck down*, with certain ceremonies and invocations, gave birth to the expreſſions, τεμνειν ορκον, *ferire pactum*, and to our Engliſh phraſe, tranſlated from theſe, of "ſtriking a bargain." The forms of oaths in Chriſtian countries are alſo very different; but in no country in the world, as archdeacon Paley believes, worſe contrived, either to convey the meaning, or impreſs the obligation of an oath, than in our own. Legal oaths end with, "So help me God;" anciently with, "So help me God, at his holy *dome*, *i. e.* judgment." More frequently, the ſubſtance of the oath is repeated to the juror, by the perſon who adminiſters it, adding in the concluſion, "So help you God." The energy of the ſentence reſides in the particle *ſo; ſo*, that is, *hâc lege*, upon condition of my ſpeaking the truth, or performing the promiſe, and not otherwiſe, "May God help me." The juror, whilſt he hears or repeats the words of the oath, holds his right hand upon a bible, or other book, containing the four goſpels. He then kiſſes the book;

book; the kiſs being rather an act of reverence to the contents of the book, as, in the Papiſts' ritual, the prieſt kiſſes the goſpel before he reads it, than any part of the oath.

This, according to our law-books, is called a *corporal oath*; becauſe, as it has been commonly ſaid, the party, when he ſwears, touches the goſpels with his right hand. This opinion, however, ſays archdeacon Paley, appears to be a miſtake: for the term is borrowed from the ancient uſage of touching, upon theſe occaſions, the *corporale*, or cloth which covered the conſecrated elements.

But in ſome old cuſtoms of Anjou and Maine, it appears that *corporal* oath was anciently a ſimple affirmation, or vow of faith and fidelity, made by a vaſſal who has no liege, by lifting up his hand; in contradiſtinction to that made by a liege vaſſal, which was made by laying his hand on the goſpel.

An oath is called *canonica purgatio*, becauſe allowed of by the canons; to diſtinguiſh it from *vulgares purgationes, viz.* by battle, fire ordeal, &c. which the church always diſcouraged. In ſmall matters, which the plaintiff could not prove, or, if he could, if his proof were ſet aſide, the defendant might purge himſelf by his own oath: this was called *jurare propria manu.*

But in matters of more weight, he was to bring other credible perſons, uſually of the ſame quality with the plaintiff, to ſwear that they believed the defendant had ſworn the truth.

Theſe were called *compurgators*, or *ſacramentales;* and their number was greater or leſs, according to the quality of the defendant, and the nature of the thing in queſtion. Hence, *jurare duodecima manu.* See COMPURGATORS.

The obſcure and elliptical form of an oath, above-mentioned, together with the levity and frequency with which it is adminiſtered in our country, has occaſioned a general inadvertency to the obligation of oaths, that is much to be lamented, both in a religious and political view; and it merits public conſideration, ſays Paley, whether the requiring of oaths on ſo many frivolous occaſions, eſpecially in the cuſtoms, and in the qualifications for petty offices, has any other effect than to make them cheap in the minds of the people. This ingenious writer ſuggeſts, that the law may continue its own ſanctions, without adding the ſolemnity of an oath: and where it is neceſſary, let it annex to prevarication penalties proportioned to the public conſequence of the offence. Whatever be the form of an oath, the ſignification is the ſame. It is the calling upon God to witneſs, *i. e.* to take notice of what we ſay, and invoking his vengeance, or renouncing his favour, if what we ſay be falſe, or what we promiſe be not performed. The Quakers and Moravians refuſe to ſwear upon any occaſion; founding their ſcruples concerning the lawfulneſs of oaths upon our Saviour's prohibition, Matt. v. 34, "I ſay unto you, Swear not at all." In order to reconcile with this paſſage of ſcripture the practice of taking oaths, when required by law, the writer now cited ſuggeſts the following obſervations. It does not appear, that ſwearing "by heaven," "by the earth," "by Jeruſalem," or "by their own head," was a form of ſwearing ever made uſe of amongſt the Jews in judicial oaths; and, therefore, it is not probable, that our Saviour refers in the caſes to which we have above alluded, to judicial oaths. As to the ſeeming univerſality of the prohibition, "Swear not at all," the emphatic clauſe "not at all" is to be read in connection with what follows, neither "by the heaven," nor "by the earth," &c. So that "not at all" does not mean upon no occaſion, but by none of theſe forms. When our Saviour himſelf was "adjured by the living God" to declare whether he was the Chriſt, the Son of God, or not, he condeſcended to anſwer the high-prieſt, without making any objection to the oath (for ſuch it was) upon which he examined him. Beſides, St. Paul, when he ſays to the Romans "God is my witneſs," and to the Corinthians, "I call God for a record upon my ſoul," uſes expreſſions which contain the nature of oaths: and the epiſtle to the Hebrews ſpeaks of the cuſtom of ſwearing judicially, without cenſure or diſapprobation: "Men verily ſwear by the greater, and an oath, for confirmation, is to them an end of all ſtrife." Upon theſe grounds our Saviour's words are underſtood as relating, not to judicial oaths, but to the practice of vain, wanton, and unauthorized ſwearing, in common diſcourſe. Our author further obſerves, that oaths are nugatory, or carry with them no force or obligation, unleſs we believe that God will puniſh falſe ſwearing with more ſeverity than a ſimple lie or breach of promiſe. See PERJURY.

As oaths are deſigned for the ſecurity of the impoſer, it is manifeſt they muſt be *interpreted*, and performed in the ſenſe in which the impoſer intends them; otherwiſe they afford no ſecurity to him: and this is the meaning and reaſon of the rule "jurare in animum imponentis." This rule our author applies to the explication of certain particular oaths, the nature and obligation of which he inveſtigates.

In explaining the oath of allegiance, (ſee ALLEGIANCE,) he conſiders what it excludes and what it permits. It excludes all intention to ſupport the claim or pretenſions of any other perſon or perſons, to the crown and government, than the reigning ſovereign; and all deſign at the time, of depoſing the reigning prince, for any reaſon whatever. It forbids the taking up of arms againſt ſuch prince, with views of private advancement, or from motives of perſonal reſentment or diſlike. On the other hand, this oath permits reſiſtance to the king, when his ill behaviour or imbecility is ſuch as to make reſiſtance beneficial to the community; and it does not require obedience to ſuch commands of the king, as are unauthorized by law, nor that we ſhould continue our allegiance to the king, after he is depoſed, driven into exile, carried away captive, or otherwiſe rendered incapable of exerciſing the regal office, whether by his fault or without it. As to the oath againſt bribery in the election of members of parliament, our author obſerves, that the ſeveral contrivances to evade this oath, ſuch as the elector's accepting money under colour of borrowing, and giving a promiſſory note or other ſecurity for it, which is annulled after the election; receiving money from a ſtranger, or a perſon in diſguiſe, or out of a drawer, or purſe, left open for the purpoſe, or promiſes of money to be paid after the election; or ſtipulating for a place, living, or other private advantage of any kind; if they eſcape the legal penalties of perjury, they incur the moral guilt; for they are manifeſtly within the miſchief and deſign of the ſtatute which impoſes the oath, and indeed within the terms of the oath itſelf. For the oath againſt ſimony, ſee SIMONY. Many oaths are impoſed on members of colleges in the univerſities, and on other ancient foundations, requiring the obſervance of their reſpective ſtatutes, which obſervance is become, in ſome caſes, unlawful, in others impracticable, in others uſeleſs, in others inconvenient. The "animus imponentis," ſays our author, which is the meaſure of the juror's duty, ſeems to be ſatisfied, when nothing is omitted, but what, from ſome change in the circumſtances under which it was preſcribed, it may fairly be preſumed that the

founder himſelf would have diſpenſed with. In connection with the ſubject of oaths, the obligation of ſubſcription to articles of religion is conſidered; for which we refer to the article SUBSCRIPTION. Paley's Principles of Moral and Political Philoſophy, vol. i.

OATH is alſo uſed for a ſolemn promiſe faithfully to execute or obſerve ſomething. See JURY and TRIAL.

In this ſenſe we ſay, *ſtate oaths*, the *oaths of* SUPREMACY, *oath of* ALLEGIANCE, *oath of* ABJURATION; which ſee reſpectively. All that bear offices in the government, peers, and members of the houſe of commons, eccleſiaſtical perſons, members of colleges, ſchoolmaſters, preachers, ſerjeants at law, counſellors, attornies, ſolicitors, advocates, proctors, &c. are enjoined to take the oaths of allegiance, ſupremacy, and abjuration: and perſons neglecting or refuſing are declared incapable to execute their offices and employments, diſabled to ſue in law or equity, to be guardians, executors, &c. or to receive any legacy, or deed of gift, to be in any office, &c. and to forfeit 500*l.* (See CONTEMPT and PRÆMUNIRE.) We have frequently acts paſſed for indemnifying perſons, who have omitted to qualify themſelves for offices and promotions, within the time limited by law, and for allowing farther time for that purpoſe.

Kings and princes ſwear to the performance of the treaties they make; though, anciently, they did not ſwear of themſelves, but others ſwore in their name.

OATH, *Coronation*, is, by 1 W. & M. ſtat. 1. cap. 6. to be adminiſtered to every king and queen, who ſhall ſucceed to the imperial crown of theſe realms, by one of the archbiſhops or biſhops of the realm, in the preſence of all the people: it is conceived in the following terms: the archbiſhop or biſhop ſhall ſay, Will you ſolemnly promiſe and ſwear to govern the people of this kingdom of England, and the dominions thereto belonging, according to the ſtatutes in parliament agreed on and the laws and cuſtoms of the ſame? The king or queen ſhall ſay, I ſolemnly promiſe ſo to do. Archbiſhop or biſhop. Will you, to your power, cauſe law and juſtice, in mercy, to be executed in all your judgments? King or queen. I will. Archbiſhop or biſhop. Will you, to the utmoſt of your power, maintain the laws of God, the true profeſſion of the goſpel, and the Proteſtant reformed religion, eſtabliſhed by the law? And will you preſerve unto the biſhops and clergy of this realm, and to the churches committed to their charge, all ſuch rights and privileges, as by law do or ſhall appertain to them or any of them? King or queen. All this I promiſe to do. After this the king or queen, laying his or her hand upon the holy goſpels, ſhall ſay, The things which I have here before promiſed, I will perform and keep. So help me God. And then ſhall kiſs the book. Blackſt. Com. book i.

OATH, *ex Officio*, an oath ſo called, which was formerly much uſe of in the ſpiritual courts, as well as in criminal caſes of eccleſiaſtical cognizance, as in matters of civil right; of which the high commiſſion court (ſee COURT), in particular, made a moſt extravagant and illegal uſe: forming a court of inquiſition, in which all perſons were obliged to anſwer in caſes of bare ſuſpicion, if the commiſſioners thought proper to proceed againſt them "ex officio" for any ſuppoſed eccleſiaſtical enormities. But when the high commiſſion court was aboliſhed by ſtatute 16 Car. II. c. 11. this oath "ex officio" was aboliſhed with it; and it is alſo enacted by ſtatute 13 Car. II. ſt. 1. c. 12. "that it ſhall not be lawful for any biſhop or eccleſiaſtical judge to tender to any perſon the oath "ex officio," or any other oath which the party may be charged or compelled to confeſs, accuſe, or purge himſelf of any *criminal* matter." (See EX OFFICIO.) But this doth not extend to oaths in a civil ſuit, and therefore it is ſtill the practice, both in the ſpiritual courts, and in equity, to demand the perſonal anſwer of the party himſelf upon oath.

OATH, *Falſe*. See PERJURY.

OATH, *Teſt*. See TEST.

OATMEAL. (See OAT.) The ſelling of corrupt oatmeal is puniſhable by ſtatute, which ſhall be forfeited for the ſecond offence, &c. See 51 Ed. I.

OAXACA. See GUAXACA.

OAXIS, in *Ancient Geography*, a river of Aſia, in Meſopotamia.—Alſo, a river of Scythia.

OAXOS, or OAXUS, a town on the northern ſide of the iſle of Crete. It was the capital of a kingdom, which had its appropriate ſovereign, ſaid to have been founded by Oaxus, the ſon of Apollo.

OAYCACHI, in *Geography*, a town of South America, in the audience of Quito; 25 miles E.N.E. of Quito.

OAZY, or OASY *Ground*, a name given by the ſeamen to ſoft, ſlimy, or muddy ground.

OB, in *Geography*. See OBY.

OBA, a town of Perſia, in the province of Adirbeitzan, on the weſt coaſt of the Caſpian ſea; 150 miles N.E. of Tauris.

OBACH, a town of the duchy of Wurzburg; 3 miles N.W. of Schweinfurt.

OBADIAH, or the *Prophecy of* OBADIAH, a canonical book of the Old Teſtament, which is contained in a ſingle chapter, and is partly an invective againſt the cruelty of the Edomites, who mocked and derided the children of Iſrael, as they paſſed into captivity; and, with other enemies, their confederates, invaded and oppreſſed thoſe ſtrangers, and divided the ſpoil among themſelves: and partly a prediction of the deliverance of Iſrael, and of the victory and triumph of the whole church over her enemies.

The time of this prophet is wholly uncertain. St. Jerom, with the Hebrews, believes, that he was the ſame with the governor of Ahab's houſe, mentioned 1 Kings, xviii. 3. who hid and fed the 100 prophets, whom Jezebel would have deſtroyed. Some ſay, he was that Obadiah, whom Joſiah made overſeer of the works of the temple, mentioned 2 Chron. xxxiv. 12. But moſt authors make him contemporary with Hoſea, Amos, and Joel. Laſtly, ſome believe him to be contemporary with Jeremiah, after the taking of Jeruſalem. It is more probable, ſays Du Pin, that he lived in the time of Ahaz, when the Edomites, in conjunction with the Iſraelites, made war againſt the tribe of Judah, becauſe his prophecy is wholly againſt the Edomites, or Idumæans. The greater part of his book is included in one of the prophecies of Jeremiah. Compare Ob. 1—9. with Jer. xlix. 14, 15, 16. 7. 9. 10.

OBAI, or ROBAI, in *Botany*, the Japaneſe name of a charming ſhrub, called by ſyſtematic botaniſts *Calycanthus præcox*, and figured in Ait. Hort. Kew. ed. 1. v. 2. 220. t. 10, as well as in Kæmpf. Am. Exot. t. 879. (See CALYCANTHUS.) Juſſieu juſtly doubts the propriety of its reference to that genus; but he is miſled by Kæmpfer's plate to ſuppoſe the ſtyle ſimple, though he rightly learned from thence that the ſtamens are but five. The fruit however ſeems to be that of a true *Calycanthus*. This ſhrub, long treated as a ſtove plant, proves hardy in our gardens, flowering in January, before the leaves appear. The flowers have a yellow calyx, and dark purple petals, and ſmell like a Jonquil. The plant is ſtill very little known in England, and we have found a great obſtacle to its preſervation,

tion, in the ſnails and ſlugs, which deſtroy its leaf-buds, as ſoon as they appear.

OBAMA, in *Geography*, a town of Japan, in the iſland of Ximo; 25 miles E. of Nangaſaki.

OBAMENE, a harbour on the eaſt coaſt of the iſland of Otaha.

OBAN, a ſea-port in the pariſh of Kilmore, and county of Argyle, Scotland, is ſituated on the ſhore of a fine bay, in the ſound of Mull, and ſecured from the weſtern ocean by the ſmall iſland of Kerrara. This bay is of a ſemicircular form, and has two openings; one on the north, and another on the ſouth. It is ſufficiently extenſive to afford anchorage for 500 ſail of veſſels, and is well defended from the weſtern winds. To theſe favourable circumſtances the town owes both its exiſtence, and its rapid riſe from a ſmall beginning. The firſt houſe of any conſequence was built about 50 years ago, by a trading company belonging to Renfrew, who uſed it for a ſtore-room. The example being followed by other mercantile adventurers, Oban ſoon became a conſiderable place; and about ten years ſubſequent to its foundation, was made one of the ports belonging to the cuſtom-houſe. The duke of Argyle, Mr. Campbell of Dunſtaffnage, and other perſons who poſſeſſed property around the new eſtabliſhment, rightly judging that its proſperity would much enhance the value of their eſtates, gave every encouragement in their power to promote its increaſe, eſpecially by granting building-leaſes upon the moſt liberal terms. It was particularly indebted to two brothers of the name of Stevenſon, who ſettled in it in 1778; and by their induſtry and ſpirited exertions, not only accumulated handſome fortunes for themſelves, but highly promoted the good of the neighbouring country. Oban is admirably adapted for trade, and is peculiarly well ſituated for a fiſhing ſtation. Theſe, however, are but inferior conſiderations to the great national benefits, which might be derived from its excellent harbour and road-ſtead. It ſeems formed by nature, and a combination of many important advantages, to become the principal place of trade for the Highlands of Scotland, and the middle diſtrict of the weſtern iſles. Knox recommends this place to be made a royal dock and arſenal. There is a regular ferry from Oban to Kerrara iſland, and thence to Achnacraig, in the iſland of Mull; and by the formation of the canal between Loch-Gilp and Loch-Crinan, the navigation from this town to the Clyde has been rendered both direct, and free from the danger of the more circuitous paſſage round the Mull of Cantire.

In the immediate vicinity of Oban are immenſe rocks of breccia, or pudding-ſtone, compoſed of different ſorts and ſizes of rounded pebbles. Some of the pebbles are quartzoſe, others porphyritic, granitic, ſchiſtous, and calcareous; and the whole are cemented together very firmly by a black lava. Other ſpecimens of volcanic minerals are abundant in this neighbourhood. A few rocks of this ſort are excavated to a vaſt depth, particularly one about half a mile ſouth from the town. This indeed ſeems to indicate recent volcanic irruptions. According to the parliamentary returns of 1811, the pariſh of Kilmore, which is of ſmall extent, contains 175 houſes, and 821 inhabitants, who are chiefly reſident in Oban. Beauties of Scotland, vol. v. Pennant's Tour in Scotland, 3 vols. 4to. Lond. 1790.

OBANA, in *Ancient Geography*, a town of Aſia, in Aſſyria. Ptol.

OBARENI, a people who inhabit a conſiderable part of Armenia, near the river Cyrus.

OBBA, a town of Africa, in Mauritania Cæſarienſis.

OBBEDIN, in *Geography*, a town of Walachia; 4 miles N.W. of Krajova.

OBDORSKOI, a town of Ruſſia, in the government of Tobolſk, on the Oby, near its mouth, whither the Samoiedes bring their tribute; 508 miles N. of Tobolſk. N. lat. 66° 10'. E. long. 67° 14'.

OBEAH, a ſuperſtitious practice, or a kind of ſorcery or witchcraft, as the term imports, prevalent among the Negroes in Jamaica, and which has ſo powerful an effect as to bias, in a conſiderable degree, their general conduct, diſpoſitions, and manners. Mr. B. Edwards has given a particular account of this practice, deduced from the reſearches and detail of Mr. Long. The term *obea*, *obiah*, or *obia*, is ſuppoſed to be the adjective, derived from the noun ſubſtantive *obe*, or *obi*; and the words *obea*-man or woman denote thoſe who practiſe *obi*. The etymology of this term is traced, by means of Mr. Bryant's Mythology, to *ob*, or *oub*, which, in the Egyptian language, ſignified a ſerpent. Moſes, by divine authority, forbids the Iſraelites ever to inquire of the demon *Ob*, tranſlated in our Bible charmer or wizard, divinator aut ſorcilegus: and the woman at Endor is called *Oub* or *Ob*, tranſlated Puthoniſſa; and *Oubaios* was the name of the baſiliſk or royal ſerpent, emblem of the ſun, and an ancient oracular deity of Africa. The term, ſuppoſed to be thus derived, is now generally uſed in Jamaica to denote thoſe Africans who in that iſland practiſe witchcraft or ſorcery, comprehending alſo the claſs of perſons, called "Myal-men," or thoſe who, by means of a narcotic potion, made with the juice of an herb, ſaid to be a ſpecies of ſolanum, which occaſions a trance or profound ſleep of a certain duration, endeavour to convince the deluded ſpectators of their power to reanimate dead bodies. According to the reſult of the inquiries of the author now cited, the profeſſors of Obi are, and always were, natives of Africa, and none other; and they have brought the ſcience with them from thence to Jamaica, where it is ſo univerſally practiſed, that there are few of the large eſtates poſſeſſing native Africans, which have not one or more of them. The oldeſt and moſt crafty are thoſe who uſually attract the greateſt devotion and confidence: beſides the advantage derived from their hoary heads, and harſh forbidding aſpect, they poſſeſs ſome ſkill in plants of the medicinal and poiſonous ſpecies, which has qualified them for ſucceeding in their impoſition on the weak and credulous. The Negroes in general, whether Africans or Creoles, revere, conſult, and fear them. To theſe oracles they reſort, with the moſt implicit faith, on all occaſions, for the cure of diſorders, the obtaining of revenge for injuries or inſults, the conciliating of favour, the diſcovery and puniſhment of the thief or the adulterer, and the prediction of future events. The trade which theſe impoſtors carry on is extremely lucrative: they manufacture and ſell their obies, adapted to different caſes, and at different prices. A veil of myſtery is ſtudiouſly thrown over their incantations, to which they allot the midnight hours. The deluded Negroes, who are unſuſpecting believers in their ſupernatural power, become voluntary accomplices in this concealment; and the ſtouteſt of them tremble at the ſight of the ragged bundle, the bottle, or the egg-ſhells, which are ſtuck in the thatch, or hung over the door of a hut, or upon the branch of a plantain-tree, to deter marauders. In caſes of poiſon, the effects of it are by the ignorant Negroes aſcribed wholly to the potent workings of Obi. When a negro is robbed of a fowl or a hog, he applies immediately to the obeah-man or woman: it is then made known among his fellow Blacks, that "Obi is ſet" for the thief; and as ſoon as the latter hears the dreadful news, his terrified imagination induces him to ſeek the only reſource that is left in the ſuperior ſkill of ſome more eminent obeah-man of the neighbourhood, who may

counteract the magical operations of the other; but if no such person can be found, he falls into a decline under the incessant horror of impending calamities. The slightest painful sensation in the head, the bowels, or any other part, as well as any casual loss or hurt, confirms his apprehensions, and he believes himself to be the devoted victim of an invisible and irresistible agency. Sleep, appetite, and cheerfulness forsake him; his strength decays; his features assume the settled gloom of despondency; the most nauseous and unwholesome substance becomes his only food: he contracts a morbid habit of body, and gradually sinks into the grave. A Negro, who is taken ill, inquires of the obeah-man the cause of his sickness, whether it will prove mortal or not, and how long it will be before he either dies or recovers. The oracle generally ascribes the distemper to the malice of some particular person, and advises to set Obi for him; but if no hopes be given of recovery, immediate despair takes place, which no medicine can remove, and death is the certain consequence. As numerous occasions arise which provoke the Negroes to exercise the powers of Obi against each other, a considerable portion of the annual mortality amongst those of Jamaica is ascribed to this fascinating mischief. The Obi is usually composed of a farrago of materials, most of which are enumerated in the Jamaica law, passed in 1760, with a view to its suppression, *viz.* blood, feathers, parrots' beaks, dogs' teeth, alligators' teeth, broken bottles, grave-dirt, rum, and egg-shells. For a further account of this superstitious practice, see Edwards's Hist. of the West Indies, vol. ii.

OBED's River, in *Geography*, a river of America, in Tennessee, which runs south-west into Cumberland river, 290 miles from its mouth by the course of the stream. Cumberland river is thus far navigable for large vessels.

OBEDACH, or Obdach. a town of the duchy of Stiria; 9 miles S.W. of Judenburg.

OBEDIENCE, Obedientia, is sometimes used, in the *Canon Law*, for an office, or the administration of it.

In our *Ancient Customs*, *obedientia* was used in the general for every thing that was enjoined the monks, by the abbot.

Obedience *to Parents*. See Parent.

OBEDIENTIA, in a more restrained sense, was applied to the farm belonging to the abbey, to which the monks were sent *vi ejusdem obedientiæ*, either to look after the farm, or collect the rents. Hence, also, those rents themselves were called *obedientiæ*.

OBEIDIA, in *Geography*, a town of Asiatic Turkey, in the province of Diarbekir, on the Khabur; 80 miles E. of Racca.

OBELIAS, among the ancients, a kind of small cakes, which were toasted on little spits, and served at table as a desert, to be eaten dipped in sweet wine, called *passum*.

OBELISCOTHECA, in *Botany*, so called by Vaillant, on account of the quadrangular, and somewhat pyramidal, cases for the seeds, formed by the scales of the receptacle. See Rudbeckia.

OBELISCUS Marmoreus, in *Natural History*, the name of a very remarkable species of a shell-fish, unknown to us in its recent state, but met with very frequently fossile in the Swedish stone used for pavements, and some other kinds, and more accurately named by late authors *polythalamium*, and *orthoceratites*, and by Klein *tubulus marinus concameratus*.

OBELISK, Obeliscus, a quadrangular pyramid, very slender, and high; raised as an ornament, in some public place, or to shew some stone of enormous size; and frequently charged with inscriptions, and hieroglyphics.

Borel derives the word from the Greek ὀβελος, *a spit, broach, spindle*, or even a kind of *long javelin*. Pliny says, the Egyptians cut their obelisks in form of sun-beams; and that in the Phœnician language, the word obelisk signifies *ray*.

The Egyptian priests called their obelisks the *sun's fingers*; because they served as styles, or gnomons, to mark the hours on the ground. The Arabs call them *Pharaoh's needles*: whence the Italians call them *aguglia*; and the English *Cleopatra's needles*. See Cleopatra's *Needles* and Alexandria.

The difference between obelisks and pyramids, according to some, consists in this, that the latter have large bases, and the former very small ones, compared with their height. Though Cardan makes the difference to consist in this, that obelisks are to be all of a piece, or consist of a single stone; and pyramids of several.

The proportions of the height and thickness are nearly the same in all obelisks; that is, their height is nine, or nine and a half, sometimes ten times their thickness; and their thickness, or diameter, at top, is never less than half, nor greater than three-fourths, of that at bottom.

This kind of monument appears to have been very ancient; and, we are told, was first made use of to transmit to posterity the principal precepts of philosophy, which were engraven on them in hieroglyphic characters. In after-times they were used to immortalize the actions of heroes, and the memory of persons beloved.

The first obelisk we know of was that raised by Rameses, king of Egypt, in the time of the Trojan war. It was 40 cubits high, and, according to Herodotus, employed 20,000 men in the building. Phius, another king of Egypt, raised one of 45 cubits; and Ptolemy Philadelphus another of 88 cubits, in memory of Arsinoe. See Porphyry.

Augustus erected an obelisk at Rome, in the Campus Martius, which served to mark the hours on an horizontal dial, drawn on the pavement.

F. Kircher reckons up fourteen obelisks, celebrated above the rest; *viz.* that of Alexandria, that of the Barberins, those of Constantinople, of the Mons Esquilinus, of the Campus Flaminius of Florence, of Heliopolis, of Ludovisio, of S. Mahut, of the Medici, of the Vatican, of M. Cælius, and that of Pamphylia.

One of the uses of obelisks among the ancients was to find the meridian altitudes of the sun, at different times of the year. Hence they served instead of very large gnomons. One of the obelisks now standing at Rome, that of St. John's Lateran, is in height 108 English feet, without the pedestal; and the other obelisk, brought to Rome by Augustus, buried under the Campus Martius, wants but little of the same height. Pliny gives us a description of this gnomon, lib. xxxvi. sect. 15. From him it appears, that there was laid down, from the foot of the obelisk northward, a level pavement of stone, equal in breadth to the breadth of the obelisk itself, and equal in length to its shadow at noon, upon the shortest day; that is to say, that its length was to the height of the obelisk, almost as 22 to 10, and that under this pavement, there were properly let in parallel rulers of brass, whose distance from the point, directly under the apex of the obelisk, were respectively equal to the length of the shadow thereof at noon, on the several days of the year, as the same lengths decreased from the shortest day to the longest, and again increased from the longest day to the shortest. Vide Phil. Trans. N° 482. art. 5. vol. xliv. p. 365. where we also find some remarks by Mr. Folkes on Hardouin's Amendment of a Passage in Pliny's Natural History, lib. ii. sect. 74. Edit. Paris. 1723. fol. about the length of the

the ſhadows of gnomons in different latitudes. See GNOMON.

OBELISK, in *Grammar*, is a character in form of a dagger (†), ſerving to refer the reader to ſome note, or other matter, in the margin.

OBELUS, in *Antiquity*, denotes a little line or ſtroke, like a needle; whence its name ὀβελος, which ſignifies *needle*. The word is chiefly uſed in ſpeaking of Origen's Hexapla; wherein he diſtinguiſhes, with an aſteriſk or ſtar, the ſupplements he makes to the texts of the Septuagint, where it falls ſhort of the Hebrew meaning; and with an obelus or lineola (—), thoſe places where the Septuagint had any thing not in the Hebrew.

St. Jerom ſays, the obelus was only uſed in thoſe places where ſomething was to be retrenched from the Septuagint, as ſuperfluous, and the aſteriſk in thoſe that were defective. Theſe marks frequently occur in ancient manuſcripts. Uſually the obelus is accompanied with two dots, the one above, the other underneath, as (÷); and the aſteriſk is a St. Andrew's croſs, cantoned with four points.

OBENBERG, in *Geography*, a town of Auſtria; ſix miles E.N.E. of Sleyregg.

OBER, a river which flows from a lake on the borders of Poland and Sileſia, and runs into the Oder, four miles S. of Zullichan.

OBERBACH, a town of the duchy of Wurzburg; 10 miles N.W. of Kiſſingen.

OBERBERG, a bailiwick of Switzerland, belonging to the abbey of St. Gall.

OBERDORF, a town of Bavaria; 32 miles S. of Augſburg.

OBERGESTLEN, a town of Switzerland, in the Valais; 48 miles E. of Sion.

OBERHAUSBERGEN, a town of France, in the department of the Lower Rhine, and chief place of a canton, in the diſtrict of Straſburg, three miles N.W. of it. The place contains 329, and the canton 11,720 inhabitants, on a territory of 120 kiliometres, in 18 communes.

OBERINGELHEIM, a town of France, in the department of Mont Tonnerre, and chief place of a canton, in the diſtrict of Mayence. The place contains 1658, and the canton 10,623 inhabitants, in 18 communes.

OBERKIRCH, a town of the duchy of Baden; 12 miles E. of Straſburg. N. lat. 48° 33'. E. long. 8° 10'.

OBERKOTZAU, a town of Germany, in the principality of Bayreuth; 13 miles S. of Hof.

OBERLAND, a province of Pruſſia, formerly called "Hockerland," fertile and well cultivated. Before Pruſſia was invaded by the Teutonic knights, this province could furniſh for the field 10,000 effective men, conſiſting of horſe and foot; but as the inhabitants had exerciſed great cruelties towards the Chriſtians, the Teutonic knights, in 1273, laid the country waſte, and took poſſeſſion of it.—Alſo, a territory in the duchy of Courland, lying between the town of Seelburg and Lithuania.

OBERMOSCHEL. See MOSCHEL.

OBERNAI, a town of France, in the department of the Lower Rhine, and chief place of a canton, in the diſtrict of Barr. The place contains 4391, and the canton 13,164 inhabitants, on a territory of 110 kiliometres, in 11 communes.

OBERNBURG, a town of Germany, in the circle of the Lower Rhine; 16 miles E. of Darmſtadt.

OBERNDORF, a town of Germany, in the county of Hohenberg, on the Neckar; eight miles E. of Schramberg.—Alſo, a town of Bavaria, in the biſhopric of Bamberg; ſeven miles N. of Bamberg.—Alſo, a town of Germany, in the county of Henneberg; eight miles S.E. of Meinungen.—Alſo, a town of Bavaria, on the Inn; 12 miles S.S.W. of Paſſau.

OBERNHAU, a town of Saxony, in the circle of Erzgebirg; ſix miles W. of Lauterſtein.

OBERNKIRCHEN, a town of Auſtria; eight miles W. of Freyſtadt.

OBERROSLA, a town of Germany, in the principality of Culmbach; 13 miles S. of Hof.

OBERSDORF, a town of Bohemia, in the circle of Chrudim; 14 miles E.N.E. of Leutmiſchl.—Alſo, a town of Bavaria; 62 miles S. of Augſburg.

OBERSEE, a lake of Bavaria, one mile S. of Konigſee.—Alſo, a lake of Carinthia, one mile W. of Welach.

OBERSTADT, a town of Germany, in the county of Henneberg; ſeven miles E.N.E. of Meinungen.

OBERSTENFELD, a town of Wurtemberg; nine miles S.E. of Heilbronn.

OBERWALD, a town of Switzerland, in the Valais; 50 miles E. of Sion.

OBERWELS, or OBERWOLTZ, a town of the duchy of Stiria; 24 miles W. of Judenburg. N. lat. 47° 13'. E. long. 14°.

OBESITY, OBESITAS, in *Medicine*, the ſtate of a perſon too much loaded with fat and fleſh, otherwiſe called *corpulency*. See CORPULENCE.

OBEY, in the *Manege*. A horſe is ſaid to obey the hand and heels, to obey the aids or helps, when he knows and anſwers them according to demand.

OBIAN, in *Geography*, a navigable river of America, in Tenneſſee, which runs into the Miſſiſippi, 70 yards broad, at the diſtance of 17 miles from its mouth.

OBIDOS, a town of Portugal, in Eſtremadura, ſeated on a river which runs into the Atlantic, and forms a bay at its mouth called "Lagoa de Obidos." The town is defended by a ſtrong caſtle on a rock; 38 miles N. of Liſbon. N. lat. 39° 20'. W. long. 8° 59'.

OBJECT, derived from *objicere*, *to ſet before*, which is compoſed of *ob* and *jaceo*, *I lie againſt*, in *Philoſophy*, ſomething apprehended, or preſented to the mind, by ſenſation, or by imagination.

An object is ſomething that affects us by its preſence, that moves the eye, ear, or ſome other of the organs of ſenſe; or, at leaſt, is repreſented to us by the imagination.

The ſchool-philoſophers define object to be that about which a power, act, or habit, is employed. Thus, good is the object of the will; truth of the underſtanding; ſo colour is the object of ſight; ſound, of hearing, &c.

Objects are uſually divided into *next*, *proxima*, which are thoſe on which the power or habit is immediately employed; in which ſenſe colour is the next object of ſight. And *remote*, which are thoſe only perceived by means of the former: in which ſenſe, the wall is the remote object of ſight, ſince we only ſee it by means of its colour, &c.

Ideas are the immediate objects of the mind in thinking: bodies, their relations, attributes, &c. are the mediate objects.

Hence it appears, that there is a ſort of ſubordination of objects. But note, that a next object, with regard to a remote one, is properly a ſubject, not an object.

They alſo diſtinguiſh objects *per ſe*, which are what properly move or affect our ſenſes: ſuch are the ſenſible qualities; and objects *per accidens*, which are ſubſtances, and only affect us by being inveſted with ſenſible qualities.

Again, they diſtinguiſh between *common* objects, which are ſuch as affect divers ſenſes; as are motion, figure, &c. and *proper* objects, which only affect one ſenſe.

There

There are ſeveral conditions requiſite to an object of *ſenſe*; as, that it be material; that it be within a certain diſtance of a competent extent; its ſenſible qualities ſufficiently intenſe, &c.

It is the object that reflects or emits the rays of light, which occaſion viſion. Objects, of themſelves, are inviſible; we only ſeem to perceive them, becauſe the different texture of their ſurface, diſpoſing them to reflect differently coloured rays, occaſions in us ſeveral ſenſations of colour, which we attribute to them.

The objects of the eye, or viſion, are painted on the retina; though not there erect, but inverted, according to the laws of optics. This is eaſily ſhewn, from Cartes's experiment of laying bare the vitreous humour on the back part of the eye, and putting over it a bit of white paper, or the ſkin of an egg, and then placing the fore-part of the eye to the hole of a darkened room. By this means is had a pretty landſcape of the objects abroad, painted invertedly on the back of the eye.—How, in this caſe, the objects which are painted inverted ſhould be ſeen erect, is matter of controverſy. See CAMERA *Obſcura*, and VISION.

OBJECT-*glaſs* of a teleſcope or microſcope is the glaſs placed at the end of the tube which is next the object.

To prove the regularity and goodneſs of an object-glaſs, ſtrike two concentric circles on paper, the one having its diameter the ſame with the breadth of the object-glaſs; the other half that diameter; divide the inner circumference into ſix equal parts; and making ſix fine ſmall holes in it with a needle, cover one ſide of the glaſs with this paper; then expoſing it to the ſun, receive the rays that paſs through theſe ſix holes on a plane, at a juſt diſtance from the glaſs; and, by withdrawing or approaching this plane, from or to the glaſs, we ſhall find whether the rays, that paſs through theſe ſix holes, unite exactly together at any diſtance from the glaſs; if they do, we may be aſſured of the regularity of the glaſs, that is, of its juſt form; and, at the ſame time, we obtain exactly the glaſs's focal length.

Indeed, there is ſcarcely any better way of proving the excellency of an object-glaſs, than by placing it in a tube, and trying it with ſmall eye-glaſſes, at ſeveral diſtant objects; for that object-glaſs which repreſents objects the brighteſt and moſt diſtinct, which bears the greateſt aperture, and moſt convex and concave eye-glaſs, without colouring or hazineſs, is always the beſt.

A circular object-glaſs is ſaid to be truly centered, when the centre of its circumference is ſituated in the axis of the glaſs; and to be ill-centered, when the centre of its circumference lies beſide the axis.

To prove whether object-glaſſes be well-centered, hold the glaſs at a due diſtance from the eye, and obſerve the two reflected images of a candle; where thoſe images unite, or coaleſce, there is the true centre. If this be in the middle, or central point of the glaſs, then it is known to be truly centered.

There are various methods of finding the true centre of an object-glaſs: the following was the method uſed by Mr. George Graham. Let a couple of ſhort cylindrical tubes be turned in wood or braſs, and let the convexity of the narrower be ſo exactly fitted to the concavity of the wider, as juſt to turn round in it with eaſe, but without waddling; and let the planes of the baſes of the tubes be exactly perpendicular to their ſides. Place the baſe of the narrower tube upon a ſmooth braſs plate, or a wooden board, of an equal thickneſs, and with any ſharp-pointed tool, deſcribe a true circle upon the board round the outward circumference of the baſe; and upon the centre of this circle, to be found when the tube is removed, deſcribe a larger circle upon the board.

Theſe two circles ſhould be ſo proportioned, that the one may be ſomewhat greater, and the other ſomewhat ſmaller than any of the glaſſes intended to be centered by them. Then having cleared out all the wood within the inner circle, put the end of the tube into this hole, and there faſten it with glue, ſo that the baſe of the tube may lie in the ſurface of the board: then having fixed the wider tube very firmly, in a hole made in a window-ſhutter, and having darkened the room, lay the glaſs to be centered upon the board fixed to the narrower tube; and having placed the centre of it as near as you can gueſs over the centre of the hole, fix it to the board with two or three lumps of pitch, or ſoft cement, placed at its circumference. Then put the narrower tube into the wider as far as it can go, and fix up a ſmooth ſcreen of white paper to receive the pictures of objects that lie before the window; and when they appear diſtinct upon the ſcreen, let the inner tube be turned round upon its axis; and if the centre of the glaſs happens to be in this axis, the picture will be perfectly at reſt upon the ſcreen; if not, every point of it will deſcribe a circle. With a pencil mark the higheſt and the loweſt places of any one circle, deſcribed by ſome remarkable point in that part of the picture which appears moſt diſtinct; and when this point of the picture is brought to the higheſt mark, ſtop the circular motion of the tube, and keeping it in that poſition, depreſs the object-glaſs till the point aforeſaid falls exactly in the middle between the two marks. Then turn the tube round again, and the point of the picture will either reſt there, or will deſcribe a much ſmaller circle than before, which muſt be reduced to a quieſcent point by repeating the ſame operation. Then the centre (of refraction) of the glaſs will lie in the axis of the tube, and by conſequence will be equidiſtant from the circumference of the large circle deſcribed upon the board fixed to it. Now, to deſcribe a circle upon the glaſs *f g h*, (*Plate* XV. *Optics*, *fig.* 19.) about its centre of refraction, let a long ſlender braſs plate *a c b* be bent ſquare at each end, as repreſented in the figure, leaving a piece in the middle, equal in length to the diameter of the large circle *a d b e*, that was deſcribed upon the board; and let the ſquare ends of the plate be filed away, ſo as to leave a little round pin in the middle of each. Then having laid it over the glaſs, along any diameter of the large circle *a d b e*, make two holes in the board to receive the pins *a*, *b*; and find the centre of this circle upon the long plate; and with this centre, *c*, deſcribe as large a circle as you can, upon the glaſs underneath, with a diamond-pointed compaſs; and grind away all the margin as far as this circle *f i k*, in a deep tool for grinding eye-glaſſes; and then the glaſs will be truly centered. If the pitch, or cement, be too ſoft to keep the glaſs from ſlipping, while the circle is deſcribing, it may be fixed firmer with wax, or harder cement. Smith's Optics, book iii. chap. 3.

Mr. Savery gives the following rule, which is very convenient for the uſe of the glaſs-grinder, and will enable him expeditiouſly to try whether a convex lens is well centered. Provide a round plate of braſs (or hardened ſteel, if it can be prevented from ruſting), conveniently thick, and well hardened by hammering, having many notches round it, one a little wider than the next, and numbered 1, 2, 3, &c. in their proper order, each of them being wider at the bottom than at the entrance. (*Plate* XV. *Optics*, *fig.* 20.) Fit one of theſe notches to the thickeſt ſide of the object-glaſſes, ſo that the edge may reach to about half its depth; and if the oppoſite ſide paſs to the bottom of the notch, grind the lens narrower on the thinneſt ſide, till you find it at that part

as thick as where you firſt tried it in the notch. After this manner reduce the glaſs to an equal thickneſs on its four quarters, and then grind off from other places what is needful to make it circular: let care be taken, when the lens is tried in the notch, that it be not warmer on one ſide than the other by grinding, but ſtay till it is quite cold; and obſerve likewiſe not to thruſt it in harder on one ſide than on the oppoſite ſide. (Phil. Tranſ. vol. xlviii. p. 177, &c.) The chief advantage of having a glaſs well-centered is this, that the rays coming through any given hole or aperture, whoſe centre coincides with the axis of the glaſs, will form a more diſtinct image than if that centre lay beſide the axis; becauſe the aberrations of the rays from the geometrical focus of the pencil, are as the diſtances of their points of incidence from the centre of refractions in the glaſs.

As object-glaſſes are commonly included in cells that ſcrew upon the end of the tube of a teleſcope, one may examine whether they be well-centered, by fixing the tube, and obſerving while the cell is unſcrewed, whether the croſs-hairs keep fixed upon the ſame lines of an object ſeen through a teleſcope. See CENTERING.

OBJECT is alſo uſed for the matter of an art or ſcience; or that about which it is employed.

In which ſenſe the word coincides with *ſubject*.

The ſchool philoſophers diſtinguiſh divers kind of objects in the ſame ſcience; *viz. material*, which is the thing itſelf that is conſidered, or treated of; and thus it is the human body, which is the object of medicine: *formal*, which is the manner of conſidering it; and thus the ſame human body, conſidered with a view to the healing of it, is the *formal* object of medicine.

OBJECTION, in *Reaſoning*, ſomething urged to overthrow a poſition; or a difficulty raiſed againſt an allegation, or propoſition, of a perſon with whom we are diſputing.

The anſwering of objections comes under that branch of oratory, or that part of an oration, called *confirmation*, or *confutation*.

OBJECTION, *Over-ruling an*. See OVER-RULING.

OBJECTIVE, OBJECTIVUS, is uſed in the ſchools in ſpeaking of a thing which exiſts no otherwiſe than as an object known.

The eſſe, or exiſtence of ſuch a thing, is ſaid to be objective. Others call it *ratio objectiva*.

OBJECTIVE is alſo uſed for the power, or faculty, by which any thing becomes intelligible. And for the act itſelf, whereby any thing is preſented to the mind, and known.

Hence a thing is ſaid *to exiſt objectively*, *objectivè*, when it exiſts no otherwiſe than in being known, or by being an object of the mind.

This ſome will have to be real eſſe; others deny it.

OBJECTIVE *Evidence*. See EVIDENCE.

OBJECTIVE *Line*. See LINE.

OBJECTIVE *Notion*. See NOTION.

OBJECTIVE *Plane*. See PLANE.

OBJECTUM *quod complexum*, of an art, is the aggregate whole, or a collection of all the objective concluſions, or conſequences found in the ſcience.

OBJECTUM *quod incomplexum*, is a collection of all the ſubjects of the objective concluſions. Thus, therefore, air, as elaſtic, is the *complex* object of one branch of phyſics; and air itſelf, or the ſubject of the concluſion, the *incomplex* object of the ſame branch.

OBJECTUM *quo complexum*, is a collection of all the objective antecedents of the ſcience.

OBJECTUM *quo incomplexum*, is a collection of all the mediums, or arguments, contained in thoſe antecedents, and whereby thoſe concluſions are proved.

In theſe caſes, the object is ſaid to be *complex*, inaſmuch as it includes both an affirmation and negation; and *incomplex*, as it includes neither: *quod*, as being that which (*quod*) is ſhewn in the ſcience; and *quo*, as being that whereby (*quo*) the concluſions therein are proved.

Schoolmen alſo diſtinguiſh other objects, which it is needleſs to mention.

OBIIT NUPER. See NUPER.

OBILA, in *Geography*, a province of the interior parts of Africa.

OBIONE, in *Botany*, Gærtner, v. 2. 198. t. 126, a genus formed by that author, of the Linnæan *Atriplex fibirica*, becauſe its male flowers are four-cleft and tetrandrous, and, more eſpecially, on account of the inverted poſition of the ſeed and its embryo. This plant is ſo perfectly an *Atriplex* in every other reſpect, that we preſume to think the laſt-mentioned character is not always infallible any more than the others, at leaſt when the embryo is circular.

OBIT, OBITUS, in our *Ancient Cuſtoms*, was a funeral ſolemnity, or office for the dead; commonly performed when the corpſe lay uninterred in the church.

OBIT is alſo an anniverſary office or maſs, held yearly, in the Romiſh church, on a certain day, in memory of ſome perſon deceaſed.

One of the moſt ancient obits in Europe is that of king Childebert, founded in the abbey of St. Germains Deſprez, and ſaid on the eve of St. Thomas's day.

The tenure of obit, or chantry-lands, held of the ſubject by ſuch ſervice, is decreed to be extinct with us, by ſtat. 1 Edw. VI.

OBITEREA, in *Geography*, an iſland of the Pacific ocean, 100 leagues S. of the Society Iſlands. S. lat. 22° 40′. W. long. 150° 50′. This iſland has no good anchorage.

OBITUARY, OBITARIUM, a funeral regiſter, in which are written the names of the dead, and the days of their burial; for whom obits, or anniverſaries, are to be performed.

Theſe, in ſome places, are alſo called *mortuaries*; but more frequently *necrologies*, or *calendars*.

OBITUARY is more particularly uſed for a book containing the foundation or inſtitution of the ſeveral obits in a church or monaſtery.

This is more frequently called the *Martyrology*.

OBLADA, in *Ichthyology*, a name given by ſome to the melanurus of authors, a fiſh of the ſparus kind, diſtinguiſhed by Artedi by the name of the ſparus variegated with longitudinal lines, and with a large black ſpot on each ſide near the tail. See SPARUS *Melanurus*.

OBLATA, things given, or voluntarily offered, particularly to the king by any of his ſubjects.

They are thus called, becauſe the oblata, or offerings to our kings, were ſo ſtrictly looked to in the reigns of king John and Henry III., that they were entered in the fine-roll under the term oblata; and, if not paid, were put in charge to the ſheriff.

OBLATA, in the *Exchequer*, ſignify old debts; brought, as it were, together, from preceding years, and put to the preſent ſheriff's charge.

OBLATA is alſo a word uſed by ſome authors to expreſs a ſort of purging tablet, made of fine flour and ſugar, with ſome purging ingredients.

OBLATÆ is alſo uſed to ſignify the conſecrated wafers, or hoſts, diſtributed to the communicants in the maſs or ſacrament of the altar; and ſometimes the cuſtomary treats in religious houſes have been called by the name of *oblatæ*.

OBLATI, anciently, were ſecular perſons, who be-

ſtowed themſelves and their eſtates on ſome monaſtery, and were admitted as lay-brothers.

There were ſome of the oblati, properly called *donati*, who gave their perſons, their families, and effects; and even entered into a kind of ſervitude themſelves, and their deſcendants.

They were admitted by putting the bell-ropes of the church round their necks, and, as a mark of ſervitude, a few pence on their heads.

The donati took religious habits, but different from thoſe of the monks.

In the archives of the abbey of St. Paul de Verdun is a permiſſion given in 1360, to a man of that abbey to marry a wife; on condition, that, of the children ariſing from the marriage, one-half ſhould belong to the abbey, in quality of oblati; the other half to the biſhop. This kind of oblati are ſaid to have taken their firſt riſe in the eleventh century.

In the earlier times, thoſe only are called oblati, whom their parents engaged from their infancy to the monaſtic life. Thoſe who embraced it themſelves, when at an age capable of choice, were called *converts*, *converſi*.

The oblati made no profeſſion; yet kept the celebate, lived in obedience to the ſuperiors, and did the drudgery of the monaſtery: yet they differed from the ſervants of the houſe, who were allowed to marry.

The oblati and donati were, properly, ſervants by devotion, as the others were by condition.

Helyot ſays, the oblati differed from converts, inaſmuch as the latter made the profeſſion, and wore the habit, which the former did not.

Oblati were alſo, in France, a kind of lay-monks, anciently placed by the king in all the abbies and priories in his nomination; to whom the religious were obliged to give a monk's allowance, on account of their ringing the bells, and ſweeping the church, and the court.

Theſe offices were uſually filled with lame ſoldiers, and invalids, ſome of whom had penſions on benefices, without any duty. But theſe oblati, with their penſions, have ſince been all removed to the hotel of the Invalids at Paris.

OBLATIONS, Offerings, properly denote things offered to God.

In the canon law, oblations are defined to be any thing offered by godly Chriſtians to God, and the church, *i. e.* to the prieſts, whether they be moveables, or immoveables.

Oblations, were anciently of various kinds, *viz. oblationes altaris*, which the prieſts had for ſaying maſs: *oblationes defunctorum*, given by the laſt wills of the faithful to the church: *oblationes mortuorum*, thoſe given by the relations of the dead, at their burials: *oblationes pœnitentium*, thoſe given by penitents: and *oblationes pentecoſtales*, or Whitſun-offerings.

Till the fourth century, the church had no fixed revenues, nor any other means of ſubſiſtence but alms, or voluntary oblations.

Under this term are now comprehended not only thoſe ſmall-cuſtomary ſums commonly paid by every perſon, when he receives the ſacrament of the Lord's Supper, at Eaſter, which in many places is 2*d.* from every communicant, and in London 4*d.* a houſe; though it does not appear on what their opinion of a groat a houſe for London is founded; but alſo the cuſtomary payments for marriages, chriſtenings, churchings, and burials. The four offering days are Chriſtmas, Eaſter, Whitſuntide, and the feaſt of the dedication of the pariſh church. It hath been decreed, with regard to Eaſter offerings, that they are due of common right, and not by cuſtom only. Offerings may be recovered before the juſtices of the peace, by the ſmall tythe act of 7 and 8 Will. cap. 6.

Offerings are made at the holy altar by the king and queen twelve times in the year on feſtivals called "Offering days," and diſtributed by the dean of the chapel to the poor. The money in lieu of theſe accuſtomed offerings is now fixed at 50 guineas a year, and paid by the privy purſe annually to the dean or his order; for the diſtribution of which offertory money, the dean directs proper liſts of poor people to be made out.

OBLAY, in *Geography*, a town of Lithuania, in the palatinate of Wilna; 12 miles S. of Braſlau.

OBLIGATION, an act whereby a perſon engages, or binds himſelf, or is bound by another, to do ſomething; as to pay a ſum of money, to be ſurety, or the like.

The acceptance of a bill of exchange is a kind of obligation to pay it.

All obligations ariſe from contracts, or quaſi-contracts; from crimes, or quaſi-crimes; and, in the Roman law, were either civil, or prætorian; *i. e.* either approved by the civil law, or introduced by the prætor.

There are three kinds of obligations; *natural*, *civil*, and *mixt*.

*Natural* obligations are founded on the mere bond of natural equity, without any civil neceſſity, and without producing any action of conſtraint. Such are the obligations a minor is under.

*Civil* obligation is that ſupported by civil authority alone, and which induces a conſtraint, without any principle or foundation in natural equity. Such is the obligation on a man condemned unjuſtly.

*Mixt* obligation, or an obligation both natural and civil, is that which, being founded in natural equity, is farther confirmed and enforced by civil authority.

There are alſo *perſonal* obligations, *hypothecary* obligations, obligations of goods, body, &c.

Obligation, in a more ſtrict ſenſe, denotes a bond containing a penalty, with a condition annexed, for payment of money at a certain time; or for performance of covenant, or the like. See Bond.

A bond, or obligation, is ſaid to differ from a bill, in that the latter is commonly without a penalty, and without condition. Yet a bill may be obligatory. Coke on Littleton.

Till the Conqueſt, writings were rendered obligatory by certain marks of gold croſſes, &c. The Normans firſt introduced the cuſtom of making bills and obligations with a print or ſeal in wax, ſet to every one's ſignature, atteſted by three witneſſes.

Obligation, *Moral*, or *Obligation of virtue*, in *Ethics*. See *Moral* Philosophy, and Virtue.

OBLIGATO, in the *Italian Muſic*, ſignifies *for*, *on purpoſe for*, or *neceſſary*, as *doi violini obligato*, on purpoſe for two violins; and ſo of other things, as *con fagotto obligato*, that muſt be played with a baſſoon, &c.

Sometimes it ſignifies confined, or reſtrained, by certain rules, ſubjected to certain limits or laws, in order to perform ſome particular thing, to give ſome particular expreſſion of a paſſion, action, &c. In this ſenſe we ſay, *contrapunto obligato*, *fuga obligata*, &c. We alſo ſay, the baſe is obligato, when it is only a ground of a certain number of bars, which are to be repeated over and over; ſuch is the baſe to chacones, &c. and every baſe in which airs are confined to a certain ſeries of notes often repeated to different trebles. See Ground.

OBLIGE', Fr. Obligato, Ital. the part of a compoſition ſaid to be obligato, is in general the principal treble; but it is likewiſe applied to any part which cannot be omitted without injuring the harmony, melody, and deſign. What

diſtinguiſhes

diſtinguiſhes it from all the other ſubordinate parts, that are only added to enrich the harmony, is, that if retrenched, the piece will be mutilated. Thoſe who perform the ripieno parts, may ſtop whenever they pleaſe, and the piece nevertheleſs will go on; but the performer to whom an obligato part is aſſigned, cannot ſtop a moment without being miſſed.

OBLIGEE, in *Law*, is the party to whom an obligation, or bond is made.

OBLIGOR, the party who enters into or executes an obligation, or bond.

OBLIQUATION, in *Catoptrics*. *Cathetus of obliquation* is a right line drawn perpendicular to a mirror, in the point of incidence, or reflection of a ray. See CATHETUS.

OBLIQUE, in *Geometry*, ſomething aſlant, indirect, or that deviates from the perpendicular.

OBLIQUE *Angle*. See ANGLE.

OBLIQUE-*Angled Triangle*, is that whoſe angles are oblique; *i. e.* either obtuſe, or acute.

OBLIQUE *Arches*. Whenever high roads run oblique to the courſe of any river, rivulet, drain, or canal, neceſſary to be paſſed over by a bridge, the direction of the *former* is generally varied ſo as to be rectangular to the courſe of the *latter;* unleſs in ſmall ſtreams, over which, when their courſe is not made to ſuit the road, there are ſeveral inſtances of the conſtruction of what are uſually termed *ſkew-bridges*. Theſe, with the exceptions which will be afterwards mentioned, have been built in the uſual manner of laying each courſe of ſtones or bricks of the arch parallel to the line of the abutment, and bevelling off their ends, on each exterior face of the arch, in a line correſpondent with the intended direction of the road over the bridge, as ſhewn in *fig.* 1. In this figure it is obvious, that ſo far as one abutment of the bridge extends beyond the rectangular line from the extremity of the other, ſuch a portion of arch, *viz. a b*, has no ſupport from the oppoſite abutment, unleſs what may be derived from the interlapping or breaking joint of the bricks or ſtones compoſing the arch; and from the goodneſs of the mortar, tending to cement them into one maſs: therefore, accordingly as theſe circumſtances have operated, and alſo in proportion to the ſmallneſs of the arch, in which the parapet covers a larger ratio of the unſupported part of it, the ſkew-bridges thus built have ſtood more or leſs firm, with an obliquity of 10° to 15° from a rectangle with the abutment; and in many inſtances, that portion of the arch has cracked or given way. Theſe circumſtances have prevented cautious builders from adopting this method; and induced them, in a few inſtances, to build the arch ſquare to its abutments, and run the parapets oblique, to coincide with the line of road; leaving alternate triangles of the arch on the outſide, which has a diſagreeable appearance, and has ſeldom been uſed; therefore, in general, unleſs the courſes of ſtreams or canals were made rectangular to the road, the line of the latter has been altered ſo as to admit of a direct paſſage over the water, which upon high roads, when not curved for a conſiderable diſtance, is inconvenient if not dangerous; and particularly ſo to travellers in the night time; from which cauſe the ſkew-bridges deſcribed were, with all their imperfections, occaſionally had recourſe to; and the writer of this article has never heard of any alteration in their form prior to the year 1787. At this time he had the direction of the county of Kildare canal, a branch from the Grand Canal of Ireland to the town of Naas.

In the courſe of conducting the work, ſeveral of the directors of that canal were anxious to have the line of the roads unvaried; therefore our author was led to conſider whether the uſual imperfect method could not be ſet aſide, by the ſubſtitution of one on ſound principles; and it then occurred that its leading feature muſt be, that the joints of the voiſſoirs, whether of brick or ſtone, ſhould be rectangular with the face of the oblique arch, in place of parallel with its abutment; and, conſequently, the bridges over the county of Kildare canal were made to ſuit the line of road, although the obliquity of one of them was carried to an extent beyond what he deemed eligible in practice, as will appear from the obſervations made on Finlay bridge, near the town of Naas, which deviated 51° from a rectangle with the canal, and conſequently formed the acute angle of 39° with its abutments. Its ſpan, in that oblique direction, was 25 feet, and its pitch 5 feet 6 inches, or nearly $\frac{2}{9}$ths of its ſpan. The plan of this bridge is given in *fig.* 2, and in *fig.* 3. the elevation of its arch, more to ſhew the extent to which it has been carried than to recommend its propriety; principally becauſe of the difficulty of forming the voiſſoirs of the impoſt courſe; and alſo, becauſe to retain the ſame breadth of roadway, the bridge muſt be enlarged as the ſecant of the angle of obliquity is to radius, *viz.* as *a b* to *a c*, which in the preſent inſtance is as 159° to 100°; likewiſe, for general purpoſes, one breaſt-wall on each ſide muſt be conſiderably extended to coincide with its oppoſite one, or nearly ſo; alſo, the impoſt courſe muſt be ſerrated, as ſhewn in the explanation of *fig.* 8; and as the lines, in which the beds of the voiſſoirs run, are obviouſly ſpiral lines, it follows that the ſoffit of each ſtone muſt be curved in that direction, and likewiſe it muſt be twiſted in its ſommering, which, although not inſuperable difficulties, are ſo in ſuch a degree, as, combined with the indented form of the impoſt, to render it adviſable to uſe bricks, both for the impoſt and arch, or at moſt to be contented with the uſe of ſtone only for the quoins and their neceſſary impoſts, in the forming of which intelligent ſtone-cutters will be requiſite, as will appear from *fig.* 3, where a part both of the intrados and extrados of the arch is ſhewn as viewed from an infinite diſtance, not being reduced in perſpective. It is there apparent that the head of each voiſſoir on that ſide of the arch where its face forms an acute angle with its abutment, muſt make an obtuſe angle with its ſoffit, decreaſing in their approach to the crown of the arch, and thenceforward becoming acute, and increaſing as they advance to the other impoſt, where the face of the arch forms an obtuſe angle with its abutment; therefore the different ſides of the ſame voiſſoir muſt form different angles of elevation or depreſſion from the rectangle with its head.

A geometric mode of forming each voiſſoir would be complicated, as will appear from the following diagrams, *viz.* let the lines *a b*, *b d*, and *d c*, in the diagram, *fig.* 4, include a portion of the ſpace to be covered by the arch, *a b* and *c d* being the lines of its abutments: then let the diſtance intercepted between *d b*, and its parallel line *x y*, which likewiſe extends between the abutments, expreſs the extent to be covered by any given number of the voiſſoirs forming that portion of the ſoffit, ſuppoſe every alternate one:—let the circular arcs raiſed upon each of theſe lines expreſs the elevation of the arch at each place reſpectively; *u* and *v* will then ſhew the crowns of their ſoffits. The line *t t*, drawn at right angles with the face of the arch, and with its reſpective extremities equidiſtant from the points *u* and *v*, will repreſent a joint on the ſoffit, which muſt neceſſarily be horizontal at its extremities; becauſe equidiſtant from the crown of each arc, although on alternate ſides; then if equal ſpaces on each ſide of the point, *t*, be ſet off on each reſpective arc, it will ſhew upon each where the joints of the ſame voiſſoirs will coincide. Four of theſe ſpaces in the

arc *d u b*, which repreſents the front of the arch, reach from *t* to *d*, *viz.* to the abutment on the ſide, where it forms an obtuſe angle with that front, whilſt the ſame number of ſimilar ſpaces *in the like direction* extend only from *t* to 4, in the arc *x v y*, repreſenting the internal end or extreme extent of the voiſſoirs ſeen on the face of the arch. The ſame circumſtances are reverſed on the ſide where the front forms an acute angle with the abutment, as ſhewn by the ſimilar references on the other ſide of *t t*: conſequently the joint 4, in front of the arch, will fall into the impoſt at *y* on the rear line. The radiating lines riſing above each arc, drawn from their reſpective centres *h* and *g*, ſhew the twiſt or different ſommering lines at each extremity of the ſame joint: the difference of theſe divergencies would be more clearly ſeen by exhibiting ſimilar lines upon the arc *r v s*, which repreſents that of *x v y*, upon the ſame level as the front arc *d u b*, preſerving an equal lateral diſtance between them, which as it may be eaſily conceived is left undone, becauſe they would interfere with the lines requiſite for the further explanation of the ſubject. The points, *r* and *s*, upon the laſt deſcribed arc, correſpond with *x* and *y* upon that for which it is ſubſtituted, every remaining letter or figure of reference being the ſame in both.

The vertical ſpaces on the acute ſide of the arch intercepted between 4 *s*, 3 3, &c. until they become horizontal at *t*, ſhew the proportionate depreſſion of the ſoffit of the joints they repreſent; and on the other ſide, *d* to 4, on the lower dotted arc; 3 3, &c. ſhew the riſe on each voiſſoir abutting on theſe points. The horizontal baſe between the extremities of each joint is ſhewn by the lines *d n*, *z m*, *k k*, &c. which extend between the chords *d b* and *x y*, from the points found by the interſection of the ordinates from the correſpondent numbers of their reſpective curves. The horizontal baſe, *k k*, is the only one that is rectangular to the chord of the arc; all the other baſes diverging towards that abutment which forms an obtuſe angle with the arch, and increaſing towards the haunches. At the firſt view of the diagram they appear to diverge both ways, but on inveſtigation it will be ſeen that the letter *n*, on the ſide of the acute angle, has reference to the front arc, and on the other ſide refers to that repreſenting the inner end of each joint. From theſe data we ſhall proceed to ſhew the longitudinal ſection or ſide elevation of a voiſſoir at *t t*, and other parts of the arch: *k k*, *fig.* 5, correſpondent with *k k*, *fig.* 4. but on a larger ſcale, expreſs the baſe of the voiſſoir, and *k r*, its height of face, or its width of bed; which latter may be aſſumed to be ſimilar in the others, *viz. d i*, *fig.* 6. and 4 *i* *fig.* 7. The riſe of the curve in the ſoffit between *k* and *k*, muſt obviouſly be equal to the difference between the ordinates *t k* and *u e*, *fig* 4, becauſe the crown of the arch ſhewn by the line *r u*, muſt be interſected at half-way between *t*, *t*, the extremes of the voiſſoir; one end of the ſtone being on that ſide of the crown deſcending to the left, and the other extremity equidiſtant on the ſide deſcending to the right. The breaſt-wall is ſhewn riſing rectangular from this voiſſoir. *Fig.* 6. upon the principles already explained, ſhews on the ſide where the front line of the arch makes an obtuſe angle with its abutment, the voiſſoir riſing from the ſpringing point at *d* to 4, on the poſterior arc which correſponds with its inner extremity; and *fig.* 7. exhibits, on the ſide where the front is acute with its abutment, the bed of a voiſſoir commencing at 4, on the front arc *d u b*, and decending to the abutment at *s*, on the arc repreſenting the other extremity. By theſe diagrams it appears, that under equal widths of bed the ſpace between the intrados and extrados increaſes upon the face of the arch as the haunches of the arch are approached: therefore the rough blocks for the voiſſoirs muſt be increaſed in their breadth of face to allow for the further divergency of their ſommering lines, ariſing from their height of face, or difference between intrados and extrados, being increaſed as the ſecants of their angles of deviation from a rectangle with a line between each extremity of their ſoffit: *viz.* as *d z* is to *d i*, *fig.* 6, or 4 *r* to 4 *i* in *fig.* 7. And if the twiſt of the ſommering lines be attended to, the long voiſſoirs muſt have a ſtill greater width of block between their beds than the ſhort ones: therefore, previouſly to the fitting each ſtone to its individual place, as the work advances nothing more can eaſily be done than giving due allowance to the firſt of theſe variations, which will be ſufficient in practice where the arch, excepting its quoins, is formed of brick; becauſe the facility of making the brick ſheeting break joint with the ſtone voiſſoirs of the face, will render it unneceſſary to twiſt the beds of the latter, and with the precaution mentioned, and the neceſſary aid of a bevil rule with a moveable joint, and its long arm formed of ſhort jointed links to ſuit the curve of the ſoffit, in the direction of each ſtone and towards the haunches on each joint of it, the operations of fitting each voiſſoir to its place will not be difficult.

*Fig.* 6. ſufficiently ſhews the danger of the breaſt or face-wall ſliding outwards on the acute angles of the ſoffit; therefore, when the obliquity of the arch is carried near to that of Finlay bridge, which theſe diagrams repreſent, either the breaſt-wall ſhould be curved, where it forms an obtuſe angle with the abutment, or the voiſſoir ſhould have offsets, which may be of the breadth of a brick, if the wall be built of that material, to form a ſtop to its ſlipping forward, as ſhewn by the dotted lines under it in *fig.* 6.

We ſhall now point out ſome anomalies from the leading principle which are neceſſary to be adverted to, for a due knowledge of the mode of conſtructing oblique bridges.

A ſemicircular arch obviouſly covers a ſemi-cylinder; and a leſſer portion of the arc of a circle will conſequently cover a ſimilar portion of it. If it be ſuppoſed, in either inſtance, that the cylindric ſegment, lying horizontally on its plane, with its axis in the direction of its abutments, is longer than neceſſary for the road-way over it, in any given oblique direction; we then, to obtain an oblique arch, have only to conceive the convex face of the cylindric ſegment to be cut down between two parallel vertical planes, in the direction required. But this arch, from the nature of cylindric ſections, will be elliptic; which is not ſo eligible in practice, becauſe of its quicker riſe at the haunches of the arch, the inconveniencies of which have already been explained; and they obviouſly militate not only againſt the elliptic form, but alſo any near approach to a ſemicircle.

We have obſerved that the leading principle of theſe oblique arches is, that each courſe of voiſſoir ſhould run rectangular to the face of the arch. This, however, muſt be taken in a limited ſenſe; becauſe if the ſheeting, or bed of the arch, were unfolded, or laid into a plane, its faces on the two extremities, bounding the paſſage over it, would not be ſtraight lines parallel to each other, like the parapet walls; but would form two curved lines, each convex where the line of the arch is acute with the abutment, and concave when it approaches the other ſide where the intercepted angle is obtuſe. This irregularity neceſſarily ariſes from the circumſtance, that each front line of the ſheeting, *m g p*, and *n h q*, *fig.* 8, in its courſe from the crown of the arch, in a direction oblique to *g h*, (the axis of the vault tranſverſe to the abutments,) muſt not, in its ſpiral gyration along the ſurface of the cylindric ſegment on each ſide of

*g h*,

*g h*, advance through equal ratios of the axis, in equal portions of the arc, but ſimply as the reſpective horizontal baſes of theſe portions: therefore its deviation from a line rectangular with the axis becomes progreſſively leſs in its approach to each abutment.

The greater or leſs curvature of the two faces of the arch, when drawn out as a plane, muſt depend on the greater or leſs pitch of the arch, as ſhewn in *fig.* 8; where *r s* and *t d* are the abutments of the bridge, and, conſequently, *r s d t* the baſe of the arch. The angle of obliquity is here 51°, as in the preceding diagram: the line *g h* paſſes along the crown of it; and the curved lines, *g m* and *h n*, terminated by the line *m n*, exhibit half the arch of Finlay bridge, drawn out as a horizontal plane; *m n* and *t d* being parallel to, and rectangular from each other; and their diſtances from the crown of the arch, *g h*, in their reſpective lines, *g m*, *h n*, and *g t*, *h d*, being in one the length of the ſemi-arc, and the other that of its baſe. On the other ſide of the line *g h*, the curved lines, *g p* and *h q*, connected by the right line *p q*, ſhew the form of half a ſemicircular arch of the ſame baſe, drawn out into a plane. In both exhibitions, it is clear that lines drawn perpendicular to different parts of the face of the arch, to ſerve as guide-lines to the joints of the ſoffit, would in one part converge to each other, and form triangles; and in the other part, where the face-line extended on a plane is concave, would diverge, ſo as, in both inſtances, to occaſion great irregularity and difficulty in cloſing of the arch; which actually takes place in practice, unleſs due attention be paid to its leading principles, which have been pointed out in the explanation of *fig.* 4, ſo far as that diagram enabled them to be; which, although not to the extent requiſite for the conſtruction of the arch, may be made perfectly comprehenſible to any practical man, by attention to the following inſtructions, *viz.* after the centres, which are placed parallel to the face of the arch, and diagonally to its abutment, are put up, and covered with their plank-ſheeting, carefully ſet off their bounding-lines, *m p* and *q n*, as in any other arch; ſo that every part of theſe face-lines ſhall be perpendicular to, or directly under, a horizontal line ſtretched from *r* to *t*, or from *s* to *d*, upon the level of the crown of the arch. Then, equidiſtant from each abutment, *viz.* along the crown of the arch, ſtrike the line *g h*, which will of courſe be a ſtraight line. Divide it into any given number of equal parts: if very oblique, ten or twelve may be ſufficient; and in arches of ſmall obliquity, a few diviſions will do. The preſent diagram (*fig.* 8.) is more oblique than will probably be adopted; but the ſcale being minute, the line *g h* is divided into only ſix parts, as the purpoſe of explanation will be equally well attained.

The figures 1, 2, 3, &c. in ſucceſſion from *h* to *g*, ſhew the diviſions on that line; and *a*, *b*, *c*, &c. exhibit correſpondent ſpaces cloſe to each abutment. Theſe diviſions being made, ſet out, on the ſheeting, ſo many parallel lines to the outer faces, *m g p*, and *n h g*, *viz.* *a* 1 *a*, *b* 2 *b*, &c.: *k* 1 repreſents a line of joint near the crown of the arch, and rectangular to its face; which commencing at the diſtance of *h k*, will interſect *h g*, the line of the crown, at the diſtance of *h* 1, from the face of the arch; and will repreſent half the line, *t t*, in diagram, *fig.* 4.

By the theory laid down for theſe arches, the joints on their ſoffit are to run parallel to each other; or rather they are to interſect equal portions of parallel equidiſtant arcs, ſtanding in a line oblique to their common axis. This end may obviouſly be obtained, by ſetting off on each face of the arch, and on each of the parallel equidiſtant lines, *a* 1 *a*, *b* 2 *b*, &c. ſpaces ſimilar to *h k*, in ſucceſſion after each other from the points *h* 1, 2, 3, 4, 5, and *g*, towards each abutment; and then to mark upon the ſheeting ſtrong lines, to direct the courſe of the joints, ſuch as ſhewn by *k* 1, 1 *u*, *u v*, &c. which will form a polygonic curve, more or leſs approaching to a regular curve, according to the obliquity of the arch, and its approximation to a ſemicircle, and the number of diviſions between *h* and *g*. The horizontal baſes of the ſoffit joints near the abutments, on each ſide of the arch, are, as ſhewn in *fig.* 4, inclined from the line of the face towards that abutment which forms with it an *obtuſe* internal angle: notwithſtanding which, theſe joints, when drawn on the plane of the ſheeting, deviate from the rectangle, with its face line *towards* the abutment which forms an *acute* internal angle with the line of the arch, and *from* the abutment on the oppoſite ſide, as ſhewn by thoſe lines in *fig.* 8.

Theſe excentricities, although they render it difficult to form all the voiſſoirs prior to the commencement of the arch, are eaſily got over by forming them in ſucceſſion, as deſcribed.

As the lines, *a* 1 *a*, *b* 2 *b*, &c. over the curve of the arch will be rather troubleſome to form correctly, the beſt mode in practice will be to mark off on each face, and each ſide of the arch, a continuation of the ſpaces, *q i* and *h k*, towards each abutment. Then as the progreſſive correſpondent points from *g* and *h*, *viz.* *i f*, *o l*, &c. will have right lines between them, ſtraight chalk-lines can eaſily be ſtruck; and when the ſpaces, *h* 1, *h* 2, &c. are ſet off upon each of them, the interſecting points ſimilar to *u*, *v*, *x*, &c. will be found the ſame as upon the lines *a* 1 *a*, *b* 2 *b*, which, therefore, have no occaſion to be formed.

Had the number of diviſions on the line *h q* been greater, the curvature of the joint lines would have appeared more material on that ſide of the diagram, exhibiting a ſemicircular arch expanded; but on the other ſide, where the arch is of the flat pitch deſcribed, but with great obliquity, the deviation from right lines is ſo much leſs ſo, that in brick-work the joint-lines may eaſily be followed. In ſimilar arcs of moderate obliquity, the divergency is of courſe leſs; but yet it will, unleſs the arch approach within about 20° of a rectangle with its abutments, be ſufficient to occaſion conſiderable irregularity, if the joint-lines be continued acroſs, rectangular from either face.

We had frequent opportunities of ſeeing, for ſeveral years after it was built, the bridge from which moſt of the diagrams have been drawn, and never obſerved any crack in it; but yet from the uncertainty of obtaining careful and intelligent overſeers, and good materials, and likewiſe becauſe of the greater expence, and not having inveſtigated the ſubject in all its bearings, ſo as to lay down ſufficiently plain inſtructions, we did not then, in ſeveral bridges over the Grand Canal of Ireland, which we directed to be built obliquely, and in other bridges, ſubſequently, over wide drains in the Eaſt Riding of Yorkſhire, venture to exceed 40° of obliquity, and rarely 30°, although the angle of interſection of the road and water was generally more conſiderable. It is clearly evident that this extent of angle would often be highly uſeful, as it would rarely leave much to be made up by the deviation of the road from its uſual direction. The wing-walls of Finlay bridge were curved one more than the other on the ſame ſide, to give a paſſage along each bank of the canal; but where not over a canal, if the line of direction of the road coincide with that of the bridge, the wing-walls may terminate more nearly ſquare with the road, or completely ſo, as in *fig.* 9, which ſhews one of theſe bridges under an obliquity of about 40°, with the *arch uncloſed*, ſo as to ſhew the wood ſheeting ſupporting it,

it, and the mode of closing it without unequal pressure on each side of the centres.

From what has already been explained, it necessarily follows that each impost of the arch, in place of being simply sommered to the radiating line of the incumbent curve, must also, as appears in *fig.* 3, be serrated (as shewn between *e* and *c*, *fig.* 8.) to suit the adjoining bed of the stones, or bricks, forming the arch.

The casual utility of these arches is obvious, and the theoretic and practical mode of forming them has been explained to such extent, as to make the process easy to any intelligent mason. Since the period we have mentioned, the plan has in a few instances been followed; and the same idea may have occurred to others, although we have never heard of it.

The principal use of these bridges will be where lines of projected canals interfect high roads with obliquity; in which case, the road, if curved for a sufficient extent to fall in with a rectangular passage over the canal in so gentle a manner as it ought, would require a considerable length of double curve, *viz.* alternately outwards and inwards on one side, or both, accordingly as the bridge might be placed, an instance of the latter of which is shewn in sketch N° 10. Under this predicament, where the land is valuable, or houses interfere to interrupt the change of road, it may often be found advantageous, because more economical to incur the increase of expence attendant on the construction of an oblique bridge; which, under moderate angles of departure from the right line across, is not very material; and where it becomes so, will sometimes be greatly inferior to the advantages acquired by it. We have been indebted for the preceding article to — Chapman, esq. a well-known and ingenious engineer, to whom we have already referred under the article CANAL.

OBLIQUE *Circle*, in the stereographical projection of the sphere, any circle that is oblique to the plane of projection.

OBLIQUE *Leaf*, in *Botany*, is so twisted, that one part becomes vertical, while the other is horizontal. The term *obliquum* is sometimes, less correctly, applied to a leaf unequal at the base, or sides, as in *Begonia* and *Eucalyptus*; in both which it was unfortunately chosen for a specific name, being afterwards necessarily changed, when the character proved common to almost every species of those now numerous genera.

OBLIQUE *Line*, a line which, falling on another, makes an oblique angle.

A line falling obliquely on another makes the angle on one side obtuse, and that on the other acute.

OBLIQUE *Percussion*, is that wherein the direction of the striking body is not perpendicular to the body struck, or is not in a line with its centre of gravity. See PERCUSSION.

The ratio an oblique stroke bears to a perpendicular one, is demonstrated to be as the sine of the angle of incidence to the radius.

OBLIQUE *Planes*, in *Dialling*, are such as recline from the zenith, or incline towards the horizon.

The obliquity, or quantity of this inclination, or reclination, is easily found by a quadrant; it being an arc of some azimuth, or vertical circle, intercepted between the vertex of the place and of that plane. This azimuth, or vertical circle, is always perpendicular to the plane. See DIALLING.

OBLIQUE *Powers* or *Forces*. See MOTION, DIRECTION, &c.

OBLIQUE *Projection*, in *Mechanics*, is that where a body is impelled in a line of direction, which make an oblique angle with the horizontal line. See PROJECTION.

OBLIQUE *Sailing*, in *Navigation*, is when the ship, being in some intermediate rhumb between the four cardinal points, makes an oblique angle with the meridian, and continually changes both its latitude and longitude.

Oblique sailing is of three kinds; viz. *plain sailing*, *Mercator's sailing*, and *great circle sailing*. See SAILING.

The seamen also call the application of the method of calculating the parts of oblique plain triangles, in order to find the distance of a ship from any cape, head-land, &c. by the name of oblique sailing.

OBLIQUE *Sphere*, in *Geography*, is that whose horizon cuts the equator obliquely; and one of whose poles is raised above the horizon, by an elevation equal to the latitude of the place.

It is this obliquity that occasions the inequality of days and nights.

Those who live under an oblique sphere (as we, and all those in the temperate zone, do) never have their days and equal, except in the equinoxes.

OBLIQUE *Ascension*, in *Astronomy*. See ASCENSION.

OBLIQUE *Descension*. See DESCENSION.

To find the oblique ascension and descension by the globe, see GLOBE.

OBLIQUE *Cases*, in *Grammar*, are all the cases of the declensions of nouns, besides the nominative. See CASE.

OBLIQUE *Distillery*, in *Chemistry*. See DISTILLATION.

OBLIQUE *Flanks*, in *Fortification*. See FLANK.

OBLIQUITY, that which denotes a thing *oblique*.

The obliquity of the sphere is the cause of the inequality of the seasons of nights and days.

OBLIQUITY *of the Ecliptic*, is the angle which the ecliptic makes with the equator. See ECLIPTIC.

OBLIQUO, in the *Italian Music*, signifies two breves tied together, which make but one body, whence it is named in Italian *nota d'un corpo solo*; sometimes there is a tail, on the right or left side, either ascending or descending. (See NOTE and LIGATURE.) However it be, the two extremes mark the sound, the middle serves only to tie them, thus:

OBLIQUUS, in *Anatomy*, an epithet applied to several muscles of the human body.

The *obliqui abdominis* are two large muscles of the abdomen. As the muscles of this part are much connected together, and cannot be well understood, when described in an insulated way, we shall give an account of the whole in this article.

The sides or parietes of the abdominal cavity are composed almost entirely of muscles: the diaphragm separates it above from the chest, (see DIAPHRAGM,) and the levator ani shuts it up below (see INTESTINE). At the front and sides its boundaries are formed by the *abdominal* muscles properly so called, which fill up all the space between the inferior aperture of the chest and the superior margin of the pelvis. The contractions of these muscles change the dimensions and form of the abdomen, move the viscera in different directions, and execute many of the movements of the trunk. The details concerning these points will be found in the present article, in those just referred to, and in the article LUNGS.

The abdominal muscles are five on each side of the body: three of these are very broad, and placed in succession, one within the other, at the side of the abdomen. They end in front, in broad and thin aponeuroses or sheets of tendon, which occupy all the front of the trunk between the chest and pelvis. The formation of these muscles is therefore peculiar, and the peculiarity arises from their being placed on

the ſurface of a cavity, and having an expanſion in breadth neceſſary to cover that cavity. Their aponeuroſes form a firm ſupport and protection to the contained viſcera. In tracing the aponeuroſes of the three lateral muſcles from the ſide, towards the middle of the abdomen, we find them ſeparating from each other, ſo as to form a tendinous ſheath, diſpoſed lengthwiſe on the front of the abdomen, and including the rectus and pyramidalis abdominis; they then unite again, and are firmly interwoven, along the middle line of the abdomen, with thoſe of the oppoſite ſide, to form the linea alba, which is conſequently a common point of inſertion for the three broad muſcles of each ſide.

When the integuments are ſtripped from the front of the belly, the expoſed ſurface is entirely aponeurotic, between two perpendicular lines, drawn from the anterior ſuperior ſpines of the oſſa innominata to the correſponding points of the cheſt. The *linea alba* is a white depreſſed line, running perpendicularly along the middle of the belly, from the enſiform cartilage to the pubes, and ſeparating from each other the right and left recti and pyramidales. It is made up of tendinous fibres, cloſely compacted, and interwoven with each other. It is fixed above to the enſiform cartilage, below to the ſymphyſis pubis; its anterior ſurface is covered by the ſkin, the poſterior by the peritoneum. Its ſides are the points of attachment of the broad muſcles of the abdomen. A little below its middle, there is a round opening in it, called the navel or umbilicus. Through this the veſſels of the umbilical chord paſs in the fœtus, and the fibrous remains of the ſame veſſels occupy it after the chord has been ſeparated. The aperture is larger at the former period: it gradually diminiſhes in ſize after birth, and is filled by a denſe ſubſtance with the remains of the veſſels already mentioned, to which an inflected cicatrix of the ſkin firmly adheres. In umbilical ruptures the contents of the abdomen are generally protruded at this opening. The linea alba varies in breadth at different parts. At the enſiform cartilage the recti nearly touch each other: but they diverge below this point, ſo that the line is about half or three quarters of an inch broad at the navel. It again grows narrower below the navel, and is a mere line for ſome inches above the pubes.

On each ſide of the linea alba the aponeuroſis is elevated by the recti muſcles; and a ſemilunar line is deſcribed by the outer margin of each of theſe, where the aponeuroſes ſeparate, in order to include the rectus: hence ariſe the two *lineæ ſemilunares* of the abdomen, the right and left. There are three or four ſhorter lines placed tranſverſely, and croſſing from the linea alba to the ſemilunaris on each ſide: they are formed by the adheſion of the aponeuroſis to the tendinous interſections of the recti, and are ſometimes called *lineæ tranſverſæ*.

The *obliquus externus abdominis* (obliquus deſcendens, grand oblique, coſto-abdominien) is the largeſt and moſt ſuperficial of the abdominal muſcles, of inconſiderable thickneſs in compariſon to its breadth. It extends from the lower and anterior part of the cheſt to the criſta of the ilium, and to the pubes; and from the lumbar region behind to the linea alba in front. We conſider in it an external and an internal ſurface, and four edges.

The external ſurface is covered by the ſkin, except for a ſmall extent behind, where the latiſſimus dorſi lies on it: a conſiderable ſtratum of fat lies between the integuments and this muſcle. The internal ſurface covers the anterior part of the ſeven or eight lower ribs, and of their cartilages, the intercoſtal muſcles, the upper part of the rectus, the obliquus internus, the cremaſter muſcle and ſpermatic chord. A thin ſtratum of cellular tiſſue ſeparates it from the obliquus internus behind; but in front the aponeuroſes are blended into one layer in the greateſt part of their breadth.

The front edge of the aponeuroſis is attached to the linea alba in its whole length: the poſterior margin of the muſcle is extended from the cartilage of the laſt falſe rib to the criſta ilii, and is unattached: it is covered by the latiſſimus dorſi.

The ſuperior edge may be divided into two parts: the anterior, which is ſhort, extends horizontally from the ſeventh or eighth rib to the middle of the enſiform cartilage, and is covered by and connected to the pectoralis major; the poſterior is much longer, directed obliquely downwards and backwards, and commonly called the origin of the muſcle. This part is attached to the ſeven or eight lower ribs, and ſometimes only to ſix, by an equal number of angular portions, of different length and breadth, ſeparate from each other, and called digitations. The middle portions are broader and longer than the ſuperior and inferior. We may diſtinguiſh in each an upper and lower edge and a point: indeed they exactly reſemble the teeth of a ſaw on a large ſcale. The upper margin is fixed to the bony part of the rib, obliquely from above downwards, and from before backwards: and the fibres meet, in the four or five ſuperior ones, with thoſe of the lower margins of the ſerrated portions of the ſerratus magnus: the lower margin is connected by cellular tiſſue to the upper edge of thoſe ſerrated portions. The apex is generally elongated, and fixed to the under edge of the rib. The four or five ſuperior digitations of the obliquus externus are received into the intervals of the origin of the ſerratus. The three or four lower pieces are covered by the latiſſimus dorſi, and decuſſate with it. The firſt digitation is fixed near the cartilage of the rib; but the ſucceeding ones recede farther and farther from this point to the fifth; from which they again advance to the front of the ribs, ſo that the laſt ariſes from the cartilage as well as from the bone. It will follow from this deſcription that the breadth of the obliquus externus is greateſt at its middle, and that it becomes narrower from this part towards either the upper or lower edge.

The inferior margin is fixed, by fleſhy and aponeurotic fibres, to the anterior third part of the outer edge of the criſta ilii: from the ſpine of the bone it is extended, nearly in a ſtraight line, over the broad concavity in the front of the os innominatum, to the pubes, to which it is attached, and it is connected between thoſe two points to the faſcia lata of the thigh.

The muſcle is compoſed of fleſhy fibres, and an aponeuroſis; a line drawn perpendicularly from the cheſt to the anterior ſuperior ſpine of the ilium would very nearly mark the diſtinction, all in front being aponeurotic, and all behind muſcular. The latter fibres vary in length and direction; the upper ones are the ſhorteſt, and nearly horizontal, they grow longer to the middle, and paſs from above forwards and downwards: the lower ones become again ſhorter, and their direction is nearly vertical. The two inferior digitations end in the criſta ilii; but all the reſt terminate in the aponeuroſis.

The latter is broader below than above; it is thin, but ſtrong, and made up chiefly of oblique fibres, following the ſame direction as thoſe of the muſcular part: ſome weaker fibres occaſionally croſs theſe. Irregular openings in it ſerve to tranſmit ſmall nerves and blood-veſſels. That part of the aponeuroſis, which is ſtretched from the ilium to the pubes, is thicker and ſtronger than the reſt, and is deſcribed, as if it were a diſtinct part, under the name of Fallopius's or Poupart's ligament, or the crural arch. By the attachment of the faſcia lata it is firmly braced

braced down on the ſubjacent organs, and it is rendered a litle convex towards the thigh. When the limb is extended and rolled outwards, the aponeuroſis is drawn as much as poſſible downwards, and rendered tenſe: by bending and rotating the thigh inwards, it is relaxed. Through the ſpace under the crural arch, the pſoas magnus and iliacus internus, the anterior crural nerve, the femoral artery and vein, and the great abſorbent trunks of the lower limb, paſs. For a more particular account of the crural arch, ſee the article HERNIA, under the diviſion *Crural hernia:* and for the attachment of the faſcia lata to it, ſee FASCIA.

When the aponeuroſis approaches the pubes, it ſeparates into two portions, which conſtitute the pillars or columns of the abdominal ring. The upper or inner of theſe is fixed to the ſymphyſis pubis, decuſſating with the correſponding one of the oppoſite ſide: the lower or outer (which is indeed the above-mentioned ligament of Poupart, or the crural arch) is attached to the ſpine and criſta of the bone. The ſeparation of theſe tendinous columns leaves a triangular ſpace, called the abdominal ring, or ring of the external oblique muſcle. The pubes conſtitutes the baſe of the triangle, the two pillars form its ſides; and the apex is the part at which theſe ſeparate from each other. It is not however pointed; ſince ſome tranſverſe fibres, which connect the two columns together, round off this upper part of the opening. The abdominal ring is directed obliquely upwards and outwards; the upper part of it pointing towards the ſpine of the ilium: this part is often mentioned under the name of the external angle of the ring. The baſe of the triangle is ſituated downwards and inwards, with reſpect to the apex; and the two ſides, of which one is external and the other internal, are continued from the apex obliquely downwards and inwards to the baſis.

The ſpermatic chord and round ligament of the uterus, and the contents of inguinal hernia or bubonocele, paſs through this opening.

The *obliquus internus abdominis* (obliquus aſcendens, petit oblique, ileo-abdominien) is ſmaller than the former, under which it is placed at the lateral and anterior part of the belly. It extends from above downwards from the lower edge of the cheſt to the upper margin of the pelvis; and from before backwards from the vertebral column to the linea alba. It is broad and thin, and much narrower behind than in front.

The external ſurface is covered behind by the latiſſimus dorſi, and in the reſt of its extent by the obliquus externus. Its internal ſurface lies on the common maſs of the ſacro-lumbalis and longiſſimus dorſi, on the tranſverſus, and the rectus.

The inferior edge of this muſcle, or its origin, is fixed to the anterior three-fourths of the criſta ilii, between the obliquus externus and the tranſverſus, and to the outer half of the poſterior ſurface of the crural arch, by fleſhy fibres. From the latter it is extended, behind the ring of the obliquus externus to the pubes, to which it is attached. Between the latter bone and the crural arch the edge of the muſcle is unattached; the ſpermatic chord paſſes under it, and receives a thin faſciculus of fibres from it, conſtituting the *cremaſter* muſcle, which ſee. In the female the round ligament of the uterus takes the ſame courſe.

The back edge is connected by an aponeuroſis, common to it with the ſerratus poſticus inferior and latiſſimus dorſi, to the ſpines of the lumbar vertebræ and ſacrum. The upper margin is attached by fleſhy fibres to the cartilages of the four lower falſe ribs, and is continuous, at the two laſt intercoſtal intervals, with the internal intercoſtal muſcles. At the edge of the rectus it becomes aponeurotic, and divides into two layers; an interior going in front of that muſcle, and united to the aponeuroſis of the obliquus externus; and a poſterior paſſing behind it, fixed to the cartilage of the firſt falſe, and the laſt true rib, as high as the enſiform appendix, and confounded with the aponeuroſis of the tranſverſus. The front edge of the muſcle is fixed to the whole length of the linea alba.

The obliquus internus is compoſed of a poſterior and an anterior aponeuroſis, and of muſcular fibres between theſe. The former is attached to the back of the criſta ilii, and to the ſpines of the ſacrum and lumbar vertebræ. The muſcular fibres ariſe from the poſterior aponeuroſis, from the criſta ilii, and from the crural arch, and are, for the moſt part, directed obliquely upwards and forwards; the lower ones however approach to the horizontal direction, and the very loweſt go a little downwards. They all end in front in a broad aponeuroſis, which commences farther forward on the abdomen than that of the obliquus externus. This aponeuroſis, at firſt ſimple, divides at the edge of the rectus into two layers, an anterior, which becomes inſeparably connected to that of the obliquus externus; and a poſterior, joined in the ſame way to the aponeuroſis of the tranſverſus. The rectus is interpoſed between theſe, both of which end at the linea alba. The lower fourth part of the aponeuroſis goes entirely in front of the rectus; and its inferior end is fixed to the pubes.

*Tranſverſus abdominis*, (tranſverſalis, lombo-abdominien.) This, like the preceding, is a very broad and thin muſcle, much broader before than behind, placed under the two obliqui, at the ſide and back of the abdomen, extending from the lower edge of the cheſt to the upper edge of the pelvis, and from the lumbar vertebræ to the linea alba. Externally it is covered, in nearly its whole extent, by the obliquus internus; the common maſs of the ſacro-lumbalis and longiſſimus dorſi, the ſerratus inferior poſticus, and the latiſſimus dorſi, cover a ſmall part of it behind. The internal ſurface is in contact with the peritoneum, with the faſcia tranſverſalis, and, for a ſmall ſpace, with the front of the rectus, and of the pyramidalis. The ſuperior edge is fixed, by ſeparate fleſhy attachments, to the internal ſurface of the cartilages of the 6th and 7th true, and of all the falſe ribs; theſe meet, on the cartilages, with the origins of the diaphragm. It is continuous above with the triangularis ſterni. The poſterior edge is attached to the tranſverſe and ſpinous proceſſes of the four upper lumbar vertebræ. The lower margin is fixed to the inner edge of the criſta ilii, and to the outer half of the crural arch. From the latter it is ſtretched, juſt behind the obliquus internus to the pubes; here indeed the two muſcles are generally ſo cloſely connected, that they can hardly be ſeparated without cutting through the fibres. The front edge terminates in the whole length of the linea alba. The tranſverſus is compoſed of an anterior and poſterior aponeuroſis, and of muſcular fibres between them.

The poſterior aponeuroſis conſiſts of three portions; a middle, which is thickeſt, and fixed to the tranſverſe proceſſes of the lumbar vertebræ, behind the quadratus lumborum; an anterior, which is very thin, and goes in front of the quadratus to the ſame proceſſes; and a poſterior, which joins the common aponeuroſis of the latiſſimus dorſi, ſerratus inferior, &c. The muſcular fibres are all horizontal, and parallel, excepting the inferior, which deſcend a little; they paſs from the cartilages of the ribs, from the poſterior aponeuroſis, from the criſta ilii, and from the crural arch to the anterior aponeuroſis. The middle ones are the longeſt, and the length diminiſhes from above downwards. The anterior aponeuroſis commences by a ſemilunar edge, of which

the convexity is turned outwards; it proceeds, together with the poſterior layer of the obliquus internus, behind the rectus to the linea alba; but it is ſplit tranſverſely at about the midway between the navel and pubes, and the lower part goes over the rectus to the linea alba: this is inſerted below in the pubes.

*Faſcia tranſverſalis.*—Behind the crural arch, the inferior edge of the obliquus internus and tranſverſus is placed, extending from the middle of that arch to the pubes, and covering behind a part of the ring of the external oblique. A thin faſcia, called tranſverſalis, is extended from the crural arch behind the tranſverſus muſcle, on the ſurface of which it is gradually loſt. By this the ring of the external oblique is cloſed towards the abdomen; and, but for this there would be a direct opening into the belly behind that ring; it alſo ſhuts up the ſlit under the inferior edges of the muſcles juſt mentioned. It conſiſts of a thin and delicate expanſion, yet has often a very diſtinct fibrous texture near the crural arch. If we trace it from this part upwards, we ſhall find it divided immediately into two portions, an internal and external, which have between them a conſiderable interval, juſt in the middle of the crural arch. The former of theſe is connected, by its inner edge, to the outer margin of the rectus abdominis, and to the inferior margin of the tendon of the obliquus internus and tranſverſus; and both are gradually loſt above between that muſcle and the peritoneum. The poſterior ſurface of this aponeuroſis is lined by the peritoneum.

The diviſion of the faſcia tranſverſalis into two portions would leave a wide opening above the crural arch; but the lower part of the obliquus internus and tranſverſus ſhuts up this, except in a ſmall part in the immediate neighbourhood of the arch. Through this aperture the ſpermatic veſſels, and round ligament of the uterus, eſcape from the abdomen; they then go obliquely downwards and forwards, between the faſcia and the aponeuroſis of the external oblique, and finally emerge through the opening in the tendon of the external oblique.

If, under the term abdominal ring, we include the whole paſſage through the abdominal parietes, we muſt deſcribe it as a canal, and not as a ſimple opening. The upper or inner aperture (formed by the faſcia tranſverſalis, and the lower border of the internal oblique and tranſverſus muſcles,) is rather nearer to the pubes than to the ilium; the lower or outer opening is the triangular aperture in the obliquus externus; and the canal itſelf extends obliquely between theſe points, being cloſed in front by the aponeuroſis of the external oblique, and behind by the faſcia tranſverſalis.

The *rectus abdominis* (ſterno-pubien) is a long muſcle, of a flattened figure, meaſuring about three fingers' breadths acroſs, and extending along the front of the abdomen, from the cheſt to the pelvis. Its anterior ſurface is covered above by the aponeuroſis of the obliquus externus, in the greateſt part of its extent by the anterior layer of the obliquus internus, and below by the tranſverſus and pyramidalis. The poſterior ſurface covers the cartilages of the three laſt true ribs, a ſmall part of thoſe of the two firſt falſe ribs, the enſiform cartilage, the poſterior layer of the internal oblique, the internal mammary and epigaſtric arteries, and, at the lower part, the peritoneum. Thus the rectus is incloſed in an aponeurotic ſheath, in which we diſtinguiſh two layers. The anterior is formed in its upper three-fourths by the aponeuroſis of the obliquus externus, with the anterior layer of that of the obliquus internus; and it is connected above with the pectoralis major. The inferior fourth part is formed by the aponeuroſis of the obliquus externus, with the whole of that of the internus, and tranſverſus. The poſterior layer is compoſed of the poſterior layer of the obliquus internus, and by the tranſverſus. In the lower fourth part this layer is deficient, and the muſcle reſts on the peritoneum. The anterior layer is connected to the muſcle by cellular tiſſue, except at its tendinous interſections; and the poſterior by a looſe cellular texture.

The ſuperior extremity conſiſts of three fleſhy portions attached to the cartilages of the three laſt true ribs; it deſcends along the front of the abdomen, ſeparated from the oppoſite muſcle only by the linea alba. It preſerves its original breadth through the upper three-fourths of its length, then is contracted by a ſloping inwards of its outer edge, and terminates in a flattened tendon, inſerted in the upper part of the pubes behind thoſe of the three broad abdominal muſcles.

The fleſhy fibres of the rectus are interrupted on the front by tranſverſe portions of tendon, extending from one ſide to the other, called tendinous enervations or interſections, and varying from three to five. One is oppoſite to the navel, one below, and two or three above; or that below the navel may be wanting. The latter of them extends only half way acroſs. Their breadth varies, but does not exceed a quarter or half an inch; and their direction is zigzag. The front layer of the tendinous ſheath adheres ſo cloſely to theſe interſections, that it cannot be ſeparated without cutting them.

The *pyramidalis* (pubo-ombilien) is a ſmall muſcle of a triangular figure, placed at the lower and middle part of the abdomen, and extending from the pubes to the linea alba. Its baſis is placed downwards, and attached by fleſhy fibres to the upper and front part of the pubes, in front of the rectus. Its internal edge is parallel to the linea alba, to which it is attached in its upper third part, and is ſeparated by that line from the oppoſite muſcle. The outer margin is oblique from below upwards. Nearly the whole of the muſcle is fleſhy. The internal fibres are the ſhorteſt, and they gradually increaſe in length towards the outer edge. The aponeuroſis of the obliqui and tranſverſus cover it in front; and it covers behind the inferior extremity of the rectus.

The pyramidalis varies conſiderably in ſize; and ſometimes is altogether deficient; ſometimes it is found on one ſide only.

*Motions produced by the abdominal Muſcles.*—Theſe organs may be conſidered as protecting the abdominal viſcera, and as the cauſe of various movements affecting the cheſt, abdomen, and pelvis.

The firmneſs of their reſiſtance in front depends much on the broad aponeuroſes which cover this part of the abdomen; when theſe are rendered tenſe by the action of the abdominal muſcles, violent blows can be ſupported without injury; but an inconſiderable ſtroke will produce very ſerious effects when the parts are relaxed. Bichat regards the pyramidalis as a tenſor of theſe aponeuroſes. The thickneſs of the muſcles at the ſides, and the different courſe of their fibres, make them a very effectual protection for the viſcera, and the muſcles of the vertebral hollows are added behind.

If the pelvis and cheſt are fixed, the abdominal muſcles contract the cavity of the belly, and preſs on the viſcera: the tranſverſus and internal oblique have the greateſt effect in this way. The rectus and the external oblique cannot concur any further than when they repreſent ſtraight lines from the cheſt to the pelvis. The enlargement and diminution of the abdomen go on almoſt entirely in front; the belly riſes at that part in inſpiration and ſinks again in expiration. In this function all the abdominal viſcera are conſtantly changing their poſition from the action of the diaphragm and abdominal muſcles. See the deſcription of the motions of the cheſt, in the article LUNGS.

The abdominal muſcles concur further in expiration by drawing the ribs downwards; the tranſverſus approximates them horizontally. In this caſe we ſuppoſe the vertebral column to be fixed; but if the latter be moveable, the cheſt will be bent forwards upon the pelvis. This flexion is direct if the right and left recti, pyramidales, and obliqui act together (the tranſverſi have no concern in it); the trunk is bent laterally if the muſcles of one ſide act ſeparately. The obliquus externus, by drawing the ribs downwards and forwards, twiſts the trunk to the oppoſite ſide; the obliquus internus to its own ſide; the rectus and pyramidalis will alſo incline it to the ſame ſide. The ſterno-cleido-maſtoidei generally act with the recti to fix the ſternum; and the recti act with them for the ſame purpoſe; thus, if a perſon lying down attempt to raiſe his head, and bend it forwards, the recti become quite tenſe.

The abdominal muſcles will move the pelvis on the cheſt, if the latter part be fixed; and either directly, or obliquely, accordingly as thoſe of both ſides act together, or as they act ſeparately on one ſide. This effect may be obſerved in climbing, tumbling, &c.

Obliqui *Arytenoidei*, a name given to ſome ſlender muſcular fibres in the larynx. See Larynx.

Obliquus *capitis inferior* (grand oblique, atloido-axoidien). This muſcle is placed at the upper and back part of the neck, between the ſpinous proceſs of the ſecond vertebra, and the tranſverſe proceſs of the firſt; it is elongated, and nearly round, larger in its middle than at the extremities. Ariſing at the ſide of the point of the ſpinous proceſs of the vertebra dentata, below the rectus major, it goes obliquely outwards, forwards, and upwards, and is fixed to the poſterior and inferior part of the tranſverſe proceſs of the atlas. Its two extremities are more or leſs tendinous; and the reſt of the muſcle is fleſhy. Its anterior ſurface covers the ſecond vertebra of the neck, and the vertebral artery; the muſcle is covered behind by the complexus.

The obliquus inferior, by drawing the tranſverſe proceſs of the atlas to the ſpinous proceſs of the ſecond vertebra, rotates the atlas on the latter bone. In this motion the head is carried along with the atlas; and the face is turned towards the ſhoulder of that ſide, on which the muſcle reſts.

Obliquus *ſuperior capitis* (petit oblique, atloido-ſous-maſtoidien). This is a ſmall flattened muſcle, at the upper, back, and lateral part of the neck, extending from the tranſverſe proceſs of the atlas to the occiput. Its inferior extremity is fixed to the upper and back part of the apex of the tranſverſe proceſs of the atlas, in front of the preceding muſcle, to which it is united. It paſſes upwards, backwards, and a little inwards, and is fixed to the outer part of the occiput. Its extremities are tendinous, and the middle is chiefly muſcular. Its poſterior ſurface is covered by the trachelo-maſtoideus, ſplenius, and complexus; and its anterior ſurface covers the vertebral artery and the occiput. It extends the occiput on the atlas, and inclines it to one ſide.

Obliquus *oculi ſuperior*, } two muſcles of the eye. See
Obliquus *oculi inferior*, } Eye.

OBLIZESZTI, in *Geography*, a town of Walachia; 40 miles E. of Buchareſt.

OBLONG, in *Geometry*, a figure longer than it is broad. Thus a rectangled parallelogram, whoſe ſides are unequal, is an oblong: ſo an ellipſis is alſo an oblong.

OBNUNCIATION, Obnunciatio, in *Roman Antiquity*. See Nunciation.

OBOCZ, in *Geography*, a town of the duchy of Warſaw; 15 miles N.N.W. of Kaliſch.

OBODOWKA, a town and fortreſs of Poland, in the palatinate of Braclaw; 28 miles S. of Braclaw.

OBOE, Ital. a performer on the *Hautbois*; which ſee.

OBOIAN, in *Geography*, a town of Ruſſia, in the government of Kirſk; N. lat. 51° 10'. E. long. 35° 54'.

OBOISTA, Ital. a performer on the hautbois.

OBOLARIA, in *Botany*, was ſo called by Linnæus, from *obolus*, a ſmall ancient coin; this name being therefore equivalent to *Money-wort*, and applied to the preſent plant, in alluſion to the orbicular ſhape of the ſegments of its calyx. Siegeſbeck had choſen the ſame appellation for a plant with rounded leaves, now become far more famous by another name, *Linnæa*.—Linn. Gen. 321. Schreb. 421. Willd. Sp. Pl. v. 3. 346. Mart. Mill. Dict. v. 3. Juſſ. 101. Lamarck Dict. v. 4. 509.—Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Perſonatæ*, Linn. *Pediculares*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, in two deep, large, rounded ſegments. *Cor.* of one petal; tube inflated, about the length of the calyx; limb in four deep, elliptic-oblong, rather unequal, entire, ſpreading ſegments, ſomewhat ſhorter than the tube. *Stam.* Filaments four, awl-ſhaped, inſerted into the tube between the ſegments of the corolla, much ſhorter than the limb, the two neareſt rather the longeſt; anthers ſmall, roundiſh. *Piſt.* Germen ſuperior, ovate, compreſſed; ſtyle nearly cylindrical, the length of the ſtamens; ſtigma thickiſh, cloven, permanent. *Peric.* Capſule nearly ovate, compreſſed, ſomewhat tumid, of two valves oppoſite to the partition, and two cells? *Seeds* numerous, very minute.

Eſſ. Ch. Calyx in two deep rounded ſegments. Corolla four-cleft, nearly equal; tube inflated. Stamens between the ſegments of the limb. Capſule of two valves, with many ſeeds.

1. O. *virginica*. Linn. Sp. Pl. 881. (O. virginiana, radice fibroſa, ſummo caule foliis ſubrotundis; Pluk. Phyt. t. 209. f. 6. Moriſ. ſect. 12. t. 16. f. 23.)—Native of Virginia and Pennſylvania. We received very perfect ſpecimens from the Rev. Dr. Muhlenberg, which have enabled us to amend the generic character, except what regards the capſule being of one or two complete cells, a point we have not materials to determine. The plant appears to be very little known. Linnæus had no ſpecimen; Michaux paſſed it over in ſilence; nor does Juſſieu, or Lamarck, appear to have ſeen it, there being no figure of the genus in the "Illuſtrations" of the latter. Plukenet's repreſentation, copied by Moriſon, is very good. The *root* conſiſts of ſeveral thick fibres, and is probably annual and paraſitical. *Stem* ſolitary, ſimple, three or four inches high, wavy, rather angular, ſmooth. *Leaves* none, except a few pair of oppoſite, ſmall, rounded ſcales upon the ſtem. *Cluſter* terminal, ſomewhat branched, denſe. The large ſegments of the *calyx*, ſaid to be purple beneath, give it a leafy aſpect. The *corolla* much reſembles that of an *Exacum*, in the dried ſtate. Clayton deſcribes it as of a pale red, and he ſays the plant flowers in April.

OBOLATA Terræ, in our *Ancient Law Books*, is a certain quantity of land, which ſome authors fix at half an acre; though others make it but half a perch.

According to Thomaſius, the obolus terræ contains ten feet in length, and five in breadth.

OBOLLAH, in *Geography*, a town of Perſia, in the province of Irak, on the Tigris. Although this town be not large, it is ſtrong and well peopled, and its ſituation is peculiarly delightful; near Baſſora.

OBOLUS, in *Coinage*, an ancient ſilver money of Athens, the ſixth part of a *drachm*; which ſee.

The word comes from the Greek, οβολος, of οβελος, *ſpit*, or *broach*, either becauſe it bore ſuch an impreſſion, or becauſe, according to Euſtathius, it was in the form of it: but thoſe now in the cabinets of the antiquaries are round.

They alſo ſtruck ſilver pieces of one, two, three, four, and five oboli, of half, and of one-fourth of an obolus. (See DRACHM.) In Greece, they had alſo braſs and copper oboli. The braſs obolus, which was at firſt equal in ſize to the Roman ſeſtertius, or large braſs, leſſens by degrees to about the ſize of a ſilver drachma. One of the latter occurs in Geſſner, Pl xlviii. N° 19, in which is a coin of Nyſa, with an ear of wheat on one ſide, ΝΙΣΑΙΩΝ; reverſe, a youth on the prow of a ſhip, holding a coin in his hand, and οΒοΛοΣ. Although the era of the above coins cannot be preciſely aſcertained, the period of declenſion in ſize muſt have been from Auguſtus down to Gallienus: and we may ſafely ſuppoſe that the copper obolus, at firſt above the ſize of large braſs, was uſed in Greece about the time of her firſt ſubjection to Rome: accordingly Vitruvius, who lived in the time of Auguſtus, ſpeaks of copper oboli, lib. iii. c. 1. When the lepta ceaſed, the chalci came in their room, with the dichalcus, and hemiobolion of braſs. See CHALCHOS.

OBOLUS was alſo uſed, among our *Anceſtors*, for half a noble or florin; where the noble was eſteemed as the penny, and its quarter part a farthing.

In effect, in the old hiſtories and accounts of coins, we are to underſtand by the word denarius, the whole coin, be it angel, rial, &c.; by the obolus, its half; and by quadrans, its fourth part.

OBOLUS, in *Medicine*, is uſed for a weight of ten grains, or half a ſcruple.

Du Cange ſays, the obolus weighs three carats, or four grains of wheat; others divide it into ſix areolæ, and the areola into ſeven minutes; others into three ſiliquæ, each ſiliqua into four grains, and each grain into a lentil and a half.

Among the Sicilians obolus alſo denoted a weight of a pound.

OBONA, in *Geography*, a town of Spain, in Aſturia; 24 miles W. of Oviedo.

OBORKOW, a town of Poland, in the palatinate of Belcz; 12 miles N.N.W. of Belcz.

OBORNIKI, a town of the duchy of Warſaw; 20 miles from Poſen.

OBORNOI, a cape on the coaſt of Ruſſia, in the government of Archangel, in the Frozen ſea; 200 miles S.E. of Kola. N. lat. 67° 50′. E. long. 50° 34′.

OBOVATUM FOLIUM, in *Botany*. See LEAF.

OBOXINTA, in *Geography*, a town of Japan, in the iſland of Niphon; 22 miles S. of Meaco.

OBRA, a town of the duchy of Warſaw; 26 miles S. of Poſen.

OBRANG, in *Botany*, the name given by the people of Guinea to a very ſingular and remarkable plant, the virtues of which they greatly praiſe. They boil it in water, and uſe the decoction by way of fomentation, to take down ſwellings of the teſticles. Its leaves have ſome faint reſemblance to thoſe of our liquorice, whence Petiver has called it glycyrrhizæ folio ſingulari frutex Guineenſis ſpinis gemellis.

OBRAWA, or BOBROWA, in *Geography*, a town of Moravia, in the circle of Brunn; 26 miles N.W. of Brunn.

OBRECHT, ULRIC, in *Biography*, a learned philologiſt and civilian, was born in 1647 at Straſburg, where his grandfather had been profeſſor of the law. His taſte for literature and general knowledge was diſplayed at a very early period, and at the age of nineteen he printed a commentary upon the "Somnium Scipionis," and "A Diſſertation on the Principles of Wiſdom." He afterwards publiſhed "Animadverſiones in Diſſertationes de Ratione Status in Imperio," which was an anſwer to a celebrated work of that time, againſt the claims of the houſe of Auſtria. He was made profeſſor of law at Straſburg, and by his induſtry, and economy of time, he found means to compoſe various works beſides fulfilling the duties attached to his office. One of theſe was a "Prodromus Rerum Alſaticarum," being a ſketch of a great work which he meditated upon the province of Alſatia. After the capture of Straſburg by Lewis XIV., Obrecht, who had hitherto been a Lutheran, became a Catholic, and went to Paris in 1684, where he abjured Lutheraniſm before Boſſuet, who complimented him with the title of an "Epitome of all the Sciences." On his return he was appointed by the king to preſide in the ſenate of Straſburg. After this he was ſent by his majeſty to Frankfort as his commiſſioner for ſupporting the rights of the princeſs-electoral Palatine to the inheritance of her anceſtors, and he wrote an elaborate work, entitled "Excerpta Hiſtorica de Natura Succeſſionis in Monarchia Hiſpaniæ," for the purpoſe of proving the hereditary title of Philip V. to the crown of Spain. He died in the year 1705, in the 58th year of his age. Moreri.

OBRECHT. See HOBRECHT.

OBRECKHEIM, in *Geography*, a town of Germany, in the palatinate of the Rhine; 19 miles E. of Heidelberg.

OBREPTITIOUS, OBREPTITIUS, a quality of letters patent, or any other inſtrument which confers a favour, title, or conceſſion; denoting it obtained of a ſuperior by ſurprize, or by concealing from him the truth, which was neceſſary to have been expreſſed, in order to render it valid.

In which ſenſe the word ſtands oppoſed to *ſurreptitious*, where ſome falſehood has been expreſſed, in order to procure it the more eaſily. Obreption annuls the grant, wherever found.

By the canon law, a perſon demanding a benefice, without expreſſing thoſe he is already poſſeſſed of, forfeits, &c. by obreption.

OBRIEN'S BRIDGE, in *Geography*, a ſmall town of the county of Clare, Ireland, where there is a bridge over the river Shannon. Near it is Montpellier, where there is an excellent ſulphurous ſpring. This place is eight miles N.E. of Limerick.

OBRINE, *Knights of Obrine*, a military order inſtituted in the 13th century by Conrade, duke of Mazovia and Cujavia, whom ſome authors call alſo duke of Poland.

He firſt gave them the name of *Knights of Jeſus Chriſt*. Their firſt grand-maſter was Bruno. Their chief end was to defend the country from the Pruſſians, who were yet idolaters, and committed great cruelties.

Duke Conrade putting them in poſſeſſion of fort Obrine, they hence took a new name; and it was agreed between them, that whatever lands they conquered from the Pruſſians, ſhould be equally divided with him.

But the Pruſſians blocking up the fort, ſo that none of the knights could get out, the order became uſeleſs, and was ſoon ſuppreſſed. Upon this, Conrade called in the Teutonic knights.

OBRITZ, in *Geography*, a town of Auſtria, on the Taya; 6 miles W. of Sonneberg.

OBRIZUM, in *Antiquity*, a kind of gold. Pliny ſays, that they call the gold that has been ſeveral times purified in the fire, *obrizum*. "Auri experimento ignis eſt ut ſimili colore rubeat quo ignis; atque ipſum *obrizum* vocant."

*Abriz* in Arabic, or Perſian, ſignifies fine gold without mixture, which the Greeks and Latins call *obrizum.*

OBSANG, in *Geography*, a town of Germany, in the principality of Culmbach; 9 miles N.W. of Bayreuth.

OBSCURA, CAMERA. See CAMERA *Obſcura.*

OBSCURA *Clara.* See CLAIR-OBSCURE.

OBSCURE, ſomething that is dark, or that only receives and returns a little light.

OBSCURE is alſo uſed, in a figurative ſenſe, for a thing that is not clear, expreſs, and intelligible; that one does not fully apprehend; or that may be conſtrued into divers ſenſes.

OBSCURE *Notion*, or *Idea.* See NOTION, or IDEA.

OBSCURE, *Clair.* See CLAIR-OBSCURE.

OBSCURITY, that which denominates a thing obſcure.

Obſcurity is a fault that may either be in the perception, or the diction.

*Obſcurity in the perception* ariſes chiefly hence, that we do not conceive things as they are, or as we find them; but as we judge them to be before we know them: ſo that our judgment precedes our knowledge, and is made the rule or ſtandard of our conceptions. Whereas nature and reaſon direct, that things ſhould be judged of according as they are known; and that they are to be known, not as they are in themſelves, but only in ſuch manner as God was pleaſed to have them known.

*Obſcurity in the diction* may ariſe, firſt, from the ambiguity of the ſenſe of words; ſecondly, from the figures or ornaments of rhetoric; thirdly, from the novelty or obſoleteneſs of the words.

OBSECRATION, OBSECRATIO, in *Rhetoric*, a figure by which the orator implores the aſſiſtance of God, or man. This figure Cicero makes admirable uſe of, for K. Deiotarus, to Cæſar. "Per dexteram te iſtam oro, quam regi Deiotaro hoſpes hoſpiti porrexiſti: iſtam, inquam, dexteram non tam in bellis & in præliis, quam in promiſſis & fide firmiorem." Thus Virgil:

> "Quod te per cœli jucundum lumen, & auras,
> Per genitorem oro, per ſpem ſurgentis Iuli,
> Eripe me his, invicte, malis"———

OBSEQUENS, JULIUS, in *Biography*, a Latin writer, who is ſuppoſed to have flouriſhed in the reign of Honorius, and wrote a book entitled "De Prodigiis;" from the ſubject of which he is conjectured to have been a heathen. It contains an account of the prodigies occurring in the Roman hiſtory, ſuch as thoſe narrated by Livy, whoſe very words he frequently borrows. Notwithſtanding its trifling and deluſive ſubject it has been frequently reprinted. The earlier part of the work is loſt, which was ſupplied, in a ſupplement, by Conrad Lycoſthenes, a corrector of the preſs at Baſil. The ſupplementary articles were diſtinguiſhed by different characters in the edition of Scheffer, 1679; the ſubſequent editions are thoſe of Hearne, 1703; Oudendorp, 1720; and of Kappius and Erhard in 1772.

OBSEQUIES, funeral ſolemnities, or ceremonies performed at the burials of eminent perſonages.

The word is derived from the Latin *obſequium, obedience;* theſe obſequies being the laſt devoirs we can render to the deceaſed. See BURIAL and FUNERAL.

OBSERVANCE literally denotes the act of obſerving, or complying with, a rule, law, or ceremony.

Hence obſervance is ſometimes alſo uſed for a rule, ſtatute, or ordinance to be obſerved.

OBSERVANCE, *Obſervantia*, is particularly underſtood, in a monaſtic ſenſe, of a community of religious, who are bound to the perpetual obſervation of the ſame rule. In which ſenſe the word coincides with *congregation* or *order.*

The Cordeliers denominated themſelves, *Religious of the Obſervance;* the *great*, and the *leſſer obſervance.* See CORDELIERS.

Thoſe Franciſcans are called *Brethren of the Obſervance*, who religiouſly obſerve the primitive laws and inſtitution of their founder, in oppoſition to *Conventuals;* which ſee. See alſo FRIARS *Obſervant.*

Among the Bernardines, there are monks of the *ſtrict obſervance*, who eat nothing but fiſh.

OBSERVANTINES, religious Cordeliers of the obſervance. In Spain there are bareſooted Obſervantines.

OBSERVATION, in the *Sea Language*, the taking of the ſun's, or any ſtar's, meridian altitude, in order thereby to find the latitude.

For the method of making an obſervation, ſee LATITUDE and LONGITUDE.

The finding of a latitude from the meridian altitude obſerved, they call *working an obſervation.*

OBSERVATIONS, in *Aſtronomy.* See CHRONOMETER, CIRCLE, CŒLESTIAL *Obſervations*, LUNAR *Obſervations*, &c.

OBSERVATORY, a building furniſhed with inſtruments for obſerving the heavenly bodies. It is generally defined, "a building in the form of a tower, erected on an eminence, and covered with a terrace, for making aſtronomical obſervations." But this deſcription, though it may apply to ancient obſervatories, does not agree with modern practice, where firmneſs of foundation, and a convenient diſpoſition of inſtruments, are conſidered of more importance than any particular form of ſtructure, or eminence of ſituation.

*Fixed* obſervatories are thoſe where inſtruments are fixed in the meridian, by which, with the aid of aſtronomical clocks, the right aſcenſions and declinations of the heavenly bodies are determined, and motion, time, and ſpace made to meaſure each other. Such buildings and apparatus only are called *regular* obſervatories, although very uſeful operations are ſometimes performed, and important diſcoveries made, where there are no inſtruments fixed in the meridian.

As navigation eſſentially depends on the determinations made in obſervatories, ſuch eſtabliſhments have been conſidered of great national importance, eſpecially in maritime ſtates; and hence they have been liberally endowed by different governments. Even private obſervatories have been, in many places, erected at a conſiderable expence, and their number has been greatly increaſed of late years; a circumſtance which, while it marks the progreſs of ſcience, does honour to the age in which we live.

Beſides the important advantages of improving nautical aſtronomy, obſervatories are, in themſelves, objects of the higheſt intereſt to every ſcientific and liberal mind. Here the inventions and diſcoveries of the greateſt men in all ages are united, and applied to the moſt grand and uſeful purpoſes. Here theory is reduced to practice, and ſcience illuſtrated by art; or, in the words of the poet, (applied to an obſervatory,)

> "Here truths ſublime and ſacred ſcience charm,
> Creative arts new faculties ſupply,
> Mechanic powers give more than giant's arm,
> And piercing optics more than eagle's eye:
> Eyes that explore creation's wond'rous laws,
> And teach us to adore the great deſigning Cauſe."

In ſhort, an obſervatory may be conſidered as affording the moſt ſublime diſplay of the works of God and man.

Impreſſed with the importance of this ſubject, we ſhall here endeavour to give a more full account of obſervatories than has been hitherto attempted in works of this kind.

*Hiſtory of Obſervatories.*—All nations where aſtronomy has been ſtudied or improved, boaſt of having had obſervatories at an early period, although ancient hiſtory affords but little information on the ſubject. It was not, indeed, until conſiderable progreſs had been made both in aſtronomy and the mechanical arts, that any attempts ſucceeded either in conſtructing inſtruments, or erecting edifices for aſtronomical purpoſes.

"The firſt obſervatories of man," ſays the eloquent Bailly, "were the fields, and his eyes his inſtruments, and his progreſs with theſe aids alone was aſtoniſhing." From the ſame intereſting writer, as well as from other good authorities, we learn that the inſtruments of ancient aſtronomers were very large and of rude conſtruction, moſtly of wood, and ſome of ſtone. They conſiſted chiefly of gnomons, dials, and aſtrolabes; and long tubes were uſed in the way of teleſcopes. Deep wells were alſo ſunk in dry places, from the bottom of which the ſtars might be ſeen in the day-time. Moſt buildings for aſtronomical obſervations were of great altitude, and were chiefly erected in very high ſituations.

In Chaldæa, a country celebrated in the early annals of aſtronomy, the lofty temple of Belus was uſed as an obſervatory; and in Egypt, the famous tomb of Oſymandias was applied to the ſame purpoſe. This building is ſaid to have contained a golden circle for celeſtial obſervations, which was 365 cubits in circumference, and one cubit in thickneſs. Little credit, however, can be given to ſuch extravagant deſcriptions.

The pyramids of Egypt are, by ſome writers, ſuppoſed to have been originally obſervatories, and in ſupport of this opinion it is argued, that they were built to face the four cardinal points. But this practice was very general in ancient times, even in the conſtruction of dwelling-houſes, which were moſtly made to front the eaſt: and our Chriſtian churches alſo have been generally built with a ſimilar attention to the points of the compaſs. The great height of the pyramids was, however, favourable for making celeſtial obſervations, particularly for the purpoſe of aſtrology, which was a leading ſtudy in thoſe times, and which chiefly required an accurate view of the riſing and ſetting of ſtars. It is, however, certain, that practical aſtronomy was much improved in Egypt, particularly in the famous ſchool of Alexandria, where an obſervatory was built 300 years before the Chriſtian era, and continued for more than five centuries under a ſucceſſion of celebrated names, among which may be mentioned Ariſtellus, Hipparchus, Ptolemy, &c.

The Gentoo nations appear to have made a very early progreſs both in the theory and practice of aſtronomy. Theſe people have traditions and veſtiges of ancient obſervatories, upon which ingenious diſquiſitions may be found in Bailly's "Hiſtoire de l'Aſtronomie Indienne," and in the "Aſiatic Reſearches," by ſir William Jones, Meſſrs. Hunter, Bentley, Colebrooke, and others. We ſhall, however, no longer dwell upon conjectures concerning antiquity, but ſhall give an account of obſervatories of more modern date in India; from the ſtructure and apparatus of which, an idea may be formed of their antecedent eſtabliſhments of the kind, as they differ, in almoſt every particular, from European obſervatories.

Theſe Hindu inſtitutions, five in number, were conſtructed nearly at the ſame period, about 200 years ago. They were built by order of the emperor Mahommed Shah, with a view to reform the calendar by means of aſtronomical obſervations; and he choſe for his principal aſtronomer Jeyſing, or Jayaſinha, the rajah of Ambhere. Theſe obſervatories were built at Delhi, Benares, Matra, Oujein, and Suvai Jeypoor, and all under the direction of Jeyſing. The obſervatory at Benares has been minutely deſcribed by ſir Robert Barker in the Philoſophical Tranſactions for 1777, in which he has given ſeveral plates both of the buildings and inſtruments: and as all the other obſervatories were built and furniſhed nearly on the ſame plan, his deſcription may be deemed here ſufficient for the whole, and we therefore make the longer extract from it.

*Benares Obſervatory.*—"We entered this building," ſays ſir Robert Barker, "and went up a ſtair-caſe to the top of a part of it, near the river Ganges, that led to a large terrace, where, to my ſurpriſe and ſatisfaction, I ſaw a number of inſtruments yet remaining, in the beſt preſervation, ſtupendouſly large, immoveable from the ſpot, and built of ſtone, ſome of them being upwards of 20 feet in height; and though they are ſaid to have been erected 200 years before, the graduations and diviſions on the ſeveral arcs appeared as well cut, and as accurately divided, as if they had been the performance of a modern artiſt. The execution in the conſtruction of theſe inſtruments exhibited a mathematical exactneſs in the fixing, bearing, and fitting of the ſeveral parts, in the neceſſary and ſufficient ſupports to the very large ſtones that compoſe them, and in joining and faſtening them into each other by means of lead and iron cramps.

"The ſituation of the two large quadrants whoſe radius is nine feet two inches, by being at right angles with a gnomon at 25 degrees elevation, are thrown into ſuch an oblique ſituation, as to render them the moſt difficult, not only to conſtruct of ſuch a magnitude, but to ſecure in the poſition for ſo long a period, and affords a ſtriking inſtance of the ability of the architect in their conſtruction; for, by the ſhadow of the gnomon thrown on the quadrants, they do not appear to have altered in the leaſt from their original poſition; and ſo true is the line of the gnomon, that, by applying the eye to a ſmall iron ring of an inch diameter at one end, the ſight is carried through three others of the ſame dimenſion to the extremity at the other end, diſtant 38 feet 8 inches, without obſtruction, ſuch is the firmneſs and art with which this inſtrument has been executed. This performance is the more extraordinary when compared with the works of the artificers of Hindooſtan at this day, who are not under the immediate direction of an European mechanic; but arts appear to have declined equally with ſcience in the eaſt.

"Lieut. Col. Arch. Campbell, at that time chief engineer in the Eaſt India company's ſervice at Bengal, a gentleman whoſe abilities do honour to his profeſſion, made a perſpective drawing of the whole apparatus that could be brought within his eye at one view; but I lament he could not repreſent ſome very large quadrants, whoſe radii were about twenty feet, being on the ſide whence he took his drawing. Their deſcription however is, that they are exact quarters of circles of different radii, the largeſt of which I judged to be twenty feet, conſtructed very exactly on the ſides of ſtone walls built perpendicular, and ſituated, I ſuppoſe, in the meridian of the place: a braſs pin is fixed at the centre or angle of the quadrant, from which the Bramin informed me they ſtretched a wire to the circumference when an obſervation was to be made; from which it occurred to me the obſerver muſt have moved his eye up or down the circumference, by means of a ladder or ſome ſuch contrivance, to raiſe and lower himſelf, till he had diſcovered the altitude

of

of any of the heavenly bodies in their paſſage over the meridian, ſo expreſſed on the arcs of theſe quadrants: theſe arcs were very exactly divided into nine large ſections; each of theſe again into ten, making ninety leſſer diviſions or degrees; and thoſe alſo into twenty, expreſſing three minutes each, of about $\frac{2}{3}$ths of an inch aſunder; ſo that it is probable, they had ſome method of dividing even theſe into more minute diviſions, at the time of obſervation.

"My time would only permit me to take down the particular dimenſions of the moſt capital inſtrument, or the greater equinoctial ſun-dial, which appears to be an inſtrument to expreſs ſolar time by the ſhadow of a gnomon on two quadrants, one ſituated to the eaſt, and the other to the weſt of it; and indeed the chief part of their inſtruments at this place appear to be conſtructed for the ſame purpoſe, except the quadrants, and a braſs inſtrument deſcribed hereafter. There is another inſtrument for the purpoſe of determining the exact hour of the day by the ſhadow of a gnomon, which ſtands perpendicular to, and in the centre of a flat circular ſtone, ſupported in an oblique ſituation by means of four upright ſtones and a croſs piece; ſo that the ſhadow of the gnomon, which is a perpendicular iron rod, is thrown on the diviſions of the circle deſcribed on the face of the flat circular ſtone. There is alſo a braſs circle, about two feet diameter, moving vertically on two pivots between two ſtone pillars, having an index or hand turning round horizontally on the centre of this circle. This inſtrument appears to be made for taking the angle of a ſtar at ſetting or riſing, or for taking the azimuth or amplitude of the ſun at riſing or ſetting.

"The uſe of another inſtrument I was at a loſs to gueſs. It conſiſts of two circular walls; the outer of which is about forty feet in diameter, and eight feet high; the wall within about half that height, and appears intended for a place to ſtand in to obſerve the diviſions on the upper circle of the outer wall, rather than for any other purpoſe; and yet both circles are divided into 360 degrees, each degree being ſubdivided into 20 ſmall diviſions, the ſame as the quadrants. There is a door-way to paſs into the inner circle, and a pillar in the centre of the ſame height with the lower circle, having a hole in it, being the centre of both circles, and ſeems to be a ſocket for an iron rod to be placed perpendicularly in it. The diviſions on theſe, as well as all the other inſtruments, will bear a nice examination with a pair of compaſſes. There is alſo a ſmaller equinoctial ſun-dial, conſtructed on the ſame principle as the large one.

"This obſervatory at Benares is ſaid to have been built by the order of the emperor Ackbar; for as this wiſe prince endeavoured to improve the arts, ſo he wiſhed alſo to recover the ſciences of Hindooſtan, and, therefore, directed that three ſuch places ſhould be erected; one at Delhi, another at Agra, and the third at Benares. Some doubts have ariſen with regard to the certainty of the ancient Bramins having a knowledge in aſtronomy, and whether the Perſians might not have introduced it into Hindooſtan when conquered by that people: but theſe doubts, I think, muſt vaniſh, when we know that the preſent Bramins pronounce, from the records and tables which have been handed to them by their forefathers, the approach of the eclipſes of the ſun and moon, and regularly as they advance give timely information to the emperor and the princes in whoſe dominions they reſided." Philoſophical Tranſactions, vol. lxvii. p. 598, or Abridgment, vol. xiv. p. 214.

The foregoing account of the Benares obſervatory has been further illuſtrated by William Hunter, eſq. in a very elaborate article in the Aſiatic Reſearches, vol. v. p. 177. in which he gives a full and particular deſcription of the other four Hindu obſervatories, and refers occaſionally to ſir Robert Barker's deſcription and plates.

Mr. Hunter's article begins with an account of the origin of thoſe obſervatories, and he gives a tranſcript of Jeyſing's preface to his aſtronomical computations in the original language, with a literal tranſlation. This preface contains an account of the aſtronomer's labours and plans, and alſo of his conference with the emperor on the ſubject of building the obſervatories. As the paper is extremely intereſting and curious, and alſo connected with our ſubject, we ſhall extract a few paſſages from it.

"Let us," ſays Jeyſing, "devote ourſelves to the altar of the king of kings; hallowed be his name in the book of the regiſter, of whoſe power the lofty orbs of heaven are only a few leaves; the ſtars, and that heavenly courſer the ſun, a ſmall piece of money in the treaſury of the empire of the moſt high."

"But ſince (Jeyſing) the well-wiſher of the works of creation, and the admiring ſpectator of the theatre of infinite wiſdom and providence, from the firſt dawning of reaſon in his mind, and during its progreſs towards maturity, was entirely devoted to the ſtudy of mathematical ſcience, and the bent of his mind was conſtantly directed to the ſolution of its moſt difficult problems; by the aid of the ſupreme artificer he obtained a thorough knowledge of its principles and rules."

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"Seeing that very important affairs, both regarding religion and the adminiſtration of empire, depend upon theſe; and that in the time of the riſing and ſetting of the planets, and the ſeaſons of eclipſes of the ſun and moon, many conſiderable diſagreements of a ſimilar nature were found; he (Jeyſing) repreſented it to his majeſty of dignity and power, the ſun of the firmament of felicity and dominion, the ſplendour of the forehead of imperial magnificence, the unrivalled pearl of the ſea of ſovereignty, the incomparably brighteſt ſtar of the heaven of empire; whoſe ſtandard is the ſun; whoſe retinue the moon; whoſe lance is Mars, and his pen like Mercury, with attendants like Venus; whoſe threſhold is the ſky; whoſe ſignet is Jupiter; whoſe centinel Saturn; the emperor deſcended from a long race of kings; an Alexander in dignity; the ſhadow of God; the victorious king, Mahommed Shah, may he ever be triumphant in battle."

"His majeſty was pleaſed to reply, 'Since you, who are learned in the myſteries of ſcience, have a perfect knowledge of this matter; having aſſembled the aſtronomers and geometricians of the faith of Iſlam and the Bramins and Pandits, and the aſtronomers of Europe, and having prepared all the apparatus of an obſervatory, do you ſo labour for the aſcertaining of the point in queſtion, that the diſagreement between the calculated times of thoſe phenomena, and the times in which they are obſerved to happen, may be rectified.'

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"Although this was a mighty taſk, which, during a long period of time, none of the powerful rajahs had proſecuted; nor, among the tribes of Iſlam, ſince the time of the martyr prince, whoſe ſins are forgiven, Mirza Uluga Beg to the preſent, which comprehends a period of more than 300 years, had any one of the kings, poſſeſſed of power and dignity, turned his attention to this object; yet, to accompliſh the exalted command which he had received, he (Jeyſing) bound the girdle of reſolution about the loins of his ſoul, and conſtructed here (at Delhi) ſeveral of the inſtruments

ſtruments of an obſervatory, ſuch as had been formerly erected at Samarcand, agreeably to the Muſſulman books.

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"Thus an accurate method of conſtructing an obſervatory was eſtabliſhed; and the difference which had exiſted between the computed and obſerved places of the fixed ſtars and planets, by means of obſerving their mean motions and aberrations with ſuch inſtruments, was removed. And in order to confirm the truth of theſe obſervations, he conſtructed inſtruments of the ſame kind in Suvai Jeypour, and Matra, and Benares, and Oujein. When he compared theſe obſervatories, after allowing for the difference of longitude between the places where they ſtood, the obſervations and calculations agreed. Hence he determined to erect ſimilar obſervatories in other large cities, that ſo every perſon who is devoted to theſe ſtudies, whenever he wiſhes to aſcertain the place of a ſtar, or the relative ſituation of one ſtar to another, might by theſe inſtruments obſerve the phenomena."

From the foregoing extract of the Aſiatic Reſearches it appears, that although ſir Robert Barker's deſcription of Benares obſervatory is allowed to be very correct, yet he was not well informed as to the ſituation or number of the other obſervatories, or the names of their founders.

At Pekin, in China, there was an imperial obſervatory built in the thirteenth century, on the city walls; and in 1669, father Verbieſt, a miſſionary Jeſuit, having been made preſident of the tribunal of mathematics there, and chief obſerver, obtained permiſſion from the emperor Cam-hi to furniſh it with new inſtruments, a catalogue of which may be ſeen in Duhalde's Deſcription of China.

Other obſervatories were built in China ſubſequently by the French miſſionaries, and by the Portugueſe Jeſuits, who diſtinguiſhed themſelves very much by their improvements in aſtronomy, notwithſtanding the duties of a very different nature in which they were employed, and to which they are ſuppoſed likewiſe to have paid due attention. The inſtruments of the Pekin obſervatory are deſcribed as exceedingly large, but the diviſions leſs accurate, and the contrivance in ſome reſpects leſs commodious than the inſtruments made at that period in Europe. The chief were, a ſextant eight feet radius, a quadrant ſix feet radius, an azimuthal horizon, alſo a celeſtial globe, an armillary zodiacal ſphere, each ſix Paris feet diameter, (the French toiſe which equals 6 feet 4¾ inches nearly Engliſh meaſure).

It is ſaid that Copernicus, in 1540, was the firſt European who ſet an inſtrument in the meridian, but it is ſtated by Weidler, Bailly, and Coſtard, that the firſt regular obſervatory in Europe was erected at Caſſel in 1561, by William I., landgrave of Heſſe, who furniſhed it with the beſt inſtruments the age could afford. He is ſaid to have made very accurate obſervations in concert with his friend and correſpondent, Tycho Brahe, who was at the above period riſing into great fame, and the high expectations formed of him were fully anſwered.

The next obſervatory in Europe that deſerves particular notice, was that of Tycho Brahe himſelf, which owed its origin, according to Bailly, to a very extraordinary cauſe. This was the appearance of a new ſtar of the firſt magnitude, in the conſtellation of Caſſiopeia. It was ſeen by different aſtronomers about the 10th of November, 1572, and as ſome of them had been before in the habit of obſerving that conſtellation, the appearance was ſuppoſed to be inſtantaneous, which added to the unuſual aſtoniſhment and conſternation that univerſally prevailed on the occaſion. It was brighter than Jupiter or Venus when neareſt to the earth, and was viſible to the naked eye at noon day. After a ſhort time it gradually declined, and in ſixteen months totally diſappeared. Many curious and alarming predictions were the conſequence, and Tycho Brahe, who obſerved it from the beginning, was ſo impreſſed with the phenomenon, that he formed a reſolution of making a new and accurate catalogue of all the ſtars, as there had been nothing of the kind regularly performed ſince the days of Hipparchus, who, it is remarkable, had been ſtimulated to the undertaking by a ſimilar cauſe, that is, by the ſudden appearance and diſappearance of a new ſtar. Tycho Brahe communicated his deſign to ſeveral eminent men, who encouraged the plan. He firſt propoſed to ſettle at Baſle, which afforded at once a pure atmoſphere, and a ready communication with the learned men of Germany, Italy, and France; but the landgrave of Heſſe wrote to Frederic II., king of Denmark, intreating him to encourage the aſtronomer to remain in his own country. The king, fully ſenſible of the loſs with which he was threatened, offered him the ſmall but fertile iſland called Huen, or Hwen, in the Sound, as a deſirable ſituation for an obſervatory. His majeſty conferred on him alſo other princely grants and immunities, which were accepted. He beſides undertook to defray the expence of building and furniſhing the obſervatory there, without any limitation of expence, a munificence which has immortalized his name. The firſt ſtone of the obſervatory was laid the 8th of Auguſt, 1576, and the place was called Uranibourg, or the Heavenly city. It was a building of 60 feet ſquare, and 70 feet high, with four towers, all contrived for aſtronomical purpoſes. It was furniſhed with a noble collection of inſtruments, many of which had been invented and brought to perfection by the aſtronomer himſelf. He had numerous aſſiſtants, whom he ſupported and inſtructed. (For his aſtronomical obſervations there, ſee the life of Brahe, Tycho.) Among his inſtruments was a celeſtial globe, of ſix feet diameter, which is ſaid to have coſt above 1000*l.* It was after his death carried to Prague, next to Neis, and laſtly to Copenhagen, where it was burnt in the great conflagration which happened there in 1728. Many of the inſtruments of this great aſtronomer were long preſerved, but have been gradually loſt, and his favourite city Uranibourg, which, in his time, was viſited by kings and princes, who paid him the higheſt honours, has been long a heap of ruins, but is ſtill viſited by the learned, and regarded with pious veneration. It ſhould have been mentioned that his celebrated ſextant has been conſecrated in the heavens as a conſtellation, under the breaſt of the lion. On large globes and atlaſes it is marked *Sextans Uraniæ*, but on common ones only *Sextans*.

We ſhall now proceed to give ſome deſcription of obſervatories of a more modern date, beginning with thoſe of France.

*French Obſervatories.*—The Imperial obſervatory (formerly called the "Royal Obſervatory," and during the time of the republic the "Obſervatory") was built in 1667, and is ſtated by La Lande to be "the moſt ſplendid monument ever dedicated to aſtronomy." It is 160 Engliſh feet in front, and 120 in breadth, and 90 feet high. Its vaults are 90 feet deep, ſo that it is 180 feet from top to bottom. For a particular deſcription of the architecture, ſee Blondel; and for the arrangement and diſpoſition of the inſtruments, ſee Bernouilli's Lettres Aſtronomiques, alſo La Lande's Aſtronomie, and Monnier's Hiſtoire Celeſte.

Beſides the above building, new rooms have been conſtructed, cloſe by the ſide of the obſervatory, where a large tranſit inſtrument and circle, by Ramſden, have been ſet up. In 1788 new vaults were made, and alſo a ſmall obſervatory erected at the top of the building, which commands an extenſive view of the horizon, and the king (Louis XVI.) eſtabliſhed

eſtabliſhed three obſervers here, that the courſe of obſervations might as little as poſſible be interrupted.

The following account of other obſervatories at Paris, given by La Lande in 1792, is worthy of being inſerted here, as intereſting in the hiſtory of practical aſtronomy.

"The aſtronomers of the academy had beſides ſeveral private obſervatories erected in different parts of Paris, as the royal obſervatory was not ſufficient for all. That of M. le Monnier has been, from the year 1742, in the garden of the Capuchins. That of the Marine, which Joſeph de l'Iſle uſed in 1748 at the Hotel de Clugny, where I laboured during two years, is at preſent occupied by M. Meſſier. That of La Caille ſtill exiſts in the Mazarin college. I, as well as M. d'Agelet, have made ſeveral obſervations there ſince his death. That of the palace of Luxembourg is above the Port Royal. Joſeph de Liſle obſerved there, and I likewiſe occupied it for ſome time. That of M. Pingré at the abbey of St. Génévieve was built in 1756. There is one of M. Cagnoli's, rue de Richlieu, which this able aſtronomer built at his own expence in 1785, when he ſtill reſided at Paris.

"The obſervatory of the military ſchool, built for M. Jeaurat in 1768, was occupied afterwards by M. d'Agelet. The late M. Bergeret, receiver-general of finances, conſtructed in 1774, at my requeſt, a large mural quadrant of eight Engliſh feet radius, the laſt and the beſt inſtrument made by the celebrated Bird, the loſs of whoſe talents we ſtill regret. This inſtrument was obtained by the military academy, as well as an excellent tranſit inſtrument, and a parallactic teleſcope. M. d'Agelet made a great number of obſervations there from 1778 to 1785, when he left it to make a voyage round the world with La Perouſe. In 1788, the changes made in the military ſchool occaſioned the demolition of this obſervatory; but it has been rebuilt, by my deſire and care, a little more to the weſt, with all neceſſary attention and expence, ſo that it is the moſt complete obſervatory we have at Paris. Having received the direction of it, I began, in 1789, to make the following obſervations. M. le François La Lande, my relation and pupil, who is a very good aſtronomer, has alſo made a prodigious number of obſervations, and we obſerved, in 1791, more than ten thouſand northern ſtars, with excellent inſtruments. This work was very much wanted, and I conſider it as one of the moſt important and difficult things that could be undertaken for aſtronomy.

"An obſervatory was built in 1775, at the Royal College, for the uſe of the profeſſor of aſtronomy of this celebrated ſchool. M. Geoffroy d'Aſſy built, in 1788, an obſervatory at his houſe, rue de Paradis, and it will become one of the moſt uſeful by the zeal and intelligence of M. de Lambre, who uſes it."

Such was the ſtate of obſervatories at Paris in 1792. At preſent (1813), De Lambre is the chief of the imperial univerſity. Meſſier and Biot ſucceeded him at the Royal College, now the College de France. Burckhardt is aſtronomer at the military ſchool; Lefrançois la Lande reſides at the Place de Cambray; and Bouvard ſuperintends the imperial obſervatory, aſſiſted by Aragon.

It is worthy of notice here, that the famous mural quadrant, with which La Lande and his relation determined the poſition of a great number of ſtars, as above-mentioned, has been conſecrated in the heavens as a conſtellation, and is placed between Hercules, the Serpent, and Bootes. It is marked *Quadrans muralis*, and contains forty ſtars.

The following were the other obſervatories eſtabliſhed in different parts of France, as ſtated by La Lande.

The MARSEILLES obſervatory, which has been rendered famous by the obſervations of M. de Sylvabelle.

At TOULOUSE, the obſervatory of M. Darquier has been made ſacred by the zeal and abilities of this learned man. Obſervatories have alſo been built in the ſame city by M. Garipuy and M. Bonrepos. Here aſtronomy has been more ſucceſsfully cultivated than in any other provincial city in France. The principal obſervatory is at preſent (1813) under the ſuperintendance of M. Vidal.

At LYONS, the College obſervatory, which was built by father St. Bonnet, is a very fine edifice, on an elevated ſituation.

At DIJON, M. Necker, about the year 1780, converted the tower of the king's lodge to an obſervatory, and the abbé Bertrand has made very accurate obſervations here.

At MONTPELLIER there has long been an obſervatory erected on one of the towers of the city. M. Ratte and M. Poitevin have diſtinguiſhed themſelves here as able aſtronomers.

At BEZIÈRS, the Biſhop's tower was converted to an obſervatory, where ſome intereſting obſervations have been made by M. Bouillet, particularly on Saturn's ring.

At AVIGNON, an obſervatory was built by father Bonfa ſo early as 1683, and it has been ſince occupied by a ſucceſſion of learned eccleſiaſtics, who have diſtinguiſhed themſelves in practical aſtronomy.

At STRASBURG, Brackenhoffer, profeſſor of mathematics, had an obſervatory over the gates of the city, and he has been ſucceeded by Herzenſchneider in 1790.

At BOURDEAUX is an obſervatory 75 feet high, and 20 feet ſquare. It is ſituated in the fineſt part of Tournay, in latitude 45°, which is the middle of the temperate zone that we inhabit. Here M. Turgot procured a complete ſet of obſervations to be made on the length of a pendulum vibrating ſeconds; upon which father Boſcovich has made an intereſting memoir.

At BREST a ſmall obſervatory was built for the naval academy, and plans have been ſet on foot for erecting a more conſiderable edifice.

At ROUEN there is an obſervatory belonging to M. Bouin, in which he has made many good obſervations.

At MONTAUBAN the duc de la Chappelle founded an obſervatory, where he himſelf has made many accurate and intereſting obſervations, particularly of the tranſit of Venus over the ſun in 1769.

*German Obſervatories.*—In Germany a great number of obſervatories have been eſtabliſhed, and that country has produced alſo ſeveral very able aſtronomers.

AT BERLIN, Frederic I., king of Pruſſia, founded an obſervatory in 1711, under the direction of Leibnitz, who was preſident of the Academy of Sciences there. It is a large ſquare tower, very ſteady. Here Griſchow and Kies made various obſervations: and La Lande alſo obſerved here about the year 1752, where, he ſays, he raiſed enormous pillars, to which he attached the mural quadrants, north and ſouth. (Memoires de l'Academie, 1751 and 1752.) King Frederic II. added a very fine building to it, where the Academy of Sciences of Pruſſia has held its aſſemblies. M. Bode has been many years the aſtronomer royal here, and has diſtinguiſhed himſelf both as an accurate obſerver, and as the publiſher of the moſt complete celeſtial atlas extant, entitled "Uranographia," which is accompanied with a well arranged catalogue of the ſtars, and an intereſting hiſtory of the conſtellations.

At VIENNA, the empreſs Maria Thereſa built an obſervatory in the year 1755 for the univerſity, and furniſhed it with many ſuperb inſtruments. There is alſo one belonging to the academical college, which was built and endowed by the Jeſuits in 1735, and it is likewiſe furniſhed with very fine inſtruments, chiefly made by Engliſh artiſts,

tiſts, and a ſucceſſion of very learned men have obſerved there. The reputation of the univerſity obſervatory was maintained for many years by the abbé Maximilian Hell, who conducted the Vienna Ephemeris, and this work is now continued by M. Treiſneckir, his ſucceſſor.

At Gottingen there is an obſervatory memorable by the labours of Tobias Mayer, and by thoſe more recently of Harding, who diſcovered the planet Juno in 1804.

At Nuremberg an obſervatory was built ſo early as the year 1678, and another in 1692. M. Zimmert and M. Wuzzelbau have diſtinguiſhed themſelves here both as able authors and accurate obſervers.

At Cassel an obſervatory was built, in 1714, by Charles I., landgrave of Heſſe, heir to the territories and taſte of the celebrated William,' the early friend and fellow labourer of Tycho Brahe.

In 1740 an obſervatory was built at Grieſſen; and in 1768 at Ourtſbourg, in Franconia. In 1788 there was one built at Leipſic, on an old tower of great firmneſs. Obſervatories have been likewiſe erected and ſupported with great credit at Manheim, Cremſmunſter, Lambach, Polling, Prague, and Gratz.

At Bremen there is an obſervatory belonging to Dr. Olbers, an eminent phyſician, who has rendered his name immortal by the diſcovery of the two new planets, Pallas and Veſta. See Planet.

At Lilienthal, near Bremen, M. Schroeter, governor of the diſtrict, erected an obſervatory about the year 1786, and furniſhed it with excellent inſtruments. He is highly celebrated as an accurate and intereſting obſerver, particularly of the ſurfaces and rotations of the planets and the moon. He approaches nearer than any other aſtronomer to Dr. Herſchel in teleſcopic diſcoveries.

At Seeberg, near Gotha, a conſiderable obſervatory was built, in the year 1788, by the duke of Saxe Gotha, and he appointed M. Zach, now baron Zach, the ſuperintendant, who has highly diſtinguiſhed himſelf as a profound and accurate aſtronomer. In 1798 he was viſited by La Lande, when, according to Voiron, (Hiſtoire de l'Aſtronomie, p. 369.) all the great aſtronomers of Germany met at Gotha to ſee the patriarch of aſtronomy, and to pay him their homage. This obſervatory is reckoned one of the moſt beautiful and complete in Europe; it is ſituated on a fine elevation, about a league from the town. There is here a large tranſit, with two murals of eight feet radius, and a circle of eight feet diameter, all by Ramſden and his ſucceſſor Berge.

At Brunswick there is an obſervatory belonging to Dr. Gauſs, well known by his determinations of the orbits of the new planets, and other important labours.

In Hungary there are obſervatories at Buda, Tyrnau, and Erlau. Similar eſtabliſhments are alſo at Greiffswalde in Pomerania, and at Mittau in Courland.

In Poland there is an obſervatory at Cracow, and another at Wilna: the latter was built and richly endowed by the counteſs Puzynina, a lady of fine genius as well as liberality. It was finiſhed in 1753, and the inſtruments with which it is furniſhed were of great variety and value. In 1765 the king of Poland, by letters patent, gave it the title of Royal obſervatory, and appointed the learned jeſuit Poezobut aſtronomer royal, who, in 1788, added another obſervatory, which he furniſhed with new inſtruments, chiefly made by Ramſden.

In Sweden obſervatories have been built at Stockholm and Upſal; that at Stockholm was founded in 1746, by the Academy of Sciences. In 1753, Wargentin was appointed aſtronomer to it, and in 1783 he was ſucceeded by Nicander. This obſervatory is ſituated on a hill north of the town, and contains a good collection of inſtruments, all made by Engliſh artiſts.

The obſervatory at Upſal was built and endowed in 1739 by the king of Sweden: it was firſt ſuperintended by the celebrated Celſius, who has been followed by a ſucceſſion of able aſtronomers, particularly Hooker and Wargentin. The latter is well known as the author of the tables of Jupiter's ſatellites.

At Dantzic there was an old obſervatory, celebrated as having been uſed by Hevelius, who has given a full deſcription of it in his work, entitled "Machina Cæleſtis." A new obſervatory was alſo built in that city in the year 1778, and is at preſent ſuperintended by Dr. Wolff.

At Copenhagen the famous aſtronomical tower was finiſhed in 1656. It was built by king Chriſtian IV. at the recommendation of Longomontanus, and has been for many years under the management of Mr. Bugge, who is celebrated as a very able aſtronomer. In his collection of obſervatories, he ſtates that the kings of Denmark had eſtabliſhed obſervatories in Norway, Iceland, and Greenland.

In Holland attention was paid to practical aſtronomy while it was a maritime ſtate, but the ſcience has of late been much neglected. In 1690 an obſervatory was erected upon the college of the univerſity, and at Utrecht an ancient tower was, in 1726, converted into an obſervatory. Here the celebrated Van Muſſchenbroek obſerved for many years with great accuracy, and he was ſucceeded by M. Hennert.

In Spain obſervatories have been built at Cadiz, Madrid, Seville, and Carthagena. The obſervations made at Cadiz (at the Marine academy) by Miguel and Varilla, have been publiſhed in two volumes, which alſo contain a catalogue of the inſtruments of the obſervatory, chiefly conſtructed by French artiſts; and hence the obſervatories of Spain differ very little from thoſe of France. Of late years, however, Engliſh inſtruments have been introduced there.

At Lisbon, in 1728, king John V. had an obſervatory erected at his palace, which was well furniſhed, and accurate obſervations have been made there by the Jeſuits, who alſo erected an obſervatory at their own college of St. Anthony, where father Carbon, in 1726, made good obſervations on the ſatellites of Jupiter. See Phil. Tranſ. vol. xxxv. p. 408.

In 1787, a Royal obſervatory was conſtructed at the Chateau de St. George, in Liſbon, which was ſuperintended by M. Cuſtodio Gomez. There is alſo one at Coimbra, which contains a fine equatorial by Troughton.

At Petersburg an obſervatory was built, in 1725, by the czar Peter, who ſhewed great zeal for ſcience in general, and particularly for aſtronomy. When he was in England, ſome years before that period, he viſited the Royal Obſervatory at Greenwich, where he examined both the building and the inſtruments with very great attention. The obſervatory which he afterwards built is one of the moſt magnificent in Europe. It is 130 feet high, with three ſtories, all fit for aſtronomical purpoſes. M. de l'Iſle has made, according to La Lande, a great number of excellent obſervations here, which are preſerved in manuſcript in the Marine depot.

At Moscow an obſervatory was built a few years ago, and furniſhed with ſome excellent Engliſh inſtruments, chiefly by Cary; but it is probable that they have been deſtroyed in the late conflagration of that city.

In Italy, practical aſtronomy has been cultivated with much aſſiduity and ſucceſs during the laſt century, chiefly by eccleſiaſtics, and particularly by the Jeſuits.

At Rome, cardinal Zelada conſtructed, at his own expenſe, on the ſouthern part of the Roman college, a very fine obſervatory, with the large ſector of father Boſcovich, and other inſtruments by Ramſden and Dollond; the abbé Calandrelli obſerved here with great attention and accuracy

for many years. Other buildings of a ſimilar deſcription have been erected in different parts of Rome.

At Bologna a magnificent obſervatory was built in 1714, in the palace of the Inſtitute, by the munificence of the celebrated count Marſigli; and pope Benedict XIV. gave afterwards a large ſum of money towards the purchaſe of inſtruments. Here a ſucceſſion of able aſtronomers have obſerved, among whom may be mentioned Manfredi, Zanotti, Canterzani, &c.

At Pisa the obſervatory is in the form of a tower. It was built in 1730, at the expence of the univerſity, and ſupplied with ſuperb apparatus made by Siſſon, Short, Graham, &c. Perelli obſerved here for many years, and had for a ſucceſſor M. Slope, who publiſhed an excellent collection of obſervations in 1789.

At Milan there is an obſervatory, which is reckoned one of the moſt uſeful in Italy. It was built in 1765, at the coſt of the college of the Jeſuits, chiefly through the zeal of father Pallavicini, and under the direction of father Boſcovich, who alſo contributed liberally to the expenſe. The inſtruments have been made with great care by the principal French and Engliſh artiſts. Among the obſervers may be alſo mentioned Reggio, Oriani, and Ceſaris.

At Florence, father Ximenes erected an obſervatory at the college of Jeſuits, which contains a quadrant by Toſcanelli, larger than any other known, with which he made obſervations to prove the ſecular diminution of the obliquity of the ecliptic. At his death he bequeathed the whole to the college. In 1772 the grand duke Leopold built an obſervatory, which M. Fontana ſuperintended, and in 1786 ſeveral fine inſtruments by Ramſden were added to it.

At Turin father Beccaria erected a ſmall obſervatory; but in 1790 a large one was built at a very conſiderable expenſe, by the king of Sardinia, at the Royal College of Nobles, and the direction of it given to the abbé Caluſo.

At Venice an obſervatory was conſtructed by father Panigai, and a ſmall one near the town by M. Miotti. One was alſo built at Parma by father Belgrado, and another at Breſcia by father Cavalli.

At Verona, Cagnoli, eminent both as a mathematician and aſtronomer, erected an obſervatory at his own expenſe in 1787, and placed in it the beſt inſtruments, with which he has made very accurate and important obſervations, particularly on the preceſſion of the equinoxes, and on the places of 473 northern ſtars, and 28 ſouthern, of which he has made a catalogue. In theſe determinations he has been perhaps more attentive than any other aſtronomer to the minute changes of refraction, and to the aberration of light.

At Padua there is an obſervatory, which, in 1778, was furniſhed with inſtruments chiefly made by Ramſden. It has been many years under the direction of M. Toaldo, who has publiſhed ſeveral uſeful works, eſpecially a treatiſe on Meteorology, which gained him the prize at the academy of Montpellier.

The obſervatory at Padua was originally the tower of the cruel tyrant Egellin, in the 13th century; in the dungeons of which he confined ſuch priſoners of war as fell into his hands during the civil commotions of that period. In 1769 it was converted into an obſervatory, and this happy change gave riſe to the following diſtich of father Boſcovich; who united the rare talents of poet and mathematician.

" Quæ quondam infernas turris ducebat ad umbras,
Nunc Venetum auſpiciis pandit ad aſtra viam."

which may be thus tranſlated:

" This tow'r, which led to Pluto's realms below,
To heaven's bright regions now the way doth ſhew."

In ſome of the iſlands of the Mediterranean obſervatories have alſo been eſtabliſhed. We ſhall, however, notice only thoſe of Malta and Sicily.

In 1783, the grand maſter Emmanuel de Rohan, an amateur and enlightened protector of ſcience, invited to Malta chevalier d'Angos, a ſkilful aſtronomer, who converted a tower of the palace into an obſervatory, which was furniſhed with the fineſt inſtruments that could be procured. In a few years he made a great number of valuable obſervations, which he intended to publiſh, but in March 1789, the obſervatory having caught fire, the inſtruments were broken, and the papers burnt, a ſerious loſs to aſtronomy, particularly as this was the moſt ſouthern obſervatory of Europe, in latitude 36°.

At Palermo an obſervatory has been conſtructed in the palace of the viceroy, under the direction of father Piazzi, who went to Paris in 1787 to ſtudy aſtronomy, and who afterwards viſited England, in order to conſult the principal artiſts on the conſtruction of inſtruments. In 1789 he returned to Palermo, and added to the apparatus a fine tranſit inſtrument, and a complete circle, made by Ramſden. His firſt labours were directed to the formation of a correct catalogue of ſtars, and, as a foundation, he choſe Wollaſton's catalogue, and particularly, as his chief points of reference, Dr. Maſkelyne's 36 ſtars. The poſitions of ſome of the larger ſtars he verified by nearly a hundred obſervations, and in the proſecution of this taſk, in 1801, he diſcovered a new planet, which he named Ceres, in honour of Sicily, as that iſland was, on account of its fertility, anciently conſecrated to the goddeſs Ceres. This diſcovery was the more important, as it excited the curioſity and reſearch of other aſtronomers, by which three more planets have been ſince diſcovered.

*Engliſh Obſervatories.*—The *Greenwich obſervatory*, or the Royal Obſervatory of England, was built and endowed by king Charles II., who, to uſe the words of Bailly, "well knew how eſſential aſtronomy was to a maritime and commercial people like the Engliſh, who aſpired to the empire of the ſeas." This building was erected on the ſcite of the ancient moated tower of duke Humphrey, uncle to Henry VI., and the firſt ſtone of it was laid Aug. 10, 1675, by Mr. Flamſteed, who had been appointed aſtronomer royal. It is ſituated on the higheſt eminence of Greenwich park, about 160 feet above low water mark. The ſoil here is particularly favourable for ſuch an inſtitution, being of a flinty gravel, through which the rain ſoon paſſes, and thus the atmoſphere is generally dry, which contributes to the preſervation of the inſtruments, as well as to the uniformity of refraction.

This eſtabliſhment comprehends two principal buildings, one of which is the obſervatory, and the other the dwelling-houſe of the aſtronomer royal. The obſervatory is an oblong edifice, running eaſt and weſt, and containing four rooms, or apartments on the ground-floor. The firſt, or moſt eaſterly room, has been lately erected for the reception and fitting up of a very fine tranſit circle, by Troughton, and a clock of great value by Hardy.

The next apartment is the tranſit room. It has a double ſloping roof, with ſliding ſhutters, which are opened both north and ſouth, with great eaſe, by pulleys. The tranſit inſtrument, which is eight feet long, and the axis three feet, is ſuſpended on two ſtone pillars. This inſtrument is famous as having been uſed by Halley, Bradley, and Maſkelyne. It was originally made by Bird, and has been ſucceſſively improved by Dollond and Troughton. The aſtronomical or tranſit clock, which is attached to a ſtone pillar, was made by Graham, and has been rendered very accurate by Earnſhaw.

The third apartment is the aſſiſtant obſerver's library and place for calculation; and the weſtern apartment of the building is the quadrant room. Here is erected a ſtone

ſtone pier, running north and ſouth, to which are attached two mural quadrants, each of eight feet radius. That on the eaſtern face, which obſerves the ſouthern meridian, was made by Bird, and the other, which obſerves the northern, by Graham. Suſpended to the weſtern wall is the famous zenith ſector, with which Bradley made the obſervations at Kew and Wanſtead, that led to the diſcoveries of the aberration of light, and the nutation of the earth's axis.

South of the quadrant room is a ſmall wooden building for making occaſional obſervations in any direction, where only the uſe of a teleſcope, and an accurate knowledge of the time, are required. It is furniſhed with ſliding ſhutters on the roof and ſides, to view any point of the hemiſphere, from the prime vertical down to the ſouthern horizon. It contains ſome excellent teleſcopes, particularly a forty-inch achromatic, with a triple object-glaſs, and a five-feet achromatic, both by Dollond; with a ſix-feet reflector, by Dr. Herſchel.

To the north of the obſervatory and eaſt of the houſe are two ſmall buildings, covered with hemiſpherical ſliding domes, in each of which is an equatorial ſector, by Siſſon, and a clock, by Arnold. Theſe are chiefly uſed for obſerving comets.

With reſpect to the dwelling-houſe, the lower apartments are occupied by the aſtronomer royal, and over them is a large octagonal room, which contains a great variety of aſtronomical inſtruments, with a library, conſiſting chiefly of ſcientific and ſcarce works. On the top of the houſe is an excellent camera obſcura, which could not be better placed for the exhibition of intereſting objects.

It is not unworthy of notice, that early in Flamſteed's time there was a well ſunk in the ſouth-eaſt corner of what is now the garden, behind the obſervatory, for the purpoſe of ſeeing the ſtars in the day-time, and obſerving the earth's annual parallax. It was a hundred feet deep, with ſtone ſtairs down to the bottom: but it has been long arched over, as the improvements in the teleſcope have rendered it unneceſſary for aſtronomical purpoſes.

The obſervations made at the Royal Obſervatory are univerſally allowed to poſſeſs an unrivalled degree of accuracy. M. Delambre, in a paper compoſed by him, on the life and labours of Dr. Maſkelyne, and read before the National Inſtitute, Jan. 4, 1813, makes the following remark. "He (Dr. Maſkelyne) has given a catalogue of ſtars, not numerous, but ſo accurate, as to have ſerved, almoſt ſolely for the laſt 30 years, as the foundation of all aſtronomical reſearches. In ſhort, it may be ſaid of the four volumes of Obſervations which he has publiſhed, that if, by a great revolution, the ſciences ſhould be loſt, and that this collection only were ſaved, there would be found in it ſufficient materials to conſtruct almoſt an entire edifice of modern aſtronomy; which cannot be ſaid of any other collection."

For ſimilar atteſtations made by foreign aſtronomers of the utility and importance, as well as ſuperior accuracy, of the Greenwich obſervations, ſee our life of Dr. Maſkelyne.

The following are the names of the aſtronomers who have officiated here in ſucceſſion, with the times of their ſervices reſpectively: Flamſteed, 43 years; Halley, 23 years; Bradley, 20 years; Bliſs, 2 years; and Maſkelyne, 46 years. (For a particular account of their labours, ſee their lives, as well as the various aſtronomical articles of this work.) Dr. Maſkelyne has been ſucceeded by John Pond, eſq. F. R. S. who was appointed aſtronomer royal in February 1812.

In giving a deſcription of the Royal obſervatory, it may be deemed an omiſſion not to notice the peculiar beauty of the ſituation. The building itſelf is no way remarkable, but it commands one of the fineſt proſpects, perhaps, in the world, both for richneſs and variety; and the intereſt of the view which it commands of public proſperity is greatly enhanced by conſidering that it is chiefly the reſult of nautical ſcience; and that thoſe numberleſs veſſels which cover the Thames with the wealth of nations, and which traverſe the remoteſt ſeas, owe their ſcience and their ſafety, in a great meaſure, to the Greenwich obſervatory.

*Dr. Herſchel's Obſervatory* at Slough, near Windſor, though not a fixed one, will ever claim a diſtinguiſhed place in the hiſtory of aſtronomical inſtitutions. It differs from all other obſervatories in plan and apparatus; and it exceeds all others in the number of its diſcoveries. For this important eſtabliſhment the world is indebted to the munificence of his preſent majeſty, George III., who has liberally patronized Dr. Herſchel, and who on other occaſions has ſhewn himſelf a zealous and enlightened promoter of aſtronomy.

In deſcribing this obſervatory, it ſhould be premiſed, that Dr. Herſchel's labours derive a peculiar character and intereſt from the circumſtance, that his diſcoveries are the reſult of his own inventions. For to his profound knowledge of aſtronomy he unites that of optics, both in theory and practice, by which he has been enabled to caſt and poliſh mirrors for reflecting teleſcopes, greatly ſuperior to any others, not only in magnifying power, but in collecting, or, as it were, preſerving light, by which viſion is wonderfully extended, and which he very expreſſively denominates "the power of penetrating into ſpace." The teleſcopes, which are all made under his direction, are of various ſizes, from two feet in length up to forty feet, and the apparatus and machinery with which they are mounted are alſo of his invention, and exhibit a very ingenious diſplay of mechaniſm.

As his larger teleſcopes could not be conveniently managed within the cover of a building, they are mounted in the open air, where they ſtand pointing to the heavens in different directions, and make a moſt magnificent and impreſſive appearance. Thus they are placed in what has been called the primitive obſervatory of man, "non ſub tecto ſed ſub cœlo in puro dio."

His largeſt teleſcope, which La Lande ſays he viewed with aſtoniſhment, is 40 feet long and 5 in diameter. It contains a mirror of about a ton weight; and this great inſtrument, with nearly an additional ton of caſes, &c. is managed by a very ſlight force. It is placed on a large circular frame, which turns on rollers, and the top is ſuſpended by ropes from very lofty ladder-work. Thus, by a ſyſtem of wheels, pinions, racks, and pulleys, the motions, both horizontal and vertical, are given, and hence any celeſtial object is readily found and commodiouſly viewed. It was finiſhed in 1787, and on the firſt trial a new ſatellite of Saturn was diſcovered by it, and a ſecond ſoon after.

For a particular deſcription of Dr. Herſchel's teleſcopes, with their reſpective magnifying and ſpace-penetrating powers, ſee our article TELESCOPE; and for his various diſcoveries, ſee ASTRONOMY, DOUBLE *Stars*, GALAXY, MOON, NEBULÆ, PLANET, SATELLITE, STAR, and SUN. It ſhould be further ſtated here, that a very full and accurate account of his inventions and diſcoveries, as well as a particular deſcription of his teleſcopes and their apparatus, (with plates,) will be found in the Philoſophical Tranſactions, to which he has been a moſt important contributor, having ſupplied that work with nearly 70 elaborate and ingenious communications.

We cannot conclude this ſketch without noticing two of his teleſcopes, of ſmaller ſize, which are famous in the annals of diſcovery. The firſt is a two-feet Newtonian reflector, with which his ſiſter Miſs Carolina Herſchel, whoſe aſtronomical attainments do great honour to her

ſex, diſcovered ſix comets; and the other is his ſeven-feet reflector, by which he diſcovered the Georgian planet at Bath, in 1781.

This teleſcope has, in conſequence of the diſcovery, been made a conſtellation in the heavens with the univerſal approbation of aſtronomers. It is placed between Gemini, the Lynx, and Auriga, and contains 81 ſtars. In Bode's atlas it is engraved with its apparatus, and marked "Teleſcopium Herſchellii."

This effectual mode of conferring immortality has been happily noticed by a ſcientific nobleman, the earl of Roſſe, who lately paid a viſit to Dr. Herſchel, and on ſeeing the doctor's name thus written among the ſtars, applied the following lines from Prior, and immediately added the concluding couplet, which is well worthy of being preſerved.

"Thus the diſtinguiſhed part of men,
With compaſs, pencil, ſword, or pen,
Should in life's viſit write their name
In characters that may proclaim
That they with ardour ſtrove to raiſe
At once their own and country's praiſe."
But Herſchel's fame ſhall higher riſe,
His name is written in the ſkies.

Dr. Herſchel, though in his 75th year, is ſtill an active and indefatigable obſerver. He was born at Hanover, Nov. 15, 1738, a period which will be ever memorable in the hiſtory of aſtronomy.

*The King's private Obſervatory* in Richmond gardens is extremely beautiful in ſtructure and apparatus, as well as in ſituation. It was built, in 1768, by order of his preſent majeſty George III., who, it is ſaid, made ſeveral obſervations here, particularly of the tranſit of Venus in 1769. It contains a fine tranſit inſtrument, a zenith ſector, and a mural arc, with ſeveral good teleſcopes, eſpecially a ten-feet reflector of Dr. Herſchel's. Here is a ſuperb equatorial on the top of the building, which is covered with a moveable roof. There are alſo two fine orreries, with an excellent collection of philoſophical inſtruments, and ſome caſes of minerals and other natural curioſities. It was built under the direction of Dr. Demainbray, and has been, for ſome years, in the care of Mr. Rigaud.

*Oxford Obſervatory* is a moſt magnificent ſtructure, and the inſtruments perfectly correſpond with the building. It was begun in 1772, from very ample funds bequeathed by Dr. Radcliffe, and the land on which it ſtands was the gift of the duke of Marlborough. The tranſit inſtrument, which is ten feet long, ſhews very ſmall ſtars in the day-time. It is ſaid to have coſt 150 guineas, the zenith ſector 200 guineas, and the two mural quadrants 600 guineas. There are alſo very excellent teleſcopes and clocks here, the former by Dr. Herſchel and Dollond, and the latter by Shelton. It was built under the direction of Dr. Hornſby, profeſſor of aſtronomy in the univerſity, who obſerved here for many years, and he has been ſucceeded by Dr. Robertſon, the preſent profeſſor of aſtronomy.

The obſervations are all regiſtered, and conſiſt chiefly of the right aſcenſions and zenith diſtances of the ſun, moon, planets, and fixed ſtars. In Dr. Hornſby's time, the regiſtry was ſometimes broken from ill health; for he had no aſſiſtant obſerver: but one has been of late added to the eſtabliſhment, ſo that the obſervations will not, in future, be liable to the like interruptions.

At CAMBRIDGE there have been ſmall obſervatories at Chriſtchurch, Trinity, St. John's, &c. and a plan is ſaid to be now on foot for erecting one upon a great ſcale, and worthy the ſcientific fame of that learned univerſity.

*Portſmouth Obſervatory.*—At the Royal Marine academy, Portſmouth, there is an obſervatory under the direction of Mr. Profeſſor Inman, which is of peculiar utility, both in teaching the pupils practical aſtronomy, and in finding the rate of time-keepers for ſeamen. It was built and many years ably managed by the late maſter, Mr. Bailey, who had been previouſly aſſiſtant aſtronomer at the Royal Obſervatory, and likewiſe with Capt. Cook in his latter voyages.

At *Chriſt's Hoſpital*, Mr. Wales (who had alſo ſerved under Dr. Maſkelyne and Capt. Cook) erected a ſmall obſervatory at his own expenſe, when he became maſter of the royal mathematical ſchool there; and lately the governors, at the recommendation of Mr. Evans, the preſent maſter, have ordered that the obſervatory ſhall be repaired, and furniſhed with new inſtruments.

The Royal Society have at Somerſet Houſe a ſmall obſervatory, which is generally ſuperintended by the ſecretary for the time being.

At *Highbury Houſe* an obſervatory was built in the year 1787, by Alexander Aubert, eſq., which for perfection of plan and ſplendour of apparatus perhaps has never been equalled by any private individual. This gentleman, whoſe ſcientific and liberal purſuits deſerve honourable mention, died in the year 1806, and his grand collection of inſtruments was diſpoſed of by auction, and of courſe diſperſed. Similar notice may be taken of other obſervatories contemporary with that of Highbury, particularly thoſe of count Bruhl at Harefield, ſir George Shuckburgh, at Shuckburgh, and William Larkins, eſq. at Blackheath, all of which were on a great ſcale, and have been diſcontinued after the demiſe of the owners. Thus in private obſervatories, though the aſtronomers may bequeath their apparatus to their heirs, they cannot transfer either their taſte or their ſcience. It is only in public eſtabliſhments that permanence can be expected.

Among the private obſervatories of the preſent day, the following alphabetical liſt may be alſo mentioned.

| | |
|---|---|
| Blackheath - | Stephen Groombridge, eſq. |
| Blenheim - | Duke of Marlborough. |
| Cambridge - | Rev. Mr. Catton. |
| Chiſlehurſt - | Rev. Francis Wollaſton. |
| Derby - | William Strutt, eſq. |
| Eaſt Sheen - | Rev. William Pearſon. |
| Finſbury Square | Dr. Kelly. |
| Godwood - | The duke of Richmond |
| Goſport - | Dr. William Burney. |
| Hackney Wick | Colonel Beaufoy. |
| Hayes - | William Walker, eſq |
| Highbury Terrace | Capt. Huddart. |
| Hoddeſdon - | William Hodgſon, eſq. |
| Iſlington - | Gavin Lowe, eſq. |
| Paragon, Southwark | James Strode Butt, eſq. |
| Park-lane - | Sir Harry Englefield, bart. |
| Roſe Hill, Suſſex | John Fuller, eſq. |
| Sherburn - | Earl of Macclesfield. |
| St. Ibbs, Hitchen | Mr. Profeſſor Lax. |
| Woolwich - | Rev. Lewis Evans. |

*Scotch Obſervatories.*—In the different univerſities of Scotland profeſſorſhips of aſtronomy have been eſtabliſhed, but it has been here, as in moſt other univerſities, the theory of the ſcience has been more attended to than the practice. At Edinburgh and Aberdeen there have been, however, obſervatories; and at Glaſgow there is alſo a ſmall one belonging to the college, but of late a magnificent one has been erected by a ſociety of gentlemen, which is likely, when finiſhed, to be very uſeful as well as honourable to that commercial city.

*Iriſh*

*Iriſh Obſervatories.*—In Ireland two obſervatories have been eſtabliſhed on a great ſcale, the one at Dublin, and the other at Armagh.

The obſervatory belonging to Trinity college, Dublin, commonly called the Dublin obſervatory, was begun in the year 1783. It was founded by Dr. Francis Andrews, provoſt of that college, who bequeathed a large income for this purpoſe, which was to commence upon a particular contingency happening in his family. When this event had taken place, the college, with their wonted zeal for the promotion of ſcience, determined not to loſe time by waiting for the accumulation; but advanced from their own funds a ſum conſiderably exceeding the amount of the original bequeſt.

They choſe for their profeſſor of aſtronomy and obſerver the Rev. Dr. Uſher, a man of extenſive learning and indefatigable reſearch, who was directed to proceed to England, to order from Mr. Ramſden the beſt inſtruments he could make, without any limitation of expenſe, and it may be here noticed, that the peculiar anxiety of this eminent artiſt to execute the order in the greateſt perfection, cauſed a conſiderable delay.

The apparatus firſt ordered were, a tranſit inſtrument of ſix feet focal length with a four feet axis, bearing four inches and a quarter aperture, with three different magnifying powers up to 600. An entire circle of ten feet diameter on a horizontal axis for meaſuring meridian altitudes. An equatorial inſtrument, with circles of five feet in diameter: and an achromatic teleſcope, mounted on a polar axis, and carried by an helioſtatic movement. Clocks were alſo ordered from Mr. Arnold, without any limitation of price.

The ſituation choſen for the obſervatory is on elevated ground, about four Engliſh miles N.W. of Dublin. The foundation is a ſolid rock of limeſtone, of ſeveral miles extent; and the ſoil is very favourable, being a calcareous ſubſtance called limeſtone gravel, which is remarkable for abſorbing the rain, and thus contributing to a dry atmoſphere.

The plan of the building unites at once both elegance and convenience: it fronts the eaſt, and the lower range of windows and doors are twenty-three in number. In the centre there is a magnificent dome of three ſtories high, with a moveable roof for the equatorial inſtrument, which is placed upon a pillar of ſixteen feet ſquare, of the moſt ſubſtantial maſonry, and ſurrounded by a circular wall of a foot diſtance, that ſupports the moveable dome, and alſo the floors, which in no part touch the pillar: thus, no motion of the floor or wall can be communicated to the inſtrument. The aperture for obſervation in the dome is two feet and a half wide. For the manner by which the movement of the dome is effected; ſee our article *Rotatory* Roof.

On each ſide of the centre building, and joined to it, are two handſome edifices, of two ſtories high, for the reſidence of the profeſſor, and to each is attached a wing of one ſtory only, but terminated with domes of two ſtories. Theſe domes are intended for occaſional obſervations, ſuch as of eclipſes, occultations, and comets. The wings, however, are not yet completely finiſhed.

But the moſt important erection belonging to this eſtabliſhment is behind the main building, and at right angles to it, in order to obtain an uninterrupted view both north and ſouth. This is the meridian or tranſit room, which contains both the tranſit inſtrument and the circle. It is thirty-ſeven feet long, twenty-three broad, and twenty-one high. Fine pillars of Portland ſtone are erected for both inſtruments on the moſt firm baſis, and the floor is ſo framed as to let all the pillars riſe totally detached from it: and ſuch was Dr. Uſher's attention to extreme accuracy, that he firſt aſcertained the pillars to be perfectly homogeneous, leſt any variety in their ſubſtance might admit of a difference in their expanſion or contraction by heat, cold, or other changes of atmoſphere. The clocks are attached to pillars of the greateſt ſteadineſs alſo: they were made by Arnold, who exerted his beſt ſkill, and are finiſhed in a maſterly manner: the pallets are of ruby; and all the laſt holes of the movement jewelled; the ſuſpenſion ſprings are of gold, with Arnold's own five barred pendulum, and cheeks capable of experimental adjuſtment, ſo as to make all vibrations iſochronal, whatever may be the excurſion of the pendulum.

Such are the plans and apparatus of this ſplendid eſtabliſhment. And we may now for a moment be permitted to turn our attention to the beauties of nature, which are ſtrikingly exhibited in the ſurrounding ſcenery; and which cannot be better deſcribed than in the words of Dr. Uſher himſelf, in the Tranſactions of the Royal Iriſh Academy, vol. i. p. 13.

"Around the dome is a platform commanding one of the moſt extenſive and varied proſpects that can be imagined. On the ſouth of the obſervatory there is a view of the grounds of lord Bective, with a gentle declivity to the river, and from thence a varied picture of the rich ſcenery of the woods of the Phœnix park, terminated in the back ground by the majeſtic grandeur of the Wicklow mountains. To the ſouth-eaſt we have the city of Dublin, diſtant four miles, the ſemicircular bay, with the ſhipping and the great ſouth wall extending five miles into the ſea, and terminated by the light-houſe; the ridge of rocky hills, called the Three Brothers, forming the head of Dalkey, and bearing Malpas's obeliſk on the higheſt point. Nearly in this direction, in particular ſtates of the atmoſphere, the Welſh mountains are diſtinctly viſible. On the eaſt and north-eaſt of Clontarf and its environs are the Hill of Howth, Ireland's Eye, and Lambay. From thence to the north-weſt the proſpect is ſo uncommonly level and extenſive as to gratify the aſtronomer much more than the painter; but even this variety is not without its beauty. To the ſouth-weſt we have the picturesque ruins at Caſtlenock, and to the weſt the extended and rich view of Kildare, in which Mr. Conolly's obeliſk forms a grand and central object."

Dr. Uſher did not, however, long enjoy the beauties of this ſcenery, nor the pleaſures of aſtronomy. He died in 1790, before the inſtruments had been all ſupplied. He was ſucceeded by the Rev. Dr. Brinkley, who had diſtinguiſhed himſelf at Cambridge by profound analytical inveſtigations, and who has ſince greatly enriched the Tranſactions of the Royal Iriſh Academy by mathematical and aſtronomical communications. His labours in practical aſtronomy, however, have been greatly impeded by the doubts and indeciſion of Mr. Ramſden, particularly in the conſtruction of the ten-feet circle, upon which very delicate and important operations depended. After making ſome progreſs in this inſtrument, he rejected it, and began another of nine feet diameter, which he proceeded in ſo far as actually to divide it, and this he rejected alſo, and fixed upon one of eight feet, which was left unfiniſhed at his death. After ſome years labour, his ſucceſſor, Mr. Berge, finiſhed the circle in a moſt accurate manner; and hence it was not placed in the obſervatory until July 1808, a delay which muſt have greatly circumſcribed the utility of the inſtitution. Ramſden's indeciſion is ſuppoſed to have ariſen from an opinion which he latterly formed, that very large inſtruments are moſt liable to get out of adjuſtment.

From this new circle in the hands of Dr. Brinkley, important reſults are expected, particularly on parallax, aberration of light, and refraction. He has been for ſome time engaged in a ſeries of obſervations with a view to explain the cauſe of variations that he has found in the zenith diſtances of certain ſtars at different times, which do not ſeem explicable

explicable by any cauſe at preſent generally allowed. He has found a difference between the zenith diſtances of α Lyræ, when in oppoſition and conjunction, which may be explained by a parallax of about two ſeconds. Such a parallax is, however, doubted; but it is by aſtronomers who have not had perhaps the accurate means, which he poſſeſſes, of referring their obſervations to the zenith. The new tranſit circle juſt erected at Greenwich poſſeſſes this advantage, and great hopes may therefore be formed from the concurrent operations of thoſe two inſtruments.

*Armagh Obſervatory.*—At Armagh, the metropolitan city of Ireland, and anciently the ſeat of a large univerſity, there has been an obſervatory erected and endowed in 1793, by the moſt reverend Richard lord Rokeby, primate of all Ireland, who diſtinguiſhed himſelf upon various other occaſions by very liberal grants for the diffuſion of ſcience and literature. Beſides founding a collegiate ſchool, and public library, he bequeathed a large ſum towards an object which he had always much at heart, the re-eſtabliſhment of a univerſity in this city, and it is ſaid that he thought this plan would be greatly promoted by previouſly erecting an obſervatory and muſeum here, which his lordſhip accompliſhed at the expenſe of about 15,000*l.*

The obſervatory is erected on the ſummit of a gently riſing hill, about 90 feet above the general level of the town, and ſurrounded by ſeveral undulating hills all nearly of the ſame altitude. This building is founded on a baſe of lime-ſtone, and all the walls are of large hewn ſtone, and of the moſt firm and ſubſtantial workmanſhip. The tower, which joins the dwelling houſe, contains a very fine equatorial by Troughton, fixed upon a large pillar, which is raiſed ſo high that the inſtrument in the dome can overlook all the buildings. To the eaſt of the houſe is a range of buildings for the tranſit room, and other aſtronomical purpoſes. The principal inſtruments, beſides the equatorial and tranſit, are a ten-feet ſextant by Troughton; a ten-feet reflecting teleſcope by Dr. Herſchel; a five-feet triple object-glaſs achromatic teleſcope by Dollond; and alſo a fine night glaſs upon an equatorial ſtand. The clocks are by Earnſhaw of London, and Croſsthwaite of Dublin.

In this eſtabliſhment a liberal income is allowed to the principal aſtronomer, and a good ſalary to his aſſiſtant. It has been ſuperintended from the beginning by the Rev. James Archibald Hamilton, D. D. dean of the cathedral church of St. Coleman, Cloyne, who has contributed ſeveral learned papers to the Tranſactions of the Royal Iriſh Academy, chiefly on aſtronomical ſubjects. His obſervations, particularly on the fixed ſtars, are conſidered very accurate, and ſome of his declinations have been tranſcribed into the Philoſophical Tranſactions of the Royal Society of London in 1806.

The regiſtered obſervations here are thoſe made with the tranſit inſtrument and equatorial; and alſo an account of the temperature and weight of the atmoſphere. Of theſe, a ſeries of about eighteen years is preſerved. The right aſcenſions of the ſun and moon, compared with the fixed ſtars, are regular and unbroken; but their north polar diſtances have not been ſo conſtantly taken, as they are only obſerved by the principal aſtronomer, whoſe paſtoral duties muſt occaſionally interfere with his aſtronomical labours.

It may be finally noticed, that there are belonging to this eſtabliſhment about 20 acres of plantation and pleaſure grounds, which are open for the recreation and health of the inhabitants of the city. Thus the views of the benevolent founder extended to various kinds of good. He ſpent a long life in acts of public and private beneficence, and his laſt work was the obſervatory, which he began in his 84th year; and which he juſt lived to ſee finiſhed.

*General Directions for Building and Furniſhing Obſervatories.*—The deſcriptions of the principal obſervatories in the foregoing columns have been the more minute, as ſuch may be ſuppoſed to convey more inſtruction than general directions; we ſhall, however, inſert here a few additional hints, which may likewiſe be found uſeful.

In building an obſervatory, attention ſhould be paid to ſituation, ſoil, and foundation, as well as to ſtructure; and in furniſhing one, regard muſt be had both to the proper choice, and convenient diſpoſition of inſtruments.

The *ſituation* ſhould be ſufficiently elevated to command a view of the horizon, eſpecially to the north and ſouth; but very high places are not eligible, as they moſtly attract clouds, and are in other reſpects too much expoſed to the ſeverities of weather.

In chooſing a ſituation, it will be requiſite to make preparation for a meridian mark, and for this purpoſe it would be convenient if the obſervatory could be placed in the meridian line of ſome building, or other permanent object, upon which the mark may be made, and this is done as ſoon as the tranſit inſtrument is ſet correctly in the meridian, by which it may be afterwards regulated. (See TRANSIT *Inſtrument.*) If two meridian marks can be ſet up, one north, and the other ſouth, it will be deſirable, and they ſhould not be leſs than 500 yards diſtant from the obſervatory: the farther the better, provided they are viſible. The obſerver ſhould have free acceſs to them, as it may be neceſſary ſometimes to illuminate them by night. Theſe marks ought to be nearly on the ſame level, and not ſubject to be obſcured by groſs exhalations, as ſuch are ſuppoſed to create horizontal refractions, and to make the marks appear out of the meridian.

The *ſoil* ſhould be naturally dry, which is generally the caſe when it is of a gravelly or ſtony kind; but clay ſoils that do not ſoon abſorb the rain cauſe exhalations and damps, which not only injure the inſtruments, and obſcure the atmoſphere, but greatly increaſe the irregularities of refraction.

The *foundation* ſhould be of the moſt ſolid kind, and therefore a rock of ſome extent, or a hard gravel, ſhould be choſen, and where ſuch cannot be had, all adventitious firmneſs ſhould be obtained either by conſtructing deep arches, or by piles driven with an engine; for ſuch is the perfection of modern inſtruments, that they immediately betray any defect in the building, whether ariſing from the foundation, or ſuperſtructure.

The *building* ſhould therefore be of ſolid and ſubſtantial maſonry, particularly the tranſit room, which is the moſt eſſential apartment of an obſervatory. This room ſhould, for the ſake of firmneſs, be on the ground, and the pillars which ſupport the inſtruments and clocks ſhould be detached from the floor. It ſhould of courſe poſſeſs a good view both north and ſouth, and the opening or meridian aperture for obſerving through ſhould command an uninterrupted view from the zenith to the horizon, in both directions; and the ſhutters or covers of the apertures ſhould be opened and ſhut with eaſe by pullies, or other ready methods. The proper width of the meridian apertures has been a ſubject of ſome doubt; but it is generally agreed that they ſhould be wide enough for pointing the inſtrument conveniently to the heavens, and for admitting a ready ſupply of freſh air into the obſervatory, ſo as to render the internal temperature equal to the external; and if the ſhutters be divided into ſmall openings, ſuch may be occaſionally uſeful to prevent a very hot ſun from affecting the adjuſtment of the inſtrument.

With reſpect to the other apartments, their number muſt depend on the number of inſtruments to be uſed, whether

at the ſame time, or in ſucceſſion. In moſt large obſervatories there is a dome raiſed for the equatorial or the circular inſtrument; for the plan of which, ſee *Rotatory* Roof.

As to the choice of inſtruments, and their convenient diſpoſition, regard muſt be had to the plan of building; and the number muſt alſo depend on the ſame, as well as on the number of obſervations to be made. An obſervatory, however, cannot be conſidered as well furniſhed without the following apparatus: a tranſit inſtrument, or mural tranſit circle, with good clocks to ſhew both ſolar and ſidereal time; and chronometers alſo are often uſeful. Mural quadrants or ſextants may be likewiſe mentioned; but entire circles are greatly preferable, as they admit of various ſelf-correcting adjuſtments, particularly when fitted up with revolving microſcopes. A portable reflecting circle ſhould alſo form part of the apparatus, in order to meaſure angular diſtances in all directions, horizontal, vertical, and oblique. If there be a circular inſtrument that will meaſure both altitudes and azimuths, or an equatorial inſtrument, then a moveable dome will be neceſſary.

A zenith ſector is likewiſe of importance, and of courſe good teleſcopes are eſſential, eſpecially an achromatic with an equatorial movement and a micrometer eye-piece; alſo a powerful reflector for obſerving the phaſes of the ſun, moon, and planets, as well as the ſatellites, nebulæ, &c.

A particular deſcription of the various inſtruments of an obſervatory will be found in this work, under their proper heads, with rules and examples for their uſe and application.

A Table of the Longitudes and Latitudes of the principal Obſervatories of Europe, as deduced from the moſt recent and accurate Determinations.

| Names of Places. | Longitude from Greenwich in Time. | Latitude North. |
|---|---|---|
| | h m s | ° ′ ″ |
| Amſterdam | — 0 19 32 | 52 22 17 |
| Armagh | + 0 26 30 | 54 21 15 |
| Berlin | — 0 53 26 | 52 31 45 |
| Blenheim | + 0 5 25 | 51 50 28 |
| Bologna | — 0 45 23 | 44 29 56 |
| Bremen | — 0 35 12 | 53 4 46 |
| Breſlaw | — 1 8 11 | 51 6 30 |
| Brunſwick | — 0 42 8 | 52 15 29 |
| Buda | — 1 16 10 | 47 29 44 |
| Cadiz | + 0 25 10 | 36 32 1 |
| Cambridge | — 0 0 17 | 52 12 36 |
| Caſſel | — 0 38 7 | 51 19 20 |
| Coimbra | + 0 33 37 | 40 12 30 |
| Conſtantinople | — 1 55 41 | 41 1 27 |
| Copenhagen | — 0 50 18 | 55 41 4 |
| Cracow | — 1 19 44 | 50 3 52 |
| Cremſmunſter | — 0 56 32 | 48 3 29 |
| Dantzic | — 1 14 32 | 54 20 48 |
| Dorpat | — 1 46 55 | 58 22 48 |
| Dreſden | — 0 54 50 | 51 3 9 |
| Dublin | + 0 25 20 | 53 23 14 |
| Eiſenberg | — 0 39 50 | 50 57 58 |
| Florence | — 0 45 3 | 43 46 41 |
| Genoa | — 0 35 52 | 44 24 59 |
| Glaſgow | + 0 17 4 | 55 51 32 |
| Gotha (Seeberg) | — 0 42 56 | 50 56 7 |
| Gottingen | — 0 39 42 | 51 31 54 |
| Greenwich | 0 0 0 | 51 28 40 |
| Highbury Houſe | + 0 0 23 | 51 33 30 |
| Hyeres | — 0 24 31 | 43 7 2 |
| Leipſic | — 0 49 28 | 51 20 44 |
| Leyden | — 0 17 55 | 52 9 30 |
| Lilienthal | — 0 35 35 | 53 8 25 |
| Liſbon | + 0 36 34 | 38 42 50 |
| London (Chr. Hoſ.) | + 0 0 24 | 51 30 57 |

| Names of Places. | Longitude from Greenwich in Time. | Latitude North. |
|---|---|---|
| | h m s | ° ′ ″ |
| Madrid | + 0 14 47 | 40 25 18 |
| Manheim | — 0 33 55 | 49 29 18 |
| Marſeilles | — 0 21 29 | 43 17 50 |
| Milan | — 0 36 45 | 45 28 2 |
| Mirepoix | + 0 7 30 | 43 5 19 |
| Mittau | — 1 34 51 | 56 39 6 |
| Montauban | — 0 13 19 | 40 0 55 |
| Montpelier | — 0 15 31 | 43 36 29 |
| Moſcow | — 2 30 12 | 55 45 45 |
| Munich | — 0 46 20 | 48 8 20 |
| Naples | — 0 57 5 | 40 50 15 |
| Nuremberg | — 0 44 17 | 49 26 55 |
| Oxford | + 0 5 2 | 51 45 38 |
| Padua | — 0 47 32 | 45 24 2 |
| Palermo | — 0 53 21 | 38 6 44 |
| Paris | — 0 9 21 | 48 50 13 |
| Peterſburg | — 2 1 13 | 59 56 23 |
| Piſa | — 0 41 26 | 43 43 11 |
| Portſmouth Academy | + 0 4 24 | 50 48 2 |
| Prague | — 0 57 41 | 50 5 19 |
| Ratiſbon | — 0 48 26 | 49 0 58 |
| Richmond | + 0 1 15 | 51 28 8 |
| Rome | — 0 49 51 | 41 54 1 |
| Slough | + 0 2 24 | 51 30 20 |
| Stockholm | — 1 12 13 | 59 20 31 |
| Straſburgh | — 0 30 59 | 48 34 56 |
| Touloufe | — 0 5 46 | 43 35 46 |
| Turin | — 0 30 40 | 45 4 14 |
| Upſal | — 1 10 36 | 59 51 50 |
| Utrecht | — 0 20 27 | 52 5 12 |
| Venice | — 0 49 24 | 45 25 54 |
| Verona | — 0 44 1 | 45 26 6 |
| Vienna | — 1 5 31 | 48 12 36 |
| Viviers | — 0 18 41 | 44 29 13 |
| Wilna | — 1 41 10 | 54 41 2 |

Note. The ſign — denotes Eaſt Longitude, and the ſign + Weſt Longitude, by which it is to be underſtood that addition or ſubtraction muſt be applied to the time of any given place, in order to find the correſponding time at the Greenwich Obſervatory.

OBSERVATORY, *Portable.* See EQUATOREAL.

OBSERVATORY *Iſland,* or *Padevoua,* in *Geography,* a ſmall iſland in the South Pacific ocean, near the N.E. coaſt of New Caledonia. S. lat. 20° 18′. E. long. 165° 40′.

OBSERVATORY *Iſland,* a ſmall iſland in the ſtraits of Magellan, at the entrance of Bougainville bay.

OBSERVATORY *Point,* a cape on the N. coaſt of the iſland of Tongataboo. S. lat. 21° 8′. E. long. 184° 55′.

OBSERVATORY *Inlet,* an inlet on the W. coaſt of North America, where Capt. Vancouver made his obſervation; extending about 32 miles, N. lat. 54° 58′. E. long. of the entrance 230° 6′.

OBSESSION, an action, or rather paſſion, of being beſet by an evil ſpirit; which, without entering the body, torments, and, as it were, beſieges the perſon without. In which ſenſe, obſeſſion differs from poſſeſſion.

The marks of obſeſſion, according to ſome, are a being hoiſted into the air, and thrown violently down without being hurt; ſpeaking languages never learnt; having an averſion to all acts and offices of religion, &c.

Some phyſicians look on all caſes of obſeſſion as natural, and curable by natural medicines, particularly by an unguent, called *unguentum corriohteri;* with purgatives, or vomitives.

Of this opinion is Dr. Gabriel Clauderus, member of the Leopoldine Academy, which he confirms with the teſtimony of Fromannus, in his treatiſe "De Faſcinationibus," and Ganſius de Corallis; adding, that it has been confeſſed by many witches and ſorcerers, that the plant hypericon, and other ſimples, &c. incommode them terribly, and prevent their operations.

He confirms this ſentiment hence, that the devil, in thoſe he thus beſets, makes uſe of the melancholic humour, or the atra bilis, and the groſſer impurities of the blood, without always acting immediately of himſelf. For which he refers to the books of Melchior Sebizius, and Jerom Jordan "De Divino in Homine;" and gives the proceſs of a cure of a manifeſt obſeſſion of a child of a year old at Delitſchebourgh, three leagues from Leipſic. In truth, the devil hath no ſhare in the matter. See DÆMONIACAL *Poſſeſſion.*

OBSIDIANUS LAPIS, in the *Natural Hiſtory of the Ancients,* the name of a ſtone which they have alſo deſcribed under the name of the *China marble.* It is very ſmooth and hard, extremely difficult to cut, but capable of a fine poliſh, and was uſed among the ancient Greeks for the making of reflecting mirrors.

The later writers have ſuppoſed the name obſidianus derived from ſomebody of the name of Obſidius, who was the inventor of this uſe of it; but it ſeems only a falſe ſpelling of the word *opſianus,* απο της οψεος, from ſeeing the images of things in it.

The obſidian, or Iceland agate, occurs in maſs, and alſo in rough, roundiſh, detached pieces. Its ſpecific gravity is 2.34. The obſidian of Iceland has been decompoſed by Bergman, and more recently by Abildgaerd, with the following reſults:

| Berg. | | Abild. |
|---|---|---|
| 69 | - | 74 Silex |
| 22 | - | 2 Alumine |
| 9 | - | 14 Oxyd of iron. |
| 100 | | 90 |

The hardneſs and opaque blackneſs of this mineral, added to the high poliſh of which it is capable, have cauſed it to be employed for various kinds of ornaments. In Peru, at the time of its conqueſt by the Spaniards, it was uſed for mirrors, and has been faſhioned in Europe into reflectors for teleſcopes. See AGATE and LAVA, Claſs 10.

OBSIDIONALIS, an epithet which the Romans gave to a ſort of crown with which they honoured ſuch of their generals as had delivered a Roman army, or fortreſs, beſieged by the enemy; and had raiſed the ſiege, or obliged them to decamp.

The word comes from the Latin *obſidio, ſiege.*

It was alſo called *graminea,* becauſe made of graſs or herbs found on the ſpot or ſoil.

It was the ſoldiery who beſtowed this crown; which, doubtleſs, was the reaſon of its not being of a more precious matter.

OBSKAIA, in *Geography,* a gulf or bay of Ruſſia, in the Frozen ocean, about 360 miles in length, and from 44 to 60 in breadth. N. lat. 66° 40′ to 72° 15′. E. long. 72° to 76°.

OBSTACLES *to Cultivation of Land,* in *Agriculture,* any ſort of impediments placed in the way of its improvement. Theſe are of various kinds, ſuch as ariſe from too much water below or on the ſurface of the ground, and which can only be removed by ſuitable kinds of draining; from the growth of wood either of the ſtrong or more ſhrubby ſorts, and which can only be made capable of cultivation, by being wholly cleared away and deſtroyed both in the root and top; and from ſtones of the rocky or other deſcriptions, either lying below or above the ſurface of the ground, and which require to be wholly, or in a great part, removed before any ſort of cultivation can be attempted. All theſe, and various others of a leſs obvious tendency, are frequently met with by the cultivator, and often oppoſe conſiderable obſtruction to the progreſs of his improvements, in bringing land into the ſtate of cultivation. See DRAINING.

But though theſe are ſome of the principal obſtacles that preſent themſelves from the nature of the lands themſelves; there are others which ariſe from the nature of the tenure or manner in which they lie or are held, and various other cauſes which do not depend upon the land. Theſe have been ſtated by Dr. Robertſon, in his Agricultural Survey of the County of Perth, to be, firſt, *townſhips,* by which he means a number of *plough-gates* in one village, or ſeveral tenants about one plough; ſecondly, the cuſtom of *runrig,* or an intermixture of property; thirdly, the *uncertain boundaries* of eſtates; fourthly, the feudal cuſtom of ſervitudes, which are productive of various ill conſequences; fifthly, the cuſtom of thirlage to mills; ſixthly, the *ſhortneſs* of leaſes; ſeventhly, the *diſtance* from manure; and eighthly, *commons,* or lands in the ſtate of commonage. But beſides theſe, the taking of tithes in kind, and ſome other claims upon land, operate unfavourably to their cultivation. The particular methods in which theſe different cauſes operate in preventing the cultivation of lands, will be explained in ſpeaking of the ſeveral heads to which they particularly relate.

ORSTETRICAL ART, the art of midwifery. See DELIVERY, and LABOUR.

OBSTITA, among the Romans, a term uſed to ſignify places that had been thunder-ſtruck, which were otherwiſe called *bidentalia.* See BIDENTAL.

OBSTRUCTION, in *Medicine.* Any tumour or collection of matter, natural or morbid, which occaſions an impediment to the regular performance of the functions of any organ in the body, is ſaid to be an obſtruction. Such are the accumulation of excrement in the inteſtinal canal, or of bile in the ducts of the liver; the effuſions of ſerum in various cavities of the body, conſtituting hydrothorax, aſcites, and other

other ſpecies of dropſy; and the occurrence of all large tumours in the viſcera, which, by preſſure upon the contiguous organs, interrupt and derange their action. All chronic enlargements of the glands and other parts tend, by ſuch preſſure, to obſtruct the proper circulation and excretion of the fluids, and therefore to produce various ſecondary or ſymptomatic diſeaſes. Thus ſcirrhous tumours of the meſentery, pancreas, or of the liver itſelf, by preſſing upon the vena portæ, or great veſſel of the liver, are liable to produce dropſy of the belly, in conſequence of impeding the circulation of the blood through the veſſels of the abdomen, which therefore pour out the thinner or watery part of the blood into the cavity of the belly, from their exhalent extremities. The ſame tumours, if they preſs upon the bile-ducts, will impede the flow of the bile into the inteſtines, and occaſion jaundice. In a ſimilar manner, the functions of the lungs, heart, kidnies, brain, and every other organ of the body, are deranged by obſtructions, occurring within their own ſubſtance, or in the adjoining parts.

As obſtructions are ſeated in organs of various ſtructure, and conſiſt of diſeaſed changes of various nature, the proper treatment of the diſeaſes which they produce, can only be directed with ſucceſs, after a careful and ſkilful inveſtigation of the various ſymptoms connected with them. The connection of certain ſymptoms, with certain organic derangements of the internal parts, is learnt by an obſervation of the functions, which are particularly diſordered, aided by the knowledge acquired by previous examinations of the diſeaſed organs after death, and by a compariſon of them with the ſymptoms that had occurred during life. Hence the ſtudy of what is called morbid anatomy is of great importance in enabling the phyſician to aſcertain the nature of diſeaſes originating from organic obſtructions; and it muſt be obvious, that the univerſal adminiſtration of any particular remedy, as a deobſtruent, will be often altogether uſeleſs, and not unfrequently injurious.

The various diſeaſes, originating from obſtruction, will be found under their reſpective heads. See Dropsy, Jaundice, Marasmus, &c.

OBSTRUENTS. See Deobstruent.

OBSTRUXIT, *Quare* Obstruxit. See Quare.

OBTUNDENTIA, a word uſed by ſome authors to expreſs ſuch medicines as are given to obtund, or edulcorate the acrimony of the humours.

OBTURATOR, in *Anatomy*, an epithet applied to the large oval opening in the front of the os innominatum, and to various parts ſituated near it. The opening is called the obturator foramen; the ligament which occupies it, an artery, a vein, a nerve, and two muſcles, have the ſame epithet.

The *obturator externus* (ſous-pubo-trochanterien externe) is a muſcle of a triangular figure, ſituated at the upper and inner part of the thigh, and extending from the foramen ovale of the pelvis to the great trochanter. It ariſes from the anterior part of the bone forming the foramen ovale, and from the neighbouring portion of the obturator ligament. It grows narrower, and paſſes outwards and backwards, lying on the obturator ligament, on the iſchium, and on the orbicular ligament of the hip. It then aſcends behind the neck of the femur, and is fixed by a tendon to the lower part of the internal ſurface of the great trochanter, adhering firmly to the orbicular ligament. It is covered in front by the pectinalis, the adductors, and the quadratus. The upper edge is rather concave, and extends obliquely from within outwards, and from above downwards, from the pubes to the great trochanter: the obturator veſſels and nerve come over it towards the inſide, and it is connected, on the outſide, by cellular tiſſue, to the orbicular ligament. The inferior margin is nearly tranſverſe in its direction. The poſterior ſurface covers the obturator ligament, and a part of the bone.

This muſcle is fleſhy at its origin, and in moſt of its ſubſtance; but its attachment to the trochanter is tendinous.

It rotates the thigh-bone outwards, and draws it towards the oppoſite limb.

The *obturator internus* (ſous-pubo-trochanterien interne) is another muſcle of the thigh, very ſimilar to the former in ſize and direction, but placed within the cavity of the pelvis. It is flattened and triangular in its figure, and reaches from the foramen ovale to the trochanter major. It ariſes from the upper, lower, and internal edge of the foramen ovale, and from the obturator ligament. The fibres converge and form a tendon, which turns round the bone in the groove between the tuberoſity and ſpine of the iſchium, and paſſes out of the pelvis at the leſſer ſacro-ſciatic foramen. It then runs from within outwards, between the two gemini, which almoſt entirely cover it behind, and terminates by an inſertion in the back of the trochanter major.

The internal ſurface of this muſcle is covered by the levator ani, and the pudendal veſſels; the external covers the obturator ligament, and a part of the iſchium. On the outſide of the pelvis, the tendon lies upon the iſchium and the hip-joint, with the gemelli more or leſs cloſely adhering to it.

An interval is left between two portions of the muſcle, at its origin, and gives paſſage to the obturator veſſels and nerve.

The origin is fleſhy, and comparatively broad; the muſcle has become narrow where it turns round the iſchium, and it is ſtill narrower on the outſide of the pelvis, where it is almoſt entirely tendinous. A very well-marked burſa mucoſa covers the tendon and bone, where the former turns over the latter. The ſurface of the bone is covered by cartilage, over which, and over the correſponding ſurface of the tendon, a ſynovial membrane is extended. This burſa extends ſome way into the pelvis. From the ſharp turn which the muſcle makes over the bone at this part, the rubbing in its action muſt be very conſiderable: we find the bone here marked by ſeveral riſings, correſponding to diviſions in the tendon.

The obturator externus rotates the thigh-bone outwards: when the hip is bent, it will ſeparate the thigh from the oppoſite limb.

OBTUSE literally imports blunt, dull, &c. in oppoſition to acute, ſharp, briſk, &c.

Obtuse *Angle*, in *Geometry*. See Angle.

Obtuse-*Angled Triangle*, is a triangle, one of whoſe angles is obtuſe.

Obtuse-*Angular Section of a Cone*, a name given to the hyperbola by ancient geometricians, becauſe they conſidered it only in ſuch a cone, whoſe ſection by the axis is a triangle, obtuſe-angled at the vertex. See Conic *Sections*, and Hyperbola.

Obtuse *Appui*. See Appui.

OBVA, in *Geography*, a river of Ruſſia, which runs into the Kama, near Obvinſk.

OBVENTIONS, Obventiones, in *Ancient Law Books*, ſignify the produce of a benefice, or ſpiritual living; including oblations, tithes, rents, and other revenues.

OBVINSK, in *Geography*, a town of Ruſſia, in the government of Perm, on the Kama; 60 miles N. of Perm. N. lat. 58° 44′. E. long. 56° 14′.

OBY, or Ob, the largeſt river in the Ruſſian empire, anſwering to its name, which ſignifies "Great," originates

properly in the Chineſe Soongoria, from whence it iſſues in a copious ſtream, under the appellation of Tſhuliſhman; and in N. lat. 52°, and E. long. 103° 30′, falls into the lake Teletzkoe, in the Ruſſian territory. From this lake, called by the Tartars Altinkul, or Altyn, it flows out again under the name of By, not taking that of Oby until its junction with the Katunya. In its upper regions it has a ſtrong current, and ſeveral cataracts, and particularly a great number of iſlands, moſtly in the circle of Beroſof. At N. lat. 67°, and long. 86°, it diſcharges itſelf into the gulf of the ſame name, which unites it with the Frozen ocean in N. lat. 73° 50′, and long. 90°. The principal rivers which the Oby takes up in its courſe are to the left, the Katunya, the Tſharyſh, the Alei, the Irtyſh, the Konda, and the Soſva; to the right, the Tſhumyſh, the Tom, the Tſhulym, the Ket, and the Voch. Up as far as the mouth of the Ket, the Oby has moſtly high and rocky ſhores; but farther on, quite to its entrance into the Frozen ocean, it, generally ſpeaking, flows over a clayey, ſandy, and marly bed. It is navigable till very near up to the Teletzkoe-Ozero, uncommonly prolific in fiſh, and in many places is accompanied by foreſts of large pine and birch trees. The courſe of this river extends above 3000 verſts. Tooke's Ruſſia, vol. i.

Oby, or *Ouby*, a ſmall iſland in the Eaſt Indian ſea; 50 miles in length from E. to W., and from 12 to 20 in breadth. S. lat. 1° 36′. E. long. 124° 56′.

Oby, *Little*, a ſmall iſland near the W. coaſt of Oby. S. lat. 1° 26′. E. long. 127° 12′.

OCADH, a town of Arabia, in the province of Hedsjaz; 30 miles N.E. of Niab.

OCAMPO, Florian de, in *Biography*, a perſon of whom little is known, except what is learnt from a petition which he preſented to the Cortes of Valladolid, a few months before his death. In this petition he ſtated, that for twenty-eight years he had been employed upon the Chronicle of Spain, in conſequence of which he had been appointed chronicler to the emperor Charles V. in 1539. In 1547 he was made a canon of Zamora, but the duties of this ſtation deprived him of all leiſure for literary purſuits, and he therefore petitioned for a penſion of 400 ducats, being equivalent to the value of the preferment. This was favourably received, but Ocampo did not live to receive it. He took great pains in travelling through many countries in queſt of documents for his hiſtory, and boaſts of having copied every inſcription in Tarragona with his own hand. He ſays, he went down into the mine near Carthagena, not without riſk to his perſon. He had travelled abroad, and was once driven by ſtorms on the coaſts of Ireland. His chronicle only comes down to the death of the Scipios. After relating the fall of Syracuſe, Florian devotes a whole chapter to Archimedes; in this, he ſays, he wiſhed to indulge his own feelings, "becauſe it ſeems to me, that if chroniclers would look to this, it would be a more fitting thing to record in hiſtories, the remembrance of perſons ſo uſeful to the world, ſo worthy to have their inventions and benefactions praiſed by us all who come after them, than the cruelty and fierceneſs of ſo many battles, ſo much ſtrife and rancour, ſuch waſte of blood as we find to be their main ſubject of relation, being manifeſtly things injurious to our nature, and which ſhould be lightly related, or paſſed over in ſilence, as of bad example, when not called forth for the ſupport or defence of virtue, or of princes and good rulers, whom God commands us to regard in his place." Florian ſpeaks of a work that he deſigned to write upon mechanical inventions, which he had ſeen in his travels, and on ſome of which he had improved, with the view of ſetting forth the manner to be uſed in making them, and afterwards the reaſon and cauſes of all their effects and circumſtances, conformable to the principles of natural philoſophy. This writer is ſaid to have rendered more ſervice to Spaniſh literature, as an editor, than as an author. During his reſidence at Zamora, the printers of that city applied to him for ſomething to write, which they might publiſh for the uſe and glory of the kingdom. He fortunately had in his poſſeſſion the General Chronicle of Spain, which had been compiled by Alfonzo the Wiſe, which he gave them for the preſs, and he corrected the proofs with great care, and the moſt ſcrupulous fidelity. This edition was completed in December 1541, and is a very fine black letter book. There is a Valladolid edition of it of 1604, but the work is very rare. This author, ſays Mr. Southey, was born in 1499, and died in 1555. His father's name was Lope de Ocampo, who was natural ſon of D. Diego de Valencia, by Sancha Garcia de Ocampo. Gen. Biog.

OCANNA, in *Geography*, a large and antique city of Spain, and chief town of Lower Mancha, ſituated on an eminence on the ſide of New Caſtile and La Mancha, at the entrance of the plain of La Meſſade Ocanna. This place was formerly very ſtrong, and the remains of the old walls are ſtill viſible. It belonged for ſome time to the order of Calatrava; and was afterwards transferred to the knights of St. James, to whom it now belongs. In later times it has loſt much of its ſplendour, and is now partly in ruins. Ocanna contains four pariſhes, ſix monaſteries, five convents, a governor of the order of St. James, and an Alcade mayor. The inhabitants formerly carried on a conſiderable trade in gloves; it had 72 manufactories, and 103,480 dozen pair were ſaid to be made every year; but the importation of this article has put a ſtop to that branch of induſtry and commerce. It has now only one manufactory of leather for ſhoe-ſoles, and four of hard ſoap. The church of the Carmelites is the only edifice worthy of notice. One of its two fountains is grand and noble; and, as ſome ſuppoſe, was built in the reign of Philip II., but others think it more probable, that it was conſtructed at the time when the grand maſters of St. James, then ſo rich and powerful, lived at Ocanna; and, therefore, at a much earlier period than the reign of Philip II. The number of inhabitants is about 2000; 25 miles E.N.E. of Toledo. N. lat. 40° 1′. W. long. 3° 47′.

Ocanna, or *St. Anna*, a town of South America, in the province of St. Martha, on the Rio di Oro; 220 miles S. of St. Martha. N. lat. 7° 50′. W. long. 73° 26′.

OCCA, a ridge of mountains in Spain, being one of the principal ramifications of the Pyrenees, extending from the vicinity of Tortoſa in Catalonia, to Burgos in Old Caſtile.—Alſo, a river of Spain, which riſes near Burgos, and runs into the Ebro near Frias.

OCCACOKE, an iſland near the coaſt of North Carolina; 10 miles long, and from 1½ to 3 wide. N. lat. 36°. W. long. 76° 12′. A channel between this iſland and Cove bank is called Occacoke inlet. N. lat. 34° 55′. W. long. 76° 18′.

OCCAM, William, in *Biography*, an Engliſh ſcholaſtic divine of the 14th century, was a diſciple of Dun Scotus, to whom he was little, if at all, inferior in ſubtlety, and obtained the title of the "Invincible Doctor." He became a member of the order of Cordeliers, the general of which appointed him to write againſt pope John XXII.; the reſult of this was the work entitled "De poteſtate Eccleſiaſtica et Seculare," in which he boldly oppoſed the tyranny of the papal over the civil power. He was obliged, in conſequence of this piece, which expoſed the encroachments of the Roman ſee, and the corruptions of the monks, to betake

take himſelf to flight. He eſcaped from Avignon in 1327, and proceeded to Munich, where the emperor then was whoſe protection he ſought. Under his auſpices he again maintained the independency of the civil power, with reſpect to the eccleſiaſtical. He was joined by others, but Occam ſurpaſſed them all in the keenneſs and ſpirit of his ſatire, and hence it is thought that his "Dialogues between a Maſter and Scholar," and his other pieces intended to expoſe papal tyranny, were peruſed with avidity, and had no little effect in preparing the way for the downfall of the ambition and greatneſs of the popes. This oppoſition to the ſee of Rome drew down upon Occam a ſentence of excommunication, but he continued to live in ſecurity in the emperor's court, where he died in 1347. He was author of many works beſides thoſe already referred to, particularly of "Commentaries" on ſome of the pieces of Porphyry, Ariſtotle, and the ſentences of Peter Lombard. They were collected in 1476, and publiſhed at Paris in two volumes folio. Enfield's Hiſt. Phil. vol. ii.

OCCASIO, in *Ancient Law Writers*, denotes a tribute which the lord impoſed on his vaſſals, or tenants, on occaſion of war, and other exigencies.

OCCASIONAL Cause, &c. See Cause, Efficient, &c.

OCCATION, a term in the ancient huſbandry, by which they expreſſed what we do by harrowing, though they performed it with a different inſtrument, a kind of rake. With the teeth of this inſtrument they levelled the ground, and broke the clods, and, with the hand, ſtrewed the corn over this level ground. Then they brought on the plough, and ploughed it in; ſo that the grain was ſown in furrows, as we expreſs it, and uſually came up, as we ſee it does at this time with us, in the ſame caſe, in the lower parts only. After it had got a few leaves, they went over the ground again with the ſame inſtrument a ſecond time, to clear away the weeds, and move the earth about the roots of the young plants. If they did this lengthways of the furrows, the earth being ſomewhat hardened, there fell but little of it among the corn; but if they did it croſſways of the furrows, a great deal fell down upon, and among, the young plants, and, in a manner, buried them: they were uſually obſerved to grow better for this croſs harrowing, except in cold places; and the huſbandmen thought the vigour of the plants was owing to the burying them with new earth; but this was really rather prejudicial to them, and the advantage they had aroſe from the more deep ſtirring of the ground. Tull's Huſbandry.

OCCHIO, in *Glaſs Making*, the hole of the floor of the tower of the leer.

OCCIDENT, in *Geography*, the weſtward quarter of the horizon, or that part of the horizon where the ecliptic, or the ſun therein, deſcends into the lower hemiſphere.

Occident, *Equinoctial*, that point of the horizon where the ſun ſets, when entering Aries or Libra.

Occident, *Eſtival*, that point of the horizon where the ſun ſets at his entrance into the ſign Cancer, when the days are longeſt.

Occident, *Hybernal*, that point of the horizon where the ſun ſets, when entering the ſign of Capricorn; at which time, the days, with us, are ſhorteſt.

OCCIDENTAL, a term chiefly uſed in commerce, to diſtinguiſh commodities brought from the Weſt Indies, *i. e.* America, from thoſe brought from the Eaſt Indies, which are ſaid to be *oriental*.

In this ſenſe we ſay, occidental bezoar.

Occidental *Pearl*. See Pearl.

Occidental *Horizon*. See Horizon.

OCCINIANO, in *Geography*, a town of France, in the department of the Marengo; ſeven miles S.W. of Caſala.

OCCIPITALIS, in *Anatomy*, an epithet applied to the parts ſituated about the occiput, as an artery, vein, nerve, &c.

Occipitalis *Muſculus*. See Epicranius.

OCCIPITIS Os, a bone of the cranium. See Cranium.

OCCIPITO-Frontalis, a muſcle of the ſcalp. See Epicranius.

OCCIPUT, the back of the cranium, forming the protuberance immediately above the neck; or the particular bone forming that part of the ſkull.

OCCOA, in *Geography*, a bay on the S. ſide of the iſland of St. Domingo, into which fall the rivers Sipicepy and Ocoa. It lies E. of Neybe or Julienne bay, and is bounded S.E. by point Salinas, and W. by the E. point at the mouth of Bya river.

Occoa, a bay near the E. coaſt of the iſland of Cuba, in the Windward paſſage, about 20 miles E. of Guantanamo bay.

OCCOCHAPPY, or *Bear-Creek*, a river of America, in the Miſſiſippi territory, which diſcharges itſelf through the S.W. bank of Tenneſſee river, juſt below the Muſcle ſhoals. From this creek to the navigable waters of Mobile river, there is portage of about 50 miles.

OCCONEACHEA Islands, two long narrow iſlands at the head of Roanoke river, in Virginia, juſt below where the Staunton and Dan unite and form that river.

OCCULT, ſomething ſecret, hidden, or inviſible. The occult ſciences are, magic, necromancy, cabbala, &c.

Agrippa has ſeveral books of occult philoſophy, full of the vaineſt, wildeſt dreams imaginable: and Fludd nine volumes of the cabbala, or occult ſciences, wrapt up under figures or Hebrew characters.

Weak philoſophers, when unable to diſcover the cauſe of an effect, and unwilling to own their ignorance, ſay, it ariſes from an occult virtue, an occult cauſe, an occult quality.

Occult, in *Geometry*, is uſed for a line that is ſcarcely perceivable, drawn with the point of the compaſſes, or black-lead pencil.

Occult, or dry lines, are uſed in ſeveral operations; as the raiſing of plants, deſigns of building, pieces of perſpective, &c. They are to be effaced when the work is finiſhed.

OCCULTATION, in *Aſtronomy*, the time a ſtar or planet is hid from our ſight, by the interpoſition of the body of the moon, or of ſome other planet. See Eclipse.

Occultation, *Circle of Perpetual*. See Circle.

OCCUPANT, in *Law*, he that firſt ſeizes and takes poſſeſſion of a thing.

If a tenant hold land, &c. for the term of another's life, and ſuch tenant die firſt, without making any eſtate of it; he that firſt enters to hold that term out, is ſaid to acquire a property: and is called an occupant, by reaſon his title comes by the firſt occupation.

So if a tenant, for his own life, grant over his eſtate to another; if the grantee dies before him, there ſhall be an occupant.

OCCUPATION, or Occupancy, in the *Civil Law*, denotes the poſſeſſion of ſuch things as at preſent properly belong to no private perſon, but are capable of being made ſo. As, by ſeizing or taking ſpoils in war; by catching things wild by nature, as birds, and beaſts of game, &c.; or by finding things before undiſcovered, or loſt by their proper owners.

OCCUPATION is alſo uſed, in *Common Law*, for the putting a man out of his freehold in time of war.

Occupation amounts to the ſame with diſſeiſin in time of peace; only that the former is deemed not ſo great an offence. See DISSEISIN.

OCCUPATION is alſo uſed for holding tenure, or poſſeſſion. As, when we ſay, ſuch land is in the tenure or occupation of ſuch a man; that is, in his poſſeſſion.

OCCUPATIONS, in the ſtatutes De Bigamis, denote uſurpations upon the king, by uſing liberties or franchiſes a perſon is not entitled to.

As an unjuſt entry upon the king into lands and tenements is called an *intruſion*; ſo an unlawful uſing of franchiſes is called an *occupation*.

OCCUPATION-*Bridges* in a canal, are alſo called ſwing, ſwivel, or draw-bridges, and they are made for the private uſe of perſons whoſe lands adjoin the canal.

OCCUPAVIT, in *Law*, a writ which lies for him who is ejected out of his land, or tenement, in time of war; as a novel diſſeiſin lies for one ejected in time of peace.

OCCUPIERS *of Walling*, a term in the ſalt-works for the perſons who are the ſworn officers, that allot, in particular places, what quantity of ſalt is to be made, that the markets may not be over-ſtocked, and ſee that all is carried fairly and equally between the lord and tenant. Theſe perſons always appoint how many houſes ſhall work at a time; and when there is ſalt to be made, theſe appoint a cryer to proclaim it to all the workers, that they may put to their fires at the ſame time; and a like proclaiming of the time when they ſhall leave off; and thoſe who continue to work after this prohibition, are to have their ſalt ſpoiled or deſtroyed.

OCDA, in *Geography*, a town of Perſia, in the province of Irak; 150 miles E.S.E. of Iſpahan.

OCEAN, the vaſt collection of ſalt and navigable water which encompaſſes the whole globe of the earth.

The word comes from the Latin *oceanus*, of the Greek ωκεανος, which Euſtathius derives from ωκεως νεειν, *to ſlide ſwiftly*; others ſay, the Greeks borrowed it from the Phœnicians, who called the circumference of the ocean, *og*; from the Hebrew חוג, *hhog*, *circuit*, *ambit*.

The ocean is that huge body of waters, in which the two grand continents known to us, the new and old, are incloſed like iſlands.

By computation, it appears that the ocean takes up conſiderably more of what we know of the terreſtrial globe than the dry land: and recent diſcoveries have evinced that more than two-thirds of it are covered with water.

Dr. Keill computes the ſurface of the whole ocean to be 85490506 ſquare miles: ſo that ſuppoſing the depth of the ocean, at a medium, to be $\frac{1}{4}$th of a mile, the quantity of water in the whole will be 21372626$\frac{1}{2}$ cubic miles. See GLOBE, and *Magnitude of the* EARTH.

Yet Dr. Burnet computes that all the waters in the ocean were not ſufficient to drown or overflow the dry land ſo high as the ſcriptures ſay it was at the deluge: ſeven or eight oceans, according to him, would ſcarcely have ſufficed.

The ocean, penetrating the land at ſeveral ſtreights, or ſtraits, quits its name of ocean, and aſſumes that of *ſea*, or *gulf*; to which are uſually added ſome epithets, to diſtinguiſh it: as Mediterranean ſea, Perſian gulf, &c. In very narrow places it is called *ſtreights*, *ſinus*.

The ocean takes divers names, according to the divers countries on which it borders: as the Britiſh ocean, German ocean, &c. According to Maty, the ocean may be commodiouſly divided into *ſuperior*, or *upper*; and *inferior*, or *lower*.

OCEAN, *Upper*, which the ancients called the *exterior*, as environing all the known parts of the world, he ſubdivides, according to the four cardinal points, into the *northern*, *ſouthern*, *eaſtern*, and *weſtern*.

OCEAN, *Northern*, called alſo the *glacial*, *frozen*, and *Scythian*, is that part of the upper ocean next the north pole; bounded on the ſouth with the arctic circle, (hence called the *Arctic* ocean,) and the northern coaſts of Europe, Aſia, and America; and on the north with the unknown lands about the pole.

It is called the *icy* or *frozen* ocean, becauſe thoſe who have attempted a paſſage through it to China, &c. have always been ſtopped with the ice: and *Scythian* ocean, becauſe it waſhes the coaſts of Scythia. See FROZEN *Ocean*.

OCEAN, *Weſtern*, or *Atlantic*, is that part of the grand ocean which waſhes the weſtern coaſts of Europe and Africa, and the eaſtern of America, extending from the arctic circle to the equinoctial: or, more generally ſpeaking, is that which ſeparates the ancient continent from the new.

OCEAN, *Southern*, or *European*, is that part reaching from the equinoctial to the unknown antarctic lands. That part of this ocean which lies between the antarctic circle and the ſouthern pole is called the antarctic ocean, and is in fact only a continuation of the Pacific, Atlantic, and Indian oceans.

OCEAN, *Eaſtern*, or *Indian*, has its firſt name from its ſituation to the eaſt; and its latter from India, the chief country it waſhes. It reaches from the coaſt of Ajan to the Iſle aux Latrons, *i. e.* of *Thieves*.

It waſhes the ſhores of the eaſtern coaſt of Africa, and the ſouth of Aſia, and is bounded on the eaſt by the Indian iſlands, and the ſouthern continent.

OCEAN, *Inferior*, or *American*, is that vaſt part of the grand ocean, which waſhes the coaſt of America; unknown, in great meaſure at leaſt, to the ancients. It is divided into three parts, *viz.*

The *North ſea*, which waſhes the eaſtern coaſt of America, from the arctic circle to the tropic of Capricorn.

The *Magellanic ſea*, extending from the tropic of Capricorn to the Terra auſtralis incognita.

The *South ſea*, or *Pacific*, which waſhes the weſtern coaſts of America to the eaſt, as far as the iſle of Thieves; and from ſouth to north, from the tropic of Capricorn to the land of Jeſſo.

The *Pacific* ocean, in its whole extent, occupies nearly half the ſurface of the globe, from the eaſtern ſhores of New Holland to the weſtern coaſt of America. This ocean is diverſified with ſeveral groups of iſlands, which appear like the ſummits of vaſt mountains emerging from the waves. See PACIFIC *Ocean*.

OCEAN, *for the Saltneſs of the*, ſee SALTNESS.

OCEAN, *for the Tides obſerved in the*, ſee TIDES.

Phil. Sachſius, in 1664, printed a diſſertation, intitled "Oceanus Microcoſmicus," dedicated to Bartholine; wherein he ſhews that there is a circular motion in the waters, like that of the blood in the human body; that they all come from the ocean, and return thither again. The thought is Solomon's, Eccleſ. xii. See VAPOUR, SPRING, &c.

OCELLATI LAPIDES, in *Natural Hiſtory*, a name given by the ancients, ſometimes to expreſs certain ſtones found on the ſhores, and in the beds of rivers, and naturally marked with the figure of an eye; and ſometimes for ſmall round ſtones of the ſhape of the groove of the eye, made by art for children to play with, and of the nature of what

we call marbles. Suetonius tells us, that Auguſtus Cæſar uſed ſometimes to divert himſelf with playing *nucibus et ocellatis*.

The word *lapidibus* is underſtood after the laſt word, and the meaning of the author plainly is, that he played like a boy, with nuts and marbles. But we have abundant teſtimony among the ancient naturaliſts of the word having been uſed alſo as the name of the gem which we now call *oculus beli*, and all thoſe other ſtones of the agate, or other ſemipellucid kinds, which had the figure of an eye naturally impreſſed upon them, that is a round ſpot of a different colour, in the centre of a ſmall roundiſh ſtone. Theſe were ſcarce among the ancients, becauſe they had none but the true oculi beli, or ſuch ſtones as were of a particular ſpecies, and were found naturally of the ſhape and ſize of an eye; but we have them much more common, becauſe our jewellers, whenever they find a natural ſpot in an agate, ſurrounded with a white circle, cut it out from the reſt of the ſtone, and ſell it as a natural oculus beli.

OCELLUM, in *Ancient Geography*, a promontory of Britain, generally ſuppoſed to be Spurn-head; and Mr. Baxter, with great probability, thinks the name is derived from the Britiſh word Ochel (Uchel) lofty. There is a very lofty mountain in Scotland, called Ocelli-mons, Ochill-hills, for the ſame reaſon.

OCELLUS, in *Biography*, an ancient Greek philoſopher of the Pythagorean ſchool, was a native of Lucania, whence the ſurname of the *Lucanian* is commonly given to him. The time in which he flouriſhed was the age before Plato, which is inferred from a letter preſerved by Diogenes Laertius, in which Archytas informed Plato that he had received ſeveral pieces written by Ocellus, from his grandſons. Among theſe was a treatiſe "Of Laws, or Kings and Kingdoms," of which a few fragments only remain, which are preſerved by Stobæus. Another of his works was a book "On the Univerſe," which has come down to us entire; this has been ſuppoſed by Thomas Burnet to have been compiled from the writings of Ariſtotle, and he regarded it as an epitome of the Peripatetic doctrine concerning nature, but others pronounce it to have been in exiſtence long before the time of Ariſtotle, and that this philoſopher borrowed many things from Ocellus, but made uſe of them in a ſenſe very different from that of their original author. A ſummary of the doctrine taught by Ocellus is given by Dr. Enfield in his abridgment of Brucker, vol. i. to which we refer our readers. It is a ſpecimen of the Pythagorean doctrine, intermixed with tenets peculiar to the author. He maintained that the univerſe never had a beginning, nor will have an end; that the world, in its preſent beautiful form, is to be diſtinguiſhed from the univerſe of which it is formed; and that the collection of all beings which forms the world is itſelf perfect and entire, and has no connection with any thing extrinſic. The immutable eſſences of Ocellus are the ſame with the intelligible natures of Pythagoras (ſee PYTHAGOREAN *Syſtem*); and the doctrine of Ocellus concerning dæmons, that they inhabit the ſublunar regions, is eſſentially different from that of Ariſtotle, who ſuppoſed no ſuch intelligences, except in the celeſtial ſphere. The work of Ocellus here referred to, was firſt printed in Greek at Paris in 1539; and at Venice in Greek with a Latin verſion by Lewis Nogarola in 1559: it has ſince gone through many editions, of which the moſt valuable is ſaid to be that of Dr. Thomas Gale, with the verſion of Nogarola, and learned notes, in his "Opuſcula Mythologica," printed at Cambridge in 1671. Moreri. Enfield's Hiſt. Phil.

OCELOT of Buffon, in *Zoology*, called by others the *Mexican cat*, and by Hernandez *tlacooxelotl*, is a ſpecies of cat, or FELIS *Pardalis* of Linnæus; which ſee.

This animal inhabits Mexico, the neighbourhood of Carthagena, and Brazil; lives in the mountains; is very voracious, but fearful of mankind; preys on young calves, and different ſorts of game; lurks amidſt the leaves of trees; and ſometimes extends itſelf along the boughs, as if dead, till the monkies, approaching to examine it, become its prey. Pennant.

OCHAGAVIA, in *Geography*, a town of Navarre; 23 miles E. of Pamplona.

OCHAN, a town of Ruſſia, in the government of Perm, on the Kama; 20 miles S.S.W. of Perm. N. lat. 57° 28'. E. long. 54° 30'.

OCHEL, a river of Sileſia, which runs into the Oder; nine miles below Beuthen.

OCHIL HILLS, an extenſive range of mountains in Scotland, commence in the pariſh of Dumblane, Perthſhire, and paſſing through Clackmannanſhire, along the north bank of the river Forth, ſtretch for many miles into the county of Fife. Theſe hills riſe, for the moſt part, abruptly from the valley, on their ſouthern ſide, and in ſome places their aſcent is almoſt perpendicular. The whole ridge may be characteriſed as covered with green, to its higheſt ſummit. The more gentle ſlopes abound with villages, hamlets, and farmhouſes, ſometimes ſkirted by woods, and ſometimes entirely enveloped in their umbrageous ſhade. The higheſt hill of the Ochils is Bencleugh, which, according to Mr. Stobie, is 2450 feet in height. From the ſummit, the proſpect is extremely fine and extenſive, as no height intervenes even to the German ocean, and the country it overlooks is, in general, fertile and well cultivated. From ſome points the ſpectator has a moſt remarkable view of the Carſes of Stirling and Falkirk, with the river Forth meandering through them. On a peninſulated rock in the centre of a deep glen in this part of the ridge, provincially denominated the Alva-hills, ſtand the venerable ruins of Caſtle-Campbell, belonging to the family of Argyle. From its ſolitary and darkſome ſituation, this pile was called the Caſtle of Gloom; and all the names of the adjacent places were, and ſtill are, ſuitable, being ſeated in the pariſh of Dolor, waſhed by the ſtream of Sorrow, and enveloped by the glens of Care. It was deſtroyed in 1645 by the marquis of Montroſe, who carried fire and ſword through the whole eſtate, with ſuch inhuman cruelty, that he only left one houſe unconſumed, which he erroneouſly ſuppoſed to belong to a neighbouring baron. The caſtle was anciently ſupplied with water by means of a ſecret ſtair cut downwards through the ſolid rock to one of the adjoining rivulets. This paſſage is ſix feet wide, and from its ſituation, overhung with impending rocks and trees, is frightful even to look into. It is called by the inhabitants Kemp's ſcore, or cut, from having been formed, as tradition relates, by a perſon of that name, to whom the fortreſs is ſaid to have originally belonged.

The Ochil hills are compoſed of red and grey granite, whinſtone, and various kinds of ſchiſtus; and contain numerous veins of the more uſeful minerals. Some portions of them exhibit traces of a volcanic origin, great quantities of lava being diſcovered on their ſides, or lying in immenſe maſſes in the vale below. In the weſtern diviſion of theſe hills an attempt was made to work a ſilver mine, but after four years continuance the work was abandoned as unprofitable. This happened in 1761, but previous to that period a valuable ſtratum of the ſame metal was diſcovered in the glen that divides the Middle-hill from the Wood-hill, above the pariſh of Alva. It was firſt perceived in ſmall ſtrings of

ſilver

ſilver ore, which, being followed, conducted the workmen to a rich maſs of, what is commonly called, virgin ſilver. The produce of this vein was no leſs than twelve ounces of the pure metal from fourteen ounces of ore. The expence of the diſcovery did not exceed 50*l.*; and during fourteen weeks the quantity raiſed weekly amounted to more than 40,000*l.* ſterling in value. When this maſs, however, was exhauſted, the ſilver diſappeared, and lead and other minerals were found in its ſtead, upon which the ſearch was given up for many years. But being renewed in 1759, a pit was ſunk below the ſpot whence the rich collection of ore was extracted, when another maſs of metal was laid open, which was at firſt ſuppoſed to be ſilver, though, on further examination, it proved to be the ſemi-metal called cobalt, which is uſed in forming the blue glazings of china-ware, and in giving a blue colour to glaſs. The cobalt of Alva was tried at Preſton-Pans works, and found to be equal in quality to that with which Europe is, in general, ſupplied from the mines of Saxony. Unhappily, however, the maſs of this mineral, like that of the ſilver, was ſoon exhauſted, and though ſmall quantities of it have ſince been diſcovered in various parts of the Ochils, it has never again appeared in ſufficient abundance to render it an object of commerce. The other metals found on theſe hills are copper, lead, and iron. About fifty years ago a copper mine was wrought in what is called the Mill-Glen, by an Engliſh company. The thickeſt ſtratum or vein meaſured about 18 inches; and four different ſtrata were traced. Iron-ſtone is very abundant in the Clackmannan diſtrict, and, in conſequence, an extenſive iron-work has been eſtabliſhed in the vicinity of that town under the firm of the Devan company. The vale at the foot of the Ochils, on the ſouth ſide, may be regarded as one vaſt field of coal, which forms the moſt important article among the exports of this part of Scotland.

Mr. Charles Mackenzie has lately communicated to the "Wernerian Natural Hiſtory Society," a mineralogical deſcription of theſe hills. The rocks of which they are compoſed, arranged according to their ſituation and relative antiquity, the loweſt and oldeſt being the firſt mentioned, and the uppermoſt or neweſt being the laſt, are 1. Red ſand-ſtone; 2. Amygdaloid; 3. Grey ſand-ſtone; 4. Lime-ſtone; 5. Slate-clay; 6. Clay-ſtone; 7. Tuff; 8. Baſaltic clink-ſtone; 9. Green-ſtone; 10 Clay-ſtone porphyry; 11. Compact felſpar. The different veins that traverſe the ſtrata of the diſtrict of which this ingenious obſerver has given an account, are, calcareous ſpar, ſteatite, heavy ſpar, iron, cobalt, ſilver, copper, and lead. The firſt part of Mr. Mackenzie's communication contains a geographical delineation of this beautiful and intereſting range of hills. Beauties of Scotland, vols. iii. and iv. A Tour in Scotland, by Thomas Pennant, three vols. 4to. London 1790.

OCHINUS, Bernardin, in *Biography*, a celebrated Italian Capuchin monk, who flouriſhed in the ſixteenth century, and became a convert to the Proteſtant faith, was born at Sienna in the year 1487. While very young he entered among the religious of the Franciſcan order diſtinguiſhed by the name of Cordeliers, but reſuming the lay-habit, he applied himſelf to the ſtudy of phyſic, and acquired the eſteem of cardinal Julio de Medici, who afterwards aſcended the pontifical throne under the title of Clement VIII. He was now ſeized with compunction for having quitted the religious profeſſion, and re-entered the order which he had abandoned, and to which he became, as well by his talents as his piety, a bright ornament. In 1534 he entered the reformed order of Capuchins which had been lately confirmed, and in this new connection he diſtinguiſhed himſelf by his regularity, his auſterities, and ſanctity of demeanour. He contributed ſo much to extend and improve the order, that by ſome writers he has been deemed its founder. In 1538 he was elected vicar-general of the order, in a chapter which was held at Florence, and ſo well did he conduct himſelf, that he was, in 1541, elected a ſecond time to that dignity, in a chapter that was held at Naples. He became eminent in the higheſt degree as a pulpit orator, and was attended by crowds, not only of the common people, but of the moſt illuſtrious prelates, princes, and men of rank. So great was his fame as a preacher, that he was invited to diſplay his talents in the moſt celebrated cities of Italy; and he was choſen chaplain and father confeſſor to pope Paul III. About the year 1541 he became acquainted with John Valdes, a Spaniſh civilian, who had embraced the opinions of Luther, and by him Ochinus was converted to the ſame faith, and became ſatisfied that Popery was a ſyſtem of deluſion and tyranny over the conſciences of men, and that evangelical Chriſtianity was to be found only among the profeſſors of the reformed communion. This important change in his opinions was ſoon made known, and he was ſummoned to the court of Rome to anſwer for himſelf. In his journey he met with Peter Martyr, (ſee his article,) at Florence, who had likewiſe abandoned the Popiſh religion, and having conſulted together, they agreed to retire to ſome country where they might be beyond the reach of the papal power. Accordingly Ochinus immediately ſet out, and arrived at Geneva in the year 1542; from Geneva he went to Augſburg, where he publiſhed ſome ſermons. While in this place he married, and in 1547, on the invitation of Cranmer, archbiſhop of Canterbury, he accompanied Peter Martyr to England, for the purpoſe of carrying on the great work of reformation in this country. Here they met with a very cordial reception at Lambeth, and laboured with great diligence and ſucceſs in promoting the object of their miſſion. In the year 1549 John Poynet, afterwards biſhop of Wincheſter, publiſhed in Engliſh Ochinus's "Dialogue of the unjuſt uſurped Primacy of the Biſhop of Rome," which he had tranſlated from the Latin. According to Wood, Ochinus was made a prebendary of Canterbury; and Neal ſays that he and Fagius were ſo far patronized, as to have penſions or canonries with a diſpenſation of reſidence; but upon the death of king Edward VI. Peter Martyr and Ochinus were obliged to quit England. They returned to the continent, and arrived at Straſburg in the year 1553. In 1555 Ochinus went to Baſil, and accepted an invitation to become miniſter of an Italian church, which was formed about that time at Zurich. Here he continued to officiate till 1563, when, eſpouſing ſome doctrines not agreeable to the theological ſyſtem of the Helvetic doctors, he was obliged to reſign his charge, and he retired to Baſil, from which place he was alſo driven, at the age of 76, and compelled to ſeek a ſanctuary in an inclement ſeaſon of the year. He fought refuge, but without ſucceſs, in Poland, an edict having been paſſed by king Sigiſmund, which baniſhed from his realms all heretics who were foreigners. Some of his friends would gladly have detained him in Poland, but he had learnt ſo much of the doctrine of paſſive obedience, as to declare that it was the duty of ſubjects to obey their ſovereign, and that he would ſet an example of obedience, and prefer death among the wild beaſts of the woods, than counteract his orders. He accordingly ſet out for Moravia, but was ſeized with the plague at Pinczow, which carried off two ſons and his daughter. Ochinus himſelf recovered ſo far as to be able to renew his journey, but he died in three weeks at Slawkaw, in 1564, about the age of ſeventy-ſeven. He was author of a vaſt number of works, written chiefly in Italian,

Italian, but they have been tranſlated into various languages: the moſt known are "A Commentary on the Epiſtle to the Galatians," and ſix volumes of ſermons.

OCHLOCRATIA, from οχλος, *multitude*, and κρατος, *power, command*, a form of government wherein the populace has the whole power and adminiſtration in its own hand.

OCHNA, in *Botany*, an old Greek name, whoſe etymology is very uncertain, retained by Linnæus for the preſent genus, in preference to a barbarous one, *Jabotapita*, which had been beſtowed, on what he ſuppoſed the ſame, by Plumier; (ſee GOMPHIA.) Whether Linnæus, in adopting *Ochna*, had any view in its derivation to the word αγχειν, *to ſuffocate*, on account of ſome of the germens being ſmall, or, as it were, abortive, can only be matter of conjecture, ſince he has left us no clue to warrant ſuch an aſſertion. Linn. Gen. 266. Fl. Zeylan. 93. Schreb. 354. app. 833. Willd. Sp. Pl. v. 2. 1158. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 297. Juſſ. 282. Lamarck Illuſtr. t. 472. f. 1.—Claſs and order, *Polyandria Monogynia*. Nat. Ord. *Coadunatæ*, Linn. *Magnoliæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of five, ovate, or oblong, ſpreading, permanent leaves, as large as the petals. *Cor.* Petals from five to twelve, oblong, deciduous. *Stam.* Filaments numerous, ſhort, permanent; anthers linear, erect, deciduous. *Piſt.* Germens ſuperior, generally as many as there are petals; ſtyle awl-ſhaped, longer than the ſtamens, permanent; ſtigma perforated. *Peric.* Drupas ſeveral, elliptical, pulpy, placed in a circle. *Seed.* Nut ſolitary, the ſhape of the drupa, with one kernel.

Eſſ. Ch. Calyx five-leaved, inferior, permanent. Petals numerous, nearly equal. Drupas ſeveral. Nut ſolitary.

1. O. *ſquarroſa*. Yellow-flowered Ochna. Linn. Sp. Pl. 731. Roxb. Coromand. v. 1. 62. t. 89.—Stalks many-flowered. Petals eight. Native of the Eaſt Indies, and introduced at Kew, by ſir Joſeph Banks, in 1790, where it flowers in July and Auguſt.—This is a ſmall *tree*, with alternate *branches*. *Leaves* rather crowded at the ends of the branches, alternate, on ſhort ſtalks, oblong, acute, finely ſerrated, ſmooth, four or five inches long, and nearly half as broad, when young they are beautifully tinged with purple. *Flowers* in lateral, alternate *cluſters*, large, yellow, inodorous. *Bracteas* ſmall, deciduous. *Drupas* when ripe nearly black.

2. O. *parvifolia*. Small-leaved Ochna. Vahl. Symb. v. 1. 33. Willd. n. 2. (Euonymus inermis foliis alternis ovatis ſerrulatis; Forſk. Ægypt-Arab. 204.)—Stalks ſingle-flowered.—Native of Arabia Felix.—"The habit of this *ſhrub* greatly reſembles that of the laſt ſpecies, but its leaves and inflorescence are conſiderably ſmaller.—*Branches* round, ſmooth, covered with an aſh-coloured, dotted bark. *Leaves* alternate, on ſtalks, quite entire at the baſe, veined, ſhining, only half an inch long. *Flower-ſtalks* lateral, ſolitary, gradually thickening upwards, purple, longer than the leaf." *Vahl.*

OCHO RIOS, in *Geography*, a bay on the N. coaſt of the iſland of Jamaica. N. lat. 18° 26'. W. long. 76° 56'.

OCHODONA, in *Zoology*. See LEPUS *Alpinus*.

OCHOTA, or OKHOTA, a river of Ruſſia, which runs into the ſea, at the town of Ochotſk.

OCHOTSK, or OKOTSK, a ſea-port town, or rather ſtation, of Ruſſia, which gives name to a province that is part of the government of Irkutſk, and from which veſſels ſail to Kamtſchatka. As the vicinity of this place produces little or no graſs, proviſions are brought hither from Yakutſk, both by land and water. Both modes of conveyance are difficult and tedious. The land carriage is by a road that lies over mountains, moraſſes, and through thick woods of larch and beech trees, and as the diſtance is 919 verſts, the journey with horſes and rein-deer takes up nearly ſix weeks. The latter are furniſhed for this purpoſe by the Tunguſians, who live in the neighbourhood of Ochotſk, near the ſea to which it gives name. N. lat. 59° 28'. E. long. 142° 44'.

This town is longer than it is wide, and extends from E. to W. nearly in a line. On the S. ſide is the ſea, at 100 yards from the houſes, with a beach of flints between. On the N. the walls are waſhed by the river Okhota, whoſe mouth is to the eaſtward, or at the extremity of a neck of land on which the town is built, and which widens towards the W. The buildings make but an indifferent appearance. Behind, cloſe to the river, is a ſtreet, inhabited by merchants, whoſe ſhops are regularly diſpoſed on each ſide. The port ſcarcely deſerves the name. M. de Leſſeps, when he viſited this place, counted ſeven or eight ſmall veſſels or galiots, ſome belonging to the crown, and others to merchants trading in furs to America. As Okotſk was the ſeat of government, and the principal mart for Ruſſian commerce, this inquiſitive traveller endeavoured to acquaint himſelf with the cauſes which firſt gave riſe to the enterpriſes of the Ruſſian colonies in that country, and which ſerved to fix them in it. He found, that by the conqueſt of the eaſtern part of Siberia, the Ruſſians got poſſeſſion of the rich mines with which they enriched themſelves, and which were held in little eſtimation by the inhabitants. To the extraction of iron, the conquerors added that of ſilver, of gold, and of other precious metals. The diſcovery of theſe ſources of wealth inflamed the courage of the adventurers, till the deſire of extending their dominions carried them to Irkutſk. At their firſt incurſions into the neighbouring countries, they perceived with regret that the ſame advantages were not to be expected. However, contemplating the clothing of the people, they were furniſhed with a new incentive to avarice, and determined to rob them of it; and on advancing further to the eaſt of Aſia, it was perceived that the furs became more beautiful; and hence the Ruſſians very eaſily perſuaded themſelves, that it would conduce to their intereſt and glory to ſubject every part of this vaſt territory to their laws. Accordingly they made themſelves maſters of the country as far as Okotſk, and puſhed their conqueſts in the north to the river Anadyr. Forts were conſtructed, and towns built. The Ruſſian merchants ſent their factors to Okotſk, which, from the advantages of its ſituation, became the metropolis. The navigation, however, was little more than cruiſing, and the veſſels from Kamtſchatka were chiefly galiots. The cargoes they brought back, that is, the precious ſtones taken from the inhabitants, either in barter or as impoſts, were ſent to the centre of the empire, and ſold under the direction of government, but without much profit, which was conſumed by the immenſe duties that were impoſed. In the mean time Okotſk flouriſhed, and the number of veſſels that entered its port daily increaſed as freſh connections opened freſh objects of traffick. The following is the mode of traffick adopted at Okotſk, whence ſeveral veſſels every year ſail for America. When a merchant wiſhes to make this voyage, he obtains permiſſion of the governor. The cargo is divided into ſhares, which are bought by thoſe who chooſe to become purchaſers. The price of the ſhares defrays the expence of fitting and of the different articles of merchandize, which conſiſt of ſtuffs, iron utenſils, glaſs trinkets, handkerchiefs, brandy, tobacco, and other commodities eſteemed by ſavages. The officers and ſailors have a part of the cargo inſtead of wages. Upon their return from a voyage, which laſts three, four, or ſix years, the

owners pay duties to the treaſury, and the remainder is valued and equally divided among the owners. A part of the merchandize is then ſent to Okotſk, and part to Yakutſk, thence to Irkutſk, and laſt of all to Kiachta, where the Chineſe become the purchaſers. Perouſe's Voyage, vol. ii. appendix.

OCHOTSK, or Okhotsk, *Mountains*, a great chain, known under the name of Stanovoi-Krebet, which borders upon the Nertſhinſkoi, or upon the Yablonoi-Krebet, near the region of the ſources of the Aldan and Oldekon, runs thence on one ſide northward on the Lena down to Yakutſk, and on the other ſide weſtward to the Oudinſkoi gulf of the Okhotſkoi ſea, which ſwarms with iſlands; proceeds round this to the Upper Okhotſk, and ſtrikes out ſeveral branches in the parts between the Lena and the Indighirka, between this and the Kolyma, and between this and the Anadyr, where a part of the mountain runs out upon the Tſhuſkoi promontory, while the other continues its courſe into the peninſula of Kamtſchatka. All theſe extenſive mountains are almoſt entirely unknown. From the diſtrict of Okhotſk have been brought jaſper, porphyry, and beautiful chalcedonies and carneoles, ſulphur-pyrites, native alum, agaricus aluminaris, mountain cryſtal, coals, &c.; and here are likewiſe warm ſprings. The mountain is, for the moſt part, not very abundant in woods. Its principal rivers on the Ruſſian or northern ſide are the Amga, the Aldan, the Uda, the Maia, the Yana, the Indighirka, the Kolyma, and the Anadyr.

OCHOTSKOE, or Okhotskoi, *Sea*, a large bay of the North Pacific ocean, on the E. coaſt of the Ruſſian dominions, ſo called from the ſea-port of Ochotſk, or Okhotſk. N. lat. 54° to 59°. E. long. 137 to 147°.

OCHRA, or *Gallinula* Ochra, in *Ornithology*, the name of a ſpecies of moor-hen. It is all over of a duſky and obſcure yellowiſh-green, and is browner on the breaſt and belly than on the back, yet with the ſame yellowiſh-green predominant; the head, neck, breaſt, and wings, have ſeveral white ſpots; and the face is in part white; the beak is part black, and part red; and the legs are of a yellowiſh colour. See Scolopax.

OCHRE, in the *Arts*, a yellow powder of an earthy appearance. It in general conſiſts of ſome earth, as lime or clay, combined with a ſub-ſalt or oxyd of iron.

The oxyd of iron in this ſubſtance is moſtly combined with either the ſulphuric or carbonic acids, and in general is derived from the decompoſition of ſuper-ſulphuret of iron. By expoſure to the air and moiſture, the latter ſubſtance is converted into ſulphuret of iron. This ſalt, by expoſure to the oxygen of the atmoſphere, ſoon reſolves itſelf into two ſalts, namely, the ſuper-oxyſulphat of iron and the ſub-oxyſulphat. The latter, being inſoluble, is precipitated, forming a yellow depoſit, frequently ſeen in ſuch chalybeate ſprings as reſult from the decompoſition of pyrites. This yellow precipitate penetrates the earth and tinges it with the ſame colour, but more dilute. The mixture conſtitutes a ſpecies of ochre. When the ſoil, with which the ſubſalt combines, conſiſts of certain proportions of lime and alumine, free from ſtones or other heterogeneous matter, the ochre is more valuable.

Thoſe chalybeate waters which contain the ſuper-carbonat of iron, and which are frequently found, are capable of forming ochre, but of a different quality from the laſt. The carbonat held in the water is ſuper-carbonat with the black oxyd of iron. By expoſure to the air an atom of carbonic acid eſcapes, the oxyd takes another atom of oxygen from the atmoſphere, and is precipitated with the other atom of carbonic acid in the form of oxycarbonat, which is in the form of an inſoluble powder of a yellow colour. This ochre is of a deeper yellow than that derived from the ſub-oxyſulphat. Its colour may be converted into a beautiful brown by applying a heat to it, ſufficient to expel its carbonic acid, leaving behind the ſecond oxyd of iron. The heat of boiling water is ſufficient for this purpoſe. This ochre, ſo changed, has moſt of the properties of umber. The ſub-ſulphat does not ſo readily aſſume the brown colour, on account of the greater heat required to expel its acid.

Artificial ochres may be prepared of equal, and perhaps of ſuperior quality to thoſe in nature. The ſulphat of iron in the manufacture of this article, previous to its cryſtallization, is partly in the ſtate of oxyſulphat, and becomes wholly ſo by long expoſure to the air. As it remains in this ſituation it will gradually reſolve itſelf into the ſuper-oxyſulphat and the ſub-oxyſulphat. The latter falls to the bottom of the veſſel in the form of a yellow powder, which, when waſhed and dried, conſtitutes a beautiful colour.

When carbonat of potaſh is added to the ſuper-oxyſulphat, the carbonat of iron will be formed, which will precipitate in the ſtate of a yellow powder. This powder, when waſhed, and the water evaporated, conſtitutes an ochre which is a little deeper in colour than the laſt. The heat of boiling water drives off the carbonic acid, leaving the oxyd of an agreeable brown colour.

Ochre, in *Agriculture*, a ſort of oxyd or calx of iron, which is frequently met with in ſome ſorts of ſoil. The author of Phytologia ſtates, that red ochre may in ſome caſes be favourable to vegetation, though it has generally been ſuppoſed prejudicial to it.

It is, however, ſtated by Mr. Nicol, that the moſt untoward of all ſoils, for the produce of timber in high perfection, is an irony till of little depth, lying on a retentive ſubſoil, which upholds a poiſonous ochry water, and which ſtagnates on the ſurface, or remains latent in the body of the ſoil, which is the paſture of the roots, contracting the mouths of the fibres, contaminating the juices, and finally operating to the deſtruction of the tree, by poiſoning it, and haſtening its diſſolution.

It is well known that ochres alſo form the baſis of various kinds of pigments, paints, and other ſimilar matters.

OCHREA, in *Botany*, Willd. Princip. of Bot. 50, a name given by Rottböll, to the peculiar kind of bractea, which enfolds the flower-ſtalks in *Cyperus*, and ſome ſimilar plants, in the form of a cloſe membranous ſheath. There ſeems little occaſion for this term, nor is it adviſable to give into the too general practice of botaniſts, who, in writing upon any one particular tribe or natural order, invent new terms without neceſſity. The terms *bractea*, *involucrum*, *receptacle*, &c. are univerſal, and we ſhould be involved in great confuſion if we had a ſeparate name for each in every different natural order. The cryptogamic authors are moſt prone to this inconvenient cuſtom, becauſe they fancy the plants with which they are converſant muſt, in every thing, differ from others.

OCHROITE of Klaproth, in *Mineralogy*, is the *Cerium* of the two Swediſh chemiſts, Hiſenger and Berzelius, and the *reddiſh* Tungsten of Scheele; which ſee.

OCHROMA, in *Botany*, ſo named by Profeſſor Swartz, from ωχρος, *pale*, in alluſion to the pallid hue of its flowers, leaves, and wool of its ſeeds. Swartz Prodr. 97. Ind. Occ. v. 2. 1143. Schreb. 454. Willd. Sp. Pl. v. 3. 605. Mart. Mill. Dict. v. 3.—Claſs and order, *Monadelphia Pentandria*. Nat. Ord. *Columniferæ*, Linn. *Malvaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth double, inferior; outer of three, lanceolate, falling leaves; inner of one leaf, funnel-ſhaped, five-cleft. *Cor.* Petals five, wedge-ſhaped, coriaceous.

*Stam.*

*Stam.* Filament one, cylindrical; anthers five, large, linear, connate, marked on the outside with zigzag furrows. *Pist.* Germen superior, oblong; style thread-shaped, inclosed by the filament; stigmas five, awl-shaped, twisted. *Peric.* Capsule coriaceous, somewhat cylindrical, angular, with five furrows, five cells, and five valves; valves internally woolly, revolute at the margin; partitions kidney-shaped. *Seeds* numerous, oblong.

Ess. Ch. Calyx double; outer of three leaves. Anthers combined, irregularly furrowed. Capsule five-celled, and many-seeded.

1. O. *Lagopus.* Down-tree. Swartz Prodr. 98. Act. Stockholm. for 1792. 148. t. 6. (Gossipium; Plum. MSS. v. 4. t. 8. Gossipium, seu Xylon arboreum; Pluk. Alm. t. 189. f. 2. Bombax pyramidale; Cavan. Diss. 5. t. 153. Hibiscus arborescens, trichotomus; foliis amplissimis cordato-angulatis; seminibus lanâ obvolutis; Brown. Jam. 286.)—Found in waste places on the hills of Jamaica and Hispaniola, where its beautiful flowers expand in February, and its capsules ripen in May. We think it flowered in great perfection, about two years since, in the stove of A. B. Lambert Esq. V.P.L.S., at Boyton in Wiltshire. The *trunk* of this *tree* is from twenty to forty feet in height, about twelve inches in diameter, erect, with a pale, ash-coloured, brittle *bark*. *Branches* terminal, twice or thrice forked, spreading, smooth. *Leaves* more than a foot in length, terminal, nearly vertical, scattered, heart-shaped or roundish, angulated, smooth and dark-green above, pale underneath, with rufescent hairs. *Stalks* horizontal, as long again as the leaves, round, rusty-coloured. *Flower-stalks* terminal, solitary, round, smooth, single-flowered. *Flowers* erect, three or four inches long, pale red or yellowish, somewhat succulent and fleshy. *Seeds* inclosed in a fine rusty down.

The growth of this tree is said to be very rapid, and its wood so light as to become a substitute for cork. The woollineſs of its seeds is particularly fine and silky, and is much used in the manufacture of fine hats.

OCHROPUS Gallinula, in *Ornithology*, a name by which many authors have called a bird more usually known by the name of tringa. See Tringa *Ochropus*.

Ochropus, or *Gallinula Ochropus*, the yellow-legged moor-hen, a species of the gallinula, or moor-hen. It is of the size of the common kind; its beak, as well as its legs, is yellow, or of a sulphur colour; its back is of a reddish-brown, the tips of its wings of a very fine red; it has white variegations on its head, and in the middle of its wings, and on its belly; the longest feathers of its wings are black; and there are also spots of black on the back in several places; the edges of its eye-brows are of a deep saffron-colour; and it has, beside all these colours, a great deal of grey in the wings; it has no hinder toe. It builds in thickets, in watery places, among rushes and high grass. See Fulica *Flavipes*.

OCHROSIA, in *Botany*, so called by Jussieu, from ωχρος, *pale*. Juss. 145. A shrub found by Commerson in the isle of Bourbon, where it is known by the name of Bois jaune, or Yellow wood. The *leaves* are three or four in a whorl. *Flowers* in axillary or terminal forked corymbs. *Calyx* minute, five-toothed. *Corolla* tubular, funnel-shaped; its limb in five deep spreading segments. *Style* one; *stigma* tumid. *Follicles* divaricated, drupaceous, ovate, each with a bilocular nut, with two or three kernels in each cell. *Seeds* unequal, flat, scarcely membranous at the summit.

Jussieu refers this genus to his *Apocineæ*, before *Tabernæmontana*, to which and to *Rauwolfia* he esteems it nearly allied.

OCHROXYLUM, a genus known only from Schreber, who had originally called it *Curtisia*, in commemoration of the well-known botanist of that name, but upon finding the same honour had previously been conferred on Mr. Curtis, in the *Hortus Kewensis*, Schreber changed the name to *Ochroxylum*, derived we presume from ωχρον ξυλον, *pale wood*. Schreb. app. 826. Mart. Mill. Dict. v. 3.—Class and order, *Pentandria Trigynia*. Nat. Ord. *Dumosæ*, Linn. *Rhamni*, Juss.

Gen. Ch. *Cal.* Perianth very small, permanent, divided into five, ovate, acute, spreading segments. *Cor.* Petals five, ovate, reflexed, rather obtuse, excavated below the top, thickish, with a thinner margin. Nectary an annular, somewhat three-lobed, fleshy gland. *Stam.* Filaments five, awl-shaped, flattish in the lower part, erect, a little longer than the corolla; anthers roundish, incumbent. *Pist.* Germens three, placed on the nectary, boat-shaped externally; styles short; stigmas simple. *Peric.* Capsules? three, approximating, nearly globular, inwardly compressed, insident on the lobes of the enlarged nectary, of one cell, bursting inwardly? *Seeds* two, convex on one side, compressed and angular on the other.

Ess. Ch. Calyx five-cleft. Petals five. Nectary an annular, three-lobed gland. Capsules? three, approximating, one-celled, two-seeded.

We are not aware that Schreber ever published an account of the species of *Ochroxylum*, neither is any thing known concerning it but what we find in his Genera above.

OCHRUS. See Pisum.

OCHSENBERG, in *Geography*, a town of Wurtemberg; 12 miles W. of Heilbronn.

OCHSENFURT, a town of the duchy of Wurzburg; 8 miles S.S.E. of Wurzburg. N. lat. 49° 4′. E. long. 20° 6′.

OCHSENHAUSEN, a town of Germany, near which is a princely abbey, founded as a priory in the year 1190, and raised to an abbey in 1391; 14 miles S. of Ulm.

OCHSENWERDER, an island in the Elbe, about eight miles long, and four wide, on which are several villages; 4 miles S.E. of Hamburg.

OCHTEE, a river which runs into the Weser, about eight miles below Bremen.

OCHTROP, a town of Germany, in the bishopric of Munster; 21 miles N.N.W. of Munster.

OCIER, a town of the island of Sardinia; 28 miles E.S.E. of Sassari.

OCIMUM, in *Botany*, Sweet Basil, ωκιμον of the Greeks, has been supposed to owe its name to the strong scent, for which several species of this genus are remarkable; but that scent is of too sweet and aromatic a quality, and too famous on that account, to accord with the true meaning of the verb οζω. Some derive the word from ωκεως, *quickly*, and suppose it alludes to the rapid germination or growth of the plant; a property which others rather attribute to a kind of fodder, termed *Ocymum*, distinct from *Ocimum*. Hence it appears that nothing certain is known on the subject. Linn. Gen. 300. Schreb. 396. Willd. Sp. Pl. v. 3. 158. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 422. Juss. 116. Lamarck Illustr. t. 514.—Class and order, *Didynamia Gymnospermia*. Nat. Ord. *Verticillatæ*, Linn. *Labiatæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, two-lipped, very short, permanent; upper lip flat, roundish, broadest, ascending; lower in four acute close segments. *Cor.* of one petal, ringent, reversed; tube very short, swelling upwards; one lip, which is turned uppermost, broadest, divided half way down into four obtuse equal segments; the

other, directed downwards, narrower, longer, undivided, ſerrated. *Stam.* Filaments four, declining, two of them rather the longeſt, and two furniſhed with each a lateral reflexed proceſs at the baſe; anthers creſcent-ſhaped. *Piſt.* Germen in four deep lobes; ſtyle thread-ſhaped, the length and poſition of the ſtamens; ſtigma cloven. *Peric.* none, except the cloſed calyx. *Seeds* four, ovate.

Eſſ. Ch. Upper lip of the calyx orbicular; lower four-cleft. Corolla reverſed; one lip four-cleft; the other undivided. Outermoſt ſtamens furniſhed with a proceſs at their baſe.

This genus conſiſts of a number of generally herbaceous, and annual or biennial, plants, with oppoſite, ſimple, ſtalked *leaves*, and racemoſe whorled *flowers*, whoſe *corolla* is pale or purpliſh, ſometimes ſpotted. They are for the moſt part of Eaſt Indian origin, and valued for their peculiarly fragrant ſmell, which in ſome inſtances reſembles that of the nutmeg. Whether for this reaſon, or for any other, ſeveral of the ſpecies are held in ſuperſtitious veneration by the Hindoos, and are uſed in their religious ceremonies. Twenty-one ſpecies are enumerated in the 14th edition of Syſt. Veg., but in theſe are included the genus PLECTRANTHUS of L'Heritier. (See that article.) Willdenow has twenty-ſeven, of which thirteen are mentioned in Hort. Kew., as cultivated in the Engliſh gardens; where they generally require to be kept in the ſtove or green-houſe, or raiſed on a hot-bed and afterwards planted out in the borders, under the protection of a wall. They have little but their ſcent to recommend them, nor do they all poſſeſs this claim to notice. We ſuſpect that ſeveral nondeſcript ſpecies are ſtill latent, amongſt the unexplored weeds of India, and that ſome of thoſe already deſcribed are not very correctly determined. We regret our inability to clear up theſe doubts. Seeds of ſome of the more celebrated kinds, ſent by our learned friend Dr. Buchanan for the purpoſe of inveſtigation, unfortunately failed to vegetate. The ſpecies moſt in eſtimation are known at Calcutta by the general appellation of Toolſey. The following may ſerve as examples.

O. *gratiſſimum.* Shrubby Baſil. Linn. Sp. Pl. 832. Willd. n. 5. Ait. n. 3. Jacq. Ic. Rar. t. 495. (O. zeylanicum perenne odoratiſſimum latifolium; Burm. Zeyl. 174. t. 80. f. 1.)—Stem ſhrubby. Leaves ovate. Cluſters cylindrical.—Native of Ceylon and other parts of the Eaſt Indies. Miller cultivated it in 1752. This is one of the few ſpecies whoſe *ſtem* is ſhrubby, forming a buſh two or three feet high. The *leaves* are ſtalked, truly ovate, though tapering at the baſe, and copiouſly ſerrated, two or three inches long, ſlightly downy, eſpecially on the ribs and veins; their ſmell, when gently touched, like cloves or nutmegs. *Flowers* very numerous, ſmall, downy, reddiſh, in long copious terminal, ſpreading, ſtraight cluſters.

O. *Baſilicum.* Common Sweet Baſil. Linn. Sp. Pl. 833. Willd. n. 9. Ait. n. 5. (Ocimum; Camer. Epit. 308. O. magnum; Ger. em. 673.)—Leaves ovate, ſmooth. Calyx fringed.—Native of India and Perſia. One of the exotics firſt known in our gardens. It may be treated as a hardy annual, but is beſt raiſed on a hot-bed. The *leaves* are peculiarly ſmooth, ſoft, and cool to the touch, and if not too much bruiſed, exhale a very delightful ſmell. They vary in colour, being often ſpotted with purple, and are alſo occaſionally curled, cut, or bliſtered. The very hairy *calyx* is remarkable.

O. *ſanctum.* Purple-ſtalked, or Sacred Baſil. Linn. Mant. 85. Willd. n. 12. Ait. n. 7. (Kattu-tumba; Rheede Hort. Malab. v. 10. 183. t. 92.)—Leaves rather oblong, blunt, ſerrated, wavy. Stem hairy. Bracteas heart-ſhaped.—Native of the Eaſt Indies. Said to have been introduced into this country by the late Duke of Northumberland in 1758. It is annual, and kept in the ſtove. Linnæus had an Eaſt Indian ſpecimen ſent him, as the "Sacred herb of the Bramins;" as well as ſeeds, which he raiſed at Upſal. He juſtly remarked that the herb has ſcarcely any ſmell. Dr. Buchanan thinks there is ſome error in the hiſtory of this ſpecies, the Baſil, which is really held ſacred, having a powerful odour.

O. *americanum* appears likewiſe to be involved in ſome obſcurity; that of Linn. Sp. Pl. 833, ſaid to come from America, being a much ſmaller and narrower-leaved plant than Jacquin's, Hort. Vind. v. 3. 45. t. 86, which laſt was marked by Linnæus *purpuraſcens*, but he does not appear to have deſcribed it under that name. He had a Jamaica ſpecimen from Browne.

OCIMUM, in *Gardening*, comprehends plants of the tender herbaceous aromatic annual kind, of which the ſpecies cultivated are; the common ſweet baſil (O. baſilicum); the buſh baſil (O. minimum); and the ſlender-ſpiked baſil (O. tenuiflorum).

The firſt has varieties with purple fringe-leaves; with green fringe-leaves; green with ſtudded leaves; and the large-leaved baſil.

But the middle-ſized variety, or that which is uſed in the kitchen, eſpecially in French cookery, riſes about ten inches high, ſending out oppoſite, four-cornered branches from the very bottom: the leaves are ovate-lanceolate, ending in acute points, indented on their edges. The whole plant is hairy, and has a ſtrong ſcent of cloves, which to ſome is very agreeable.

The chief ſubvarieties of which are; the common baſil, with very dark green leaves, and violet-coloured flowers; the curled-leaved baſil, with ſhort ſpikes of flowers; the narrow-leaved baſil, ſmelling like fennel; the middle baſil, with a ſcent of citron; the baſil with ſtudded leaves; and baſil with leaves of three colours.

In the ſecond ſort there are alſo varieties with black purple leaves, and with variable leaves.

*Method of Culture.*—Theſe are all capable of being increaſed by ſowing the freſh ſeeds in the latter end of March, upon a moderate hot-bed, covered to the depth of five or ſix inches with good light mould, putting them in a quarter of an inch deep, freſh air being given daily, and ſlight waterings occaſionally. When the plants have attained a few inches in growth, they ſhould be pricked out upon another hot-bed four inches apart, or ſet in pots of a ſmall ſize, plunging them in the hot-bed, water and occaſional ſhade being given till freſh rooted, with freſh air and water in ſmall proportions afterwards. In the latter part of the ſpring or beginning of ſummer, they ſhould be begun to be hardened, and in the hot weather ſet out in the open air where wanted. Some may be ſet out in the borders in the open ground, a ſlight watering being given at the time.

But in order to obtain good ſeeds, a few of the potted plants ſhould be placed in a good green-houſe, or glaſs caſe, in the latter end of the ſummer, freſh air being freely admitted.

It may be obſerved that the firſt ſort and varieties are often uſed as culinary herbs, and all the ſorts may be ſet out among other potted plants, in rooms and windows, eſpecially the buſh ſort, as well as in the borders and clumps for ornament and variety.

OCIVAS, in *Geography*, a town of Brazil, in the government of Maranhao.

OCKENHEIM, or HOKENHEIM, in *Biography*, the oldeſt and moſt venerable compoſer in parts on the conti-

nent, of whoſe works we have been able to find any remains.

M. le Duchat, in his notes upon Rabelais, ſays he was a native of Hainault, and treaſurer of St. Martin de Tours; but we believe this aſſertion was hazarded more with the patriotic view of making Okenheim as much a Frenchman as poſſible, than from proof or conviction; for he was always ſpoken of as a Netherlander by his contemporaries, Tinctor, Franchinus, and even in the "Deploration," or Dirge, written upon his death, which his ſcholar, Juſquin, ſet to muſic in five parts, as well as in the following, which was ſet by Guillaume Creſpel:

"Agricola, Verbonnet, Prioris,
Joſquin des Pres, Gaſpard, Brunel, Compere,
Ne parlez plus de joyeulx chants, ne ris,
Mais compoſez un *ne recorderis*,
Pour lamenter noſtre maiſtre et bon pere."

There is ſtill another dirge, in Latin, on the death of Okenheim, ſet to muſic by Lupi, a Netherlander, and compoſer of eminence in the time of the emperor Charles V. Many of whoſe Latin motets, and French ſongs, in parts, are preſerved in the muſeum collections, as are thoſe of Creſpel, the compoſer of the French "Deploration," juſt cited.

Little more is recorded concerning the life of Okenheim, than that he was a Netherlander, who flouriſhed in the fifteenth century, produced many learned and elaborate compoſitions for the church, and had many ſcholars, by whom he ſeems to have been much beloved and reſpected. It is, indeed, often mentioned to his honour, that he was the maſter of Juſquin: but he ſeems to have been as fortunate in a diſciple, as Juſquin in a maſter: as no great profeſſor is ſure of making great ſcholars in any art, unleſs he have genius and diligence to direct; and it is only from ſuch fortunate and rare concurrences that the narrow limits of mediocrity are ſurpaſſed, or the wild effuſions of youthful ardour reſtrained.

None of the muſical writers of the ſixteenth century forget to tell us that Okenheim compoſed a motet in thirty-ſix parts: of what theſe parts conſiſted, or how they were diſpoſed, is not related by Ornithoparcus, Glareanus, Zarlino, or any one who mentions the circumſtance, which all ſeem to have received from tradition. But of our countryman, Bird, a ſong is ſtill preſerved in forty parts; yet though we have ſeen this effort of ſcience and labour, the effects muſt ſtill be left to imagination, for where ſhall we find forty voices, aſſembled together, that are able to perform it.

We may, however, deduct from the reputation of Okenheim all the increaſe it received from the ſtory of his Polyphonic compoſition, and there will ſtill remain ſufficient cauſe for the reſpect and wonder of contrapuntiſts, in the fragments only of his works which have been preſerved in the "Dodecachordon" of Glareanus. This writer tells us, that he was fond of the Καθολικα in the cantus; that is, of compoſing a melody which may be ſung in various modes, or keys, at the pleaſure of the performer, obſerving only the ratio or relation of conſonant notes in the harmony.

Okenheim likewiſe compoſed a maſs for three and four voices, *ad omnem tonum*, which, as the words imply, might be ſung in any of the three ſpecies of diateſſaron, each part beginning at *ut*, *re*, *mi*, or in *c*, *f*, *g*, major, and *d*, *e*, *a*, minor, on which account no indicial clef is marked; as the performer, at ſetting off, has his choice of any of the modes, or eccleſiaſtical keys. Indeed all the fragments from Okenheim are inſerted in Glareanus, without bars, clefs, or accidental flats and ſharps.

It is not certain when Okenheim died, but he is generally mentioned as a compoſer of the fifteenth century, and we have met with no proof of his exiſting in the next.

OCKER, in *Geography*, a river which riſes by ſeveral ſprings in the Hartz foreſt, about 8 miles S.E. from Goſlar, and after paſſing by Wolfenbuttle, Brunſwick, &c. runs into the Aller, 5 miles W. of Gifhorn.

OCKLEY, Simon, in *Biography*, a diſtinguiſhed oriental ſcholar, was born at Exeter in 1678. He was entered of Queen's college, Cambridge, in 1696, where he applied himſelf very aſſiduouſly to the ſeveral branches of literature, and eſpecially to the oriental languages. Having taken orders, he was preſented to the living of Swaveſey, in Cambridgeſhire, and in 1711 was choſen profeſſor of Arabic in that univerſity. He married while young, and the expences of a growing family involved him in debt, for which he was thrown into confinement among the debtors in Cambridge caſtle, whence he dates one of his works in the year 1717. It is not known by what means he obtained his liberty, but he did not live long to enjoy it, dying in 1720. He diſplayed his zeal for promoting the ſtudy of Eaſtern literature, in a publication entitled "Introductio ad Linguas Orientales," dedicated to the biſhop of Ely, and addreſſed to academical youth, with an exhortation to purſue a branch of learning, without which, he ſays, no one ever became a great divine. The moſt conſiderable work of this learned author was his "Hiſtory of the Saracens," from 632 to 705, in two volumes octavo; the firſt was publiſhed in 1708, and the ſecond in 1718, while he was in priſon. This is a valuable work, and contains much curious and entertaining information, reſpecting the religion, manners and cuſtoms of the Saracens, of which a great part was new at the time when he wrote. In 1707 he publiſhed a tranſlation from the Italian of "The Hiſtory of the Preſent Jews throughout the World by Leo Modena, a Venetian Rabbi;" and in the following year he gave a tranſlation from a curious work entitled "The Improvement of Human Reaſon, exhibited in the Life of Hai Ebn Yokdhan, written by Abu Jaafar Ebn Tophail." Biog. Brit.

OCLISSER, in *Geography*, a town of Hindooſtan, in Guzerat, on the S. ſide of the Nerbuddah, oppoſite to Baroach.

OCOCOLIN, in *Ornithology*. See Tetrao *Nævius*.

OCOL, in *Geography*, a town of Thibet; 80 miles W.N.W. of Cha-tcheou.

OCONA, a town and port of Peru, near the coaſt of the Pacific ocean, in the dioceſe of Arequipa; 96 miles W.N.W. of Arequipa. S. lat. 16°.

OCONEE, a river of America, which is the N. main branch of Alatamaha river, in the ſtate of Georgia, in many places 250 yards wide; its banks abound with oak, aſh, mulberry, hickory, black walnut, elm, faſſafras, &c.—Alſo, a town on the E. bank of the fore-mentioned river; 62 miles W. by N. from Auguſta.

OCOPA, a town of Peru, in the juriſdiction of Atun Xauxa.

OCOQUAN, a river of America, in Virginia, which, after a ſhort courſe, diſcharges itſelf into Patowmack river, five miles below Colcheſter, N. lat. 39° 39'. W. long. 77° 18'.

OCORONI, a town of New Mexico, in the province of Cinaloa; 12 miles N. of Cinaloa.

OCOTEA, in *Botany*, a name of Aublet's, of whoſe origin or meaning we have no account. It can ſcarcely have

been manufactured out of *Ajou-hou-ha*, the Caribean appellation of the fine tree to which it belongs. See POROSTEMA.

OCOTZINITZAN, in *Ornithology*. See ORIOLUS *Annulatus*.

OCOZINGO, in *Geography*, a town of Mexico, in the province of Chiapa; 40 miles E. of Chiapa dos Eſpagnols.

OCREA, among the *Ancients*, a kind of military ſhoe, or ſhort boot, which was made of white tin, and ornamented with gold or ſilver, about the ankles. Its uſe was very ancient; the Greeks were ſo well provided with them in Homer's time, that he thence gives them the appellation of ἐυκνημιδες Αχαιοι. Among the Romans, none were allowed to wear the *ocreæ*, but the two upper claſſes of the people, or ſuch whoſe eſtate exceeded 7500 drachmas.

OCRECOCK INLET, in *Geography*, a navigable inlet, though dangerous without a pilot, on account of its bars and ſhoals of ſand, on the coaſt of North Carolina, leading into Pamlico ſound, and out of it into Albemarle ſound, through which all veſſels muſt paſs that are bound to Edenton, Waſhington, Bath, or Newbern. N. lat. 35° 10′.

OCRIDA. See AKRIDA.

OCRINUM, in *Ancient Geography*, a promontory of the iſle of Albion, which was undoubtedly the Lizard point in Cornwall, probably called Ocrinum, from Och Rhen, a high promontory; and as the Britons kept poſſeſſion of Cornwall ſo long, we need not be ſurpriſed that the preſent name of that promontory, the Lizard, is alſo of Britiſh derivation, from Lis-ard, a lofty projection.

OCROPHUS, in *Ornithology*. See TRINGA *Ochropus*.

OCRZKA, in *Geography*, a town of Poland, in the palatinate of Lublin; 26 miles N.W. of Lublin.

OCTABIS, in *Law*. See OCTAVE.

OCTACHORD, an inſtrument or ſyſtem of muſic, compoſed of eight ſounds, or ſeven degrees. The *octochord*, or lyre of Pythagoras, comprehended the eight ſounds expreſſed by theſe letters, E, F, G, a, b, c, d, e: that is to ſay, two disjunct tetrachords.

OCTAETERIDES, formed from οκταετηρις, compoſed of οκτω, *eight*, and ετος, *year*, in *Chronology*, &c. the ſpace or duration of eight years.

OCTAETERIS, οκταετηρις, in *Antiquity*, a cycle, or term of eight years, at the end of which three entire lunar months were added. This cycle was in uſe till Meton, the Athenian, reformed the calendar, by finding out the golden number, or cycle of nineteeen years. See CALENDAR and CYCLE.

OCTAETIS, in *Natural Hiſtory*, a name given by Linnæus, and many other authors, to a kind of ſtar-fiſh of the aſtrophyte claſs, the rays of which are eight in number, where they firſt part from the body, but ſoon divide into many more.

OCTAGON. See OCTOGON.

OCTAHEDRON, or OCTAEDRON, in *Geometry*, one of the five regular bodies; conſiſting of eight equal and equilateral triangles.

The octahedron may be conceived as conſiſting of two quadrilateral pyramids put together at their baſes.

Its ſolidity, therefore, is had, by multiplying the quadrangular baſe of either by one-third of the perpendicular height of one of them, and then doubling the product. The ſquare of the ſide of an octahedron is in a ſubduple ratio of the ſquare of the diameter of the circumſcribing ſphere. See REGULAR *Body*.

OCTANDRIA, in *Botany*, the eighth claſs in the Linnæan artificial ſyſtem, and ſo named from the flowers which belong to it having eight ſtamens, in the ſame flower with the piſtil or piſtils. The orders are four. 1. *Monogynia*, a very various and rich one, containing *Epilobium*, *Fuchſia*, *Erica*, *Vaccinium*, *Daphne*, and ſeveral other intereſting plants. 2. *Digynia*, a very ſmall order; ſee MOEHRINGIA. 3. *Trigynia*, chiefly remarkable for *Polygonum*, which however is not conſtant in the number of either ſtamens or ſtyles. 4. *Tetragynia*, in which we find two curious Britiſh plants, the *Paris* and *Adoxa*.

OCTANT, or OCTILE, in *Aſtronomy*, an aſpect or poſition of two planets, &c. wherein their places are diſtant by an eighth part of a circle, or 45 degrees from one another. See ASPECT.

OCTAPLA, formed from οκτω, *eight*, q. d. *ſomething with eight rows* or *columns*, a term in the ſacred learning, uſed for a kind of ancient Polyglot bible, conſiſting of eight columns.

In the firſt column was the Hebrew text, in Hebrew characters; in the ſecond, the ſame text in Greek characters; in the third, the Greek verſion of Aquila; in the fourth, that of Symmachus; in the fifth, the Septuagint; in the ſixth, that of Theodotion; in the ſeventh, that called the *fifth*; the laſt was that called the *ſixth*.

Origen was the author of the octapla, as well as of the tetrapla and hexapla.

OCTARARO CREEK, in *Geography*, a river of America, in Pennſylvania, which runs into the Suſquehanna, N. lat. 39° 40′. W. long. 76° 12′.

OCTATEUCH, in the *Sacred Literature*, is uſed for the eight firſt books of the Old Teſtament, *viz.* Geneſis, Exodus, Leviticus, Numbers, Deuteronomy, Joſhua, Judges, and Ruth. Procopius of Gaza has ten commentaries on the Octateuch.

OCTAVE, the firſt and moſt perfect of concords in *Muſic*, in the order of their being generated by the harmonies of a ſingle ſtring; after the uniſon, it is that among all the ſounds of which the ratio is moſt ſimple. The uniſon is in the ratio of equality, the coincidence of the pulſations happening together; that is, as 1 to 1. The octave is in the double ratio, that is, as 1 to 2. The harmonies of the two ſounds reciprocally agree without exception, which does not happen in any other interval. In ſhort, theſe two ſounds (uniſon and octave) have ſuch an affinity and reſemblance, that they are often confounded in the melody, and in the harmony even one is indifferently taken for the other. When a child or a woman ſeems to be ſinging in uniſon with a man, they are conſtantly ſinging in octaves. This interval is called octave, or eighth, becauſe in aſcending diatonically there are ſeven degrees and eight different ſounds. The following are the properties which ſo ſingularly diſtinguiſh the octave from all other intervals.

I. The octave includes within its limits all the primitive and original ſounds; ſo that after having eſtabliſhed a ſyſtem or ſeries of ſounds in the extent of the octave, if we continue the progreſſion, it muſt be done in a ſecond octave by a ſimilar ſeries, and of a ſecond and third or more octaves, where no ſound will occur, which is not a recurrence of ſome one of the firſt ſeries; and ſuch a ſeries is called the ſcale of muſic in the firſt octave, and replicates or recurrences in all the reſt. (See SCALE and REPLICATE.) It is by virtue of this property of the octave, that it has been called *diapaſon* by the Greeks. See DIAPASON.

II. The octave further embraces all the conſonances and all their differences, that is, all the ſimple concords and diſcords, and, conſequently, all harmony. If we eſtabliſh all the conſonances upon the ſame fundamental ſound, we ſhall have the following table:

120 100 96 90 80 75 72 60
120 120 120 120 120 120 120 120

which amounts to this:

1. $\frac{5}{6}$ $\frac{4}{5}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{5}{8}$ $\frac{3}{6}$ $\frac{1}{2}$,

where all the concords are found in the following order: the third minor, the third major, the fourth, the fifth, the ſixth minor, the ſixth major, and laſtly, the octave.

By this table it is manifeſt, that the ſimple concords are all contained between the octave and uniſon. They may even be heard all at once in the compaſs of an octave without any mixture of diſcords. Strike at the ſame time theſe four ſounds, C E G c, in mounting from the loweſt ſound to its octave, and they will form all the concords, except the major ſixth, which is compounded; and will form no other interval. Take any two of theſe ſounds you pleaſe, and the interval will be always conſonant. It is from this union of all the concords, that the chord which they produce is called the *common* or *perfect chord*.

The octave giving all the concords, conſequently gives all the ſhades or differences, and by that means all the ſimple intervals of our muſical ſyſtem; which are but deviations. The difference of the third major and the third minor gives the minor ſemitone; the difference of the third major and the fourth, the major ſemitone; the difference of the fourth and fifth gives the tone major; and the difference of the fifth and ſixth major gives the minor tone. Now the ſemitone minor and the ſemitone major, the tone minor and the tone major, are the only elements of all the intervals of muſic.

III. Every conſonant ſound with one of the terms of the octave, is conſonant alſo with the other; conſequently, every diſſonant ſound with one is diſſonant with the other.

IV. Finally, the octave has ſtill this property, the moſt ſingular of all, that it may be doubled, tripled, and multiplied at pleaſure, without changing its nature, and without ceaſing to be a perfect concord.

This multiplication of the octave, as well as its diviſion, is however bounded with reſpect to the powers of our organ of hearing; and an interval of eight octaves exceeds our appreciation. (See COMPASS.) The octaves even loſe ſomething of their ſweetneſs, by being multiplied; and when a certain meaſure is paſſed, all the intervals become leſs eaſy for the ear to ſeize; a double octave even becomes leſs agreeable than a ſingle; a triple than a double: in ſhort, at the fifth octave, the extreme diſtance of the ſounds robs conſonance of almoſt all its charms. It is from the octave that we draw the order of all intervals by harmonic diviſions and ſubdiviſions. Divide the octave harmonically 3 6 by the number 4, and you will have on one ſide the fourth 3 4, and on the other the fifth 4 6. Divide in the ſame manner the fifth 10 15 harmonically, by the number 12, and you will have the minor third 10 12, and the major third 12 15. Laſtly, divide the major third 72 90, and the tone major 80 90, or 8 9, &c. It ſhould be remembered, that theſe harmonical diviſions give two unequal intervals, of which the leaſt is the grave and the greateſt the acute. That if we make the ſame diviſions in arithmetic proportion, we ſhall have the ſmalleſt interval in the acute and the greateſt in the grave. Thus the octave 2 4, divided arithmetically, will firſt give the fifth 2 3 in the grave, then the fourth 3 to 4 in the acute. The fifth 4 6 will firſt give the major third 4 5; then the minor third 5 6, and ſo on. We ſhall have the ſame ratios in a contrary ſenſe, if, inſtead of taking them as we have juſt done, by the vibrations, we ſhould calculate from the length of the ſtrings. Theſe diſcoveries, indeed, are of little uſe in themſelves on keyed inſtruments, but they are neceſſary to the peruſal of old authors. The complete and rigorous ſyſtem of the octave is compoſed of three major tones and two minor. The tempered ſyſtem is compoſed of five equal tones, and two ſemitones, forming altogether as many diatonic degrees upon the ſeven ſounds of the gammut, till arrived at the octave of the generator or firſt ſound. But as each tone may be divided into two nominal ſemitones, the ſame octave divides itſelf alſo chromatically into twelve intervals of a ſemitone each, of which the ſeven preceding keep their names, and the five others take the name of the next diatonic ſound below by a ſharp and above by a flat. See SCALE.

We do not ſpeak here of diminiſhed or ſuperfluous octaves, becauſe this interval admits of no alteration either in the melody or harmony.

It is forbidden in compoſition to admit of two ſucceſſive octaves between two different parts, eſpecially by ſimilar motion; but that is admitted, and with an elegant effect, when done with deſign and propriety through a whole air or period: thus, in many concertos all the ripieno parts play in octaves or uniſons.

OCTAVE, concerning the règle de l'octave, ſee RÈGLE or RULE.

OCTAVE, *Diminiſhed*. See DIMINISHED *Octave*, and INTERVAL.

OCTAVE, or *Octabis*, in *Law*, denotes the eighth day after any feaſt, incluſively; which ſpace is alſo called *utas*.

OCTAVE, among the Romaniſts, is uſed for the ſpace or period of eight days allowed for the celebration of a feaſt, or ſervice, in commemoration of ſome ſaint, or on other ſolemn occaſions.

Eaſter, Whitſuntide, St. John Baptiſt, St. Laurence, Epiphany, the Dedication, &c. are celebrated with octaves. The office in the octave is ſemi-double.

OCTAVIA, in *Biography*, a Roman lady diſtinguiſhed for her virtues and accompliſhments, was the daughter of Caius Octavius, the father of the emperor Auguſtus. Suetonius indeed ſays, ſhe had the ſame mother with that emperor, but according to Plutarch, ſhe was the daughter of a former wife of Octavius. She was accordingly either ſiſter or half-ſiſter to the emperor. She was firſt married to Claudius Marcellus, by whom ſhe had two children before his death, which happened a little after the war of Perſia, when ſhe was pregnant of a third child. After this ſhe married the triumvir Mark Antony, as the medium of reconciliation between him and her brother. At this time ſhe was extremely beautiful, univerſally reſpected and eſteemed, and tenderly beloved by her brother. Antony had previouſly to this been captivated by the allurements of Cleopatra, but the merits of Octavia appeared to make a proper impreſſion upon him, and he paſſed ſome time in conjugal union with her, during which ſhe bore him two daughters. She accompanied him into Greece, and had a ſecond opportunity of reſtoring concord between her huſband and brother. She returned to Rome, while Antony went into the Eaſt; then it was, ſays Plutarch, "that the worſt of all diſeaſes, love, and the love of Cleopatra, which had lain ſo long dormant in his breaſt, and ſeemed to have given place to the temperate duties of life, upon his approach to Syria, gathered ſtrength, and broke out into a flame:" he had another interview with her, which rivetted his fetters, and ſealed his fate. Octavia was ſoon apprized of his infidelity, but determining he ſhould have no pretence for his miſconduct, reſolved to omit no duty that became her ſituation as his wife: ſhe collected conſiderable ſupplies for the war, in which he was engaged, and ſailed with



them

them to Athens. Here ſhe received the mortifying and diſtreſſing orders to advance no farther. Deſpairing now of a renewal of his affection, ſhe returned to Rome. Auguſtus, extremely enraged at this treatment of a beloved ſiſter, wiſhed to perſuade her to retire from the world. But ſhe refuſed to quit her huſband's houſe, and preſerving the dignity of her ſtation, devoted herſelf to the education of her children, beſtowing no leſs care on thoſe of Antony by Fulvia, than ſhe did upon her own. She readily and liberally entertained all her huſband's friends who were ſent to Rome on buſineſs, and uſed her beſt endeavours to promote his intereſt. His attachment, however, to Cleopatra rendered him inſenſible to her kindneſs; he ſolemnly divorced her and married Cleopatra. The Roman people were not leſs indignant than her brother at this profligate conduct, which Octavia herſelf, we are informed, chiefly lamented on this account, that ſhe ſhould become one of the cauſes of a civil war. After the death of her unfeeling huſband, ſhe even undertook the care of his children by Cleopatra, and married the daughter to Juba, king of Mauritania. Her own ſon Marcellus lived to be the hope of the empire, and was conſidered as the heir of Auguſtus, but his untimely death threw the mother into a ſtate of dejection, bordering upon abſolute deſpair, from which ſhe never recovered. The effect upon her of Virgil's beautiful lines, in the ſixth Æneid, in commemoration of that lamented youth, is highly characteriſtic of a mother's feelings. When the poet, reciting them in her preſence, came to the name, of Marcellus, artfully ſuppreſſed, to make the cloſe and climax of the paſſage, Octavia fainted away. On her recovery, ſhe expreſſed her gratitude for ſo noble an effort of genius conſecrated to her ſorrow, by a moſt munificent recompence. Octavia ſurvived the loſs of her beloved ſon about twelve years, the whole of which ſhe ſpent in mourning, refuſing that conſolation which her other children were capable of affording, and remaining in darkneſs and ſolitude. She died in the year 11 before the birth of Chriſt, and very extraordinary honours were paid to her memory by her brother and the ſenate. See the article ANTONY. Suetonius. Plutarch.

OCTAVIER, Fr. in *Muſic*. When a wind inſtrument is over blown, the tone inſtantly breaks into the octave. This is what the French verb octavier implies. In thus forcing the inſpiration, the air incloſed in the tube, and conſtrained by the outward air, is obliged to give way to the velocity of the oſcillations, and to divide itſelf into two equal columns, having each half the length of the tube; and thus each of the halves ſounds the octave of the whole. A ſtring of a violoncello, upon the ſame principle, breaks into the octave, when the ſtroke of the bow is too violent, or too near the bridge. It is one of the defects of an organ, when a pipe has too much or too ſtrong a wind to give the octave inſtead of the real ſound.

OCTAVINA, in the *Italian Muſic*, a kind of ſmall ſpinet, eaſily moved, having only one row of keys, and thoſe not to the uſual number, perhaps not more than three, the common ones extending to five. See SPINET.

OCTELINE, another appellation for the ſame diminutive kind of inſtrument.

OCTEVILLE, in *Geography*, a town of France, in the department of the Channel, and chief place of a canton, in the diſtrict of Valognes. The place contains 850, and the canton 13,303 inhabitants, on a territory of 19 kiliometres, in 17 communes.

OCTILE, in *Aſtrology*. See OCTANT.

OCTO, *Ad* OCTO. See AD OCTO.

OCTO *Tales*. See TALES.

OCTOBER, the eighth month of the year in Romulus's calendar; though the tenth in that of Numa, Julius Cæſar, &c. conſiſting of thirty-one days.

October has ſtill retained its firſt name in ſpite of all the different names the ſenate and Roman emperors would have given it. The ſenate ordered it to be called Fauſtinus, in honour of Fauſtina, the wife of Antoninus the emperor: Commodus would have had it bear the name of Inviſtus: and Domitian made it be called Domitianus, after his own name.

OCTOBLEPHARUM, in *Botany*, ſo named from οκτω, *eight*, and βλεφαρον, *the eye-laſh*, a genus of Moſſes founded by Hedwig, upon the *Bryum albidum* of Linnæus, its only known ſpecies. The plan of Hedwig's ſyſtem required the eſtabliſhment of this genus, and it happens that nature here confirms his artificial principle. (See FRINGE *of Moſſes*, and HEDWIG.) Hedw. Sp. Muſc. 50. Crypt. v. 3. 15. Bridel. Muſc. v. 2. 50. (Octoblepharis; Schreb. 758.) Claſs and order, *Cryptogamia Muſci*. Nat. Ord. *Muſci*.

Eſſ. Ch. Fringe of eight ſimple equidiſtant teeth. Capſule without an apophyſis.

1. O. *albidum*. Hedw. Crypt. faſc. 3. t. 6. f. A. (Bryum albidum; Linn. Sp. Pl. 1583. Swartz Obſ. t. 11. B. nanum, larignis foliis albis; Dill. Muſc. 364. t. 46. f. 21.) —Dillenius received this moſs from "Providence iſland in America," but from which of the two iſlands ſo named does not appear. Dr. Swartz found it in Jamaica, and we have the ſame from the Eaſt Indies, gathered by Dr. F. Buchanan. The frequent coincidence between the cryptogamic vegetables of the two Indies, is a curious circumſtance in the philoſophy of botany; as well as that between the aquatic plants of widely diſtant, and even different, climates. This is a ſmall perennial moſs, forming tufts on the trunks of trees, and remarkable for its white, rather opaque, though glittering, colour, with ſcarcely a tinge of green, in which reſpects it agrees with our *Dicranum glaucum*, and the *Sphagnum*, or Bog-Moſs, abſorbing moiſture, like them, with the greateſt rapidity, though ever ſo long dried. The *leaves* are linear, ſomewhat ſpatulate, entire, ſpongy, without any rib, ſpreading in every direction, ſcarcely half an inch long. *Anthers* red, in axillary tufts, ſurrounded by four leaves. *Capſules* on the ſame plant, axillary, elliptical, ſmooth, pale brown, their ſtalks about half an inch long, erect. *Lid* conical, acute, ſhorter than the capſule. *Fringe* reddiſh-brown, its teeth broad at the baſe, ſhort, acute.

OCTOGON, or OCTAGON, in *Geometry*, a figure of eight ſides, and eight angles.

When all the ſides and angles are equal, it is called a *regular* octogon, or an octogon that may be inſcribed in a circle.

To make an octogon on a given line A B. Erect A F and B E (*Plate* X. *Geometry*, *fig.* 8.) perpendicular to A B: produce A B both ways, and biſect the angles *m* A F and *n* D E with the lines A H and B C, each equal to A B: draw C D and H G parallel to A F or B E, and each equal to A B: with the radius A B, and on the centres G and D, deſcribe arcs interſecting A F and D E in F and E: then join G F, F E, E D, and A H G F E D C B is the figure required. In or about a given circle, to deſcribe a ſquare, or an octogon; draw two diameters, A B, C D, perpendicular to each other; then connect their extremities, and we ſhall have the inſcribed ſquare A C B D: alſo through their extremities draw tangents parallel to them, and they will form the outer ſquare *m n o p*. If any quadrant, as A C, be biſected in *q*, it will give one-eighth of the circum-

circumference, or the ſide of the octogon. To find the area of an octogon, ſee POLYGON.

OCTOGON, in *Fortification*, denotes a place that has eight baſtions. See BASTION.

OCTOPHORUM, among the *Ancients*, a carriage with eight wheels.

It alſo ſignified a chair, or litter, *lectica*, carried by eight chairmen, which kind of chair was moſtly uſed by the women.

OCTOPITARUM, in *Ancient Geography*, a promontory of Albion, which is evidently St. David's Head in Pembrokeſhire.

OCTOSPORA, in *Botany*, from οκτω, *eight*, and σπορος, *a ſeed*, a genus of *fungi* eſtabliſhed by Hedwig, of which he gives the following character, in his Crypt. v. 2. 4.

"Trunk perfectly ſimple, terminated by a fertile ſurface, which is either concave, flat, or reflexed; and out of which proceed very numerous, elongated, delicately membranous ſeed-caſes, generally ſurrounded with a filamentous ſubſtance, not connected among themſelves, each of them producing eight ſeeds."

Schreber adopts this genus, in his Gen. 770, but the profeſſed writers on *Fungi*, though uſually ſo prolific in genera, entirely neglect this, retaining the plants which compoſe it in the eſtabliſhed genus of *Peziza*, to which they properly belong. Indeed the character of the ſeeds and their caſes is exactly the ſame as in the old genus *Lichen*, or rather in nearly the whole of the natural order of LICHENES; ſee that article. We do not mean that this would be any objection to its diſtinguiſhing a genus of *Fungi*, having no other character in common with the *Lichenes*, were it wanted for that purpoſe. See PEZIZA.

OCTOSTYLE, in the *Ancient Architecture*, the face of a building, or ordonnance, containing eight columns.

The eight columns of the octoſtyle may either be diſpoſed in a right line, as in the Pſeudodiptere temple of Vitruvius, and in the Pantheon; or in a circle, as in the round Monoptere temple of Apollo Pythius at Delphi, &c.

OCTUNX, a word uſed by ſome diſpenſatory writers to ſignify eight ounces.

OCULATA, in *Ichthyology*, a name given by many to the fiſh more uſually called *melanurus*. It has the name *oculata*, from the remarkable largeneſs and fine golden iris of its eye. See SPARUS *Melanurus*.

OCULATUS LAPIS, the *Eyed-ſtone*, in *Natural Hiſtory*, a name given by Mercatus, in his "Metallotheca Vaticana," and, by many other writers, to what we call the *pudding-ſtone*, a ſtone formed of a great number of pebbles, of a ſmall ſize, immerſed, and formerly bedded in a flinty cement, little leſs hard than the ſtones themſelves, and in ſome ſpecies not at all ſo. The reſemblance of theſe round pebbles, when the maſs was cut, to the eyes of animals, probably gave origin to this name.

OCULI, EYES, in *Botany*, the gemmæ or buds of a plant juſt putting forth, or the knots out of which thoſe buds ariſe.

OCULI, *Abductor*, *Depreſſor*, *Elevator*, and *Obliquus*, in *Anatomy*. See the reſpective articles.

OCULI *Speculum*. See SPECULUM.

OCULIST is a name appropriated to a ſurgeon, who applies himſelf particularly to the ſtudy and cure of diſeaſes of the eye.

OCULO-MUSCULARES, in *Anatomy*, the nerves of the third pair, which ſupply the muſcles of the eyes. (See NERVE.) It is alſo called motor oculi.

OCULUS. See EYE.

OCULUS *Beli*, in *Natural Hiſtory*, the name of one of the ſemi-pellucid gems of the genus of the Hydrophanæ, or the greyiſh-white hydrophanes variegated with yellow, and with a black central nucleus.

It is a very elegant and beautiful gem; its baſis, or ground, is a whitiſh-grey, variegated with yellow, and ſometimes with red, and a little black, but that more rarely, and is found in ſmall maſſes from half an inch to an inch in diameter; of a rounded figure, and thickeſt in the middle, tapering away gradually to the ſides; the outer part of the ſtone, or that towards the edges all round, is ever of a whitiſh-grey, more or leſs variegated with yellow, &c. and its central nucleus is always of a deep and fine black, ſurrounded by a broad circle, of a pale yellow, and repreſenting very beautifully the pupil and iris of the eye; theſe are encloſed in the matter of the ſtone, and are often ſurrounded by other very fine concentric circles, of a pale flame-colour; but more frequently there is only the black pupil, ſurrounded by the yellow iris, and that placed in the body of the ſtone which repreſents the white of the eye; the ſhape of the ſtone alſo favours its reſemblance of an eye, and the whole is very elegant. It is of the hardneſs of the agate, and takes a tolerable poliſh; when thrown into water, it has, in a great meaſure, the property of the oculus mundi, the whole ſtone becomes greatly more bright and lucid, and the grey part becomes of a plainly yellowiſh caſt.

There are many things improperly called oculus beli by our jewellers, but the genuine ſpecies is very rare. Nothing is more common than to find in the agates little circular veins of different colours round a central ſpot; theſe the lapidaries frequently cut out, with a proper quantity of the ſtone about them, and call them oculus beli. They are not peculiar to the agate, but are common alſo in the cornelian, and ſtand ſometimes ſingle, ſometimes two or three together, and according to the colours of the circles, repreſent the eyes of various animals. See GEM.

OCULI *Cancrorum*. See CRAB'S *Eyes*.

OCULUS *Cati*. See ASTERIA and GEM.

OCULUS *Chriſti*, in *Botany*, a name given to a ſpecies of clary, from the ſuppoſed virtues of its ſeeds in clearing the ſight, which it does by its viſcous covering; for when any thing happens to fall into the eye, if one of theſe ſeeds is put into one corner, and the eye-lid kept cloſe over it, moving the ſeed gently along the eye, whatever happens to be there will ſtick to the ſeed, and ſo be brought out.

OCULUS *Leporinus*, a diſtemperature of the eyes, called alſo *ectropium*.

OCULUS *Marinus*, the *ſea-eye*, a name given by ſome authors to the umbilicus marinus, from its reſemblance to the ſhape of an eye.

OCULUS *Mundi*, in *Natural Hiſtory*, the name of one of the ſemi-pellucid gems of the genus of the Hydrophanæ. It is of one plain and uniform colour, which is a whitiſh-grey, and has no veins, or other variegations. It is found in ſmall maſſes, of the ſhape of our common flints and pebbles; it has but a very obſcure degree of tranſparence, and is not capable of a fine poliſh. This ſtone, however, though of little beauty, has this very ſingular property, that, when thrown into a baſon of water, in the ſpace of half a minute it begins to change its appearance, and very ſoon, inſtead of a pale grey, becomes of a very bright, and conſiderably pellucid, pale yellow, like that of amber, or the yellow cornelian; this it retains as long as it remains in the water, but as ſoon as taken out and dried, it reſumes its grey colour, and becomes as opaque as before. It is found, ſo far as is yet known, only in China; but the ſhores of ſome of our own rivers afford us ſtones coming up to its qualities

in

in ſome degree, though not ſo beautifully tranſparent in water as the oriental. See GEM (*opal*).

OCULUS *Veneris*, a name given by ſome to the umbilicus marinus.

OCUMARA, *Bay of*, in *Geography*, a bay of the province of Caraccas, in Terra Firma, South America, 5 leagues E. of Porto-Cabello, which is a very good and well-ſheltered port. It has excellent moorings; and the port is defended, on the E., by a battery mounting eight pieces of cannon. The village of Ocumara is at the diſtance of one league from the port, and is watered by a river of the ſame name, which, after fertiliſing its vallies, diſcharges itſelf into the ſame bay at the bottom of the fort. Between the bay of Ocumara and that of Guayra, are ſeveral ſmall ports, where the inhabitants of that coaſt ſhip their commodities for Guayra, or Porto-Cabello; but none of them very important. Dupons's Travels, vol. i.

OCUNHAZARY, a town of Bengal; 20 miles N.N.W. of Ramgur.

OCYMOPHYLLON, in *Botany*. See ISNARDIA.

OCYMUM. See OCIMUM.

OCZE, in *Geography*, a town of European Turkey, in Moldavia; 44 miles W.N.W. of Birlat.

OCZYCE, a town of Lithuania; 40 miles S.E. of Minſk.

ODA, in the *Turkiſh Seraglio*, ſignifies a claſs, chamber, or order.

The grand ſignior's pages are divided into five claſſes, or chambers, called *odas*. See PAGE.

The firſt, which is the loweſt in dignity, is called the *great oda*, from the number of perſons that compoſe it.

Theſe are the juniors, who are taught to read, write, and ſpeak the languages; which are, the Turkiſh for this world; the Arabic for paradiſe; and the Perſian for hell, by reaſon of the hereſy of the people that ſpeak it.

The ſecond is called the *little oda*; where, from the age of fourteen or fifteen years, the youth are trained up to arms, and the ſtudy of ſuch polite learning as the Turks are acquainted with; *viz.* logic, arithmetic, geometry, and a little aſtrology.

In each of theſe chambers is a page of the privy-chamber, who ſuperintends them, as the prefects in the colleges of the Jeſuits.

The third chamber, called *kilar-oda*, comprehends two hundred pages; which, beſides their other exerciſes, are commanded by the kilerdgi-bachi, for the ſervice of the buttery and fruitery.

The fourth only conſiſts of twenty-four; theſe, under the khazineda-bachi, take care of the treaſure in the grand ſignior's apartment, where hey never enter with any clothes on that have pockets.

The fifth is called *khas-oda*, *i. e.* privy chamber, and conſiſts of forty pages, which attend the emperor's bed-chamber. The firſt of this chamber is called *oda bachi*, the ſecond *ſiliktar*, &c.

Eight of theſe pages keep conſtant guard every night in the emperor's bed-chamber: they are poſted in ſeveral places, ſome nearer him, others farther off, according to their degrees in the chamber. They are to take care the lights, kept conſtantly in the chamber, do not glare in his eyes, and awake him; and if they find him diſturbed with any troublefome dream, to take care he be awaked by one of the agas.

ODABACHI, or ODDABASSI, an officer in the Turkiſh ſoldiery, equivalent to a ſerjeant or corporal among us.

The common ſoldiers, and janizaries, called *oldachis*, after having ſerved a certain term of years, are always preferred, and made biquelairs; and of biquelairs, in time, become odabachis, *i. e.* corporals of companies, or chiefs of certain diviſions, whoſe number is not fixed; being ſometimes ten, and ſometimes twenty.

Their pay is ſix doubles *per* month, and they are diſtinguiſhed by a large felt, a foot broad, and above a foot long, hanging on the back, with two long oſtrich feathers.

ODALIKS, ſo called from the word *oda*, ſignifying chamber, a denomination given to ſlaves attached to the ſeraglio of the grand ſignior, in contradiſtinction to thoſe ſeven, who are ſelected as his favourites, who participate moſt commonly in his pleaſures, and who ſometimes acquire no ſmall degree of influence over public affairs. Theſe are diſtinguiſhed by the appellation of "Kadeun." If one of the odaliks be pregnant, ſhe is treated with great attention: the eunuchs ſerve her with the greateſt reſpect when the ſultan has no male children: on the contrary, ſhe finds herſelf in a very critical ſituation when he has any by a ſlave in favour. She is then fortunate if ſhe eſcape by miſcarrying, as the child is ſmothered at its birth. For one of theſe odaliks to become kadeun, an honour very ardently wiſhed by all, it is neceſſary that the grand ſignior ſhould ſend one of the ſeven favourites to the old ſeraglio, the place of exile for his women who have miſbehaved or have had the misfortune to diſpleaſe.

ODAVARA, in *Geography*, a town of Japan, in the iſland of Niphon, ſituated in the gulf of Jedo; 40 miles S.S.W. of Jedo.

ODD. See EVENLY, and FOOT.

ODDENA, in *Geography*, a town of Arabia, formerly a ſplendid city, now in ruins, near Taas.

ODDER, a town of Arabia, in the province of Yemen; 12 miles S. of Wadeij.

ODE, a Greek word implying a melody or ſong. Rouſſeau.

ODE, *Oda*, from the Greek ᾠδή, *cantus*, *ſong*, or *ſinging*, in the *Ancient Poetry*, a ſong or hymn; or a compoſition proper to be ſung, and compoſed for that purpoſe; the ſinging being uſually accompanied with ſome muſical inſtrument, chiefly the lyre. See LYRIC *Poetry*.

The peculiar and diſtinguiſhing character of the ode is, that it is intended to be ſung, or accompanied with muſic; and though this diſtinction was not peculiar to any one ſpecies of poetry, becauſe muſic and poetry were coeval and originally always joined together, yet after their ſeparation, and when bards produced compoſitions in verſe that were to be recited or read, not to be ſung, ſuch poems as were deſigned to be ſtill joined with muſic or ſong, are, by way of diſtinction, called odes. It is from this circumſtance of the ode's being ſuppoſed to retain its original union with muſic, that we are to deduce the peculiar and diſcriminating qualities of this kind of poetry. Muſic and ſong naturally add to the warmth of poetry; and they juſtify a bolder and more paſſionate ſtrain than can be ſupported in ſimple recitation. From this is formed the peculiar character of the ode. Hence, ſays Dr. Blair, proceed "the enthuſiaſm that belongs to it, and the liberties it is allowed to take beyond any other ſpecies of poetry. Hence, that neglect of regularity, thoſe digreſſions, and that diſorder, which it is ſuppoſed to admit; and which, indeed, moſt lyric poets have not failed ſufficiently to exemplify in their practice. The effects of muſic upon the mind are chiefly two; to raiſe it above its ordinary ſtate, and fill it with high enthuſiaſtic emotions; or to ſoothe, and melt it into the pleaſurable feelings. Hence, the ode may either aſpire to the former character of the ſublime and noble, or it may deſcend to the latter of the pleaſant and the gay; and between theſe there is, alſo, a middle region, of the

the mild and temperate emotions, which the ode may often occupy to advantage." The ode, ſays the learned biſhop Lowth,

"With thoughts that breathe, and words that burn,"

although inferior in ſome reſpects to the epic or what are called the higher ſpecies of poetry, yields to none in force, ardour, and ſometimes even in dignity and ſimplicity. Whilſt "the epic accompliſhes its deſign with more leiſure, with more conſideration and care, and therefore probably with greater certainty,"—"the ode, on the contrary, ſtrikes with an inſtantaneous effect, amazes, and, as it were, ſtorms the affections. The one may be compared to a flame, which, fanned by the winds, gradually ſpreads itſelf on all ſides, and at laſt involves every object in the conflagration; the other to a flaſh of lightning, which inſtantaneouſly burſts forth,

"With inſtant ruin threats great Nature's frame,
And ſhoots through every part the vivid flame."

"The amazing power of lyric poetry in directing the paſſions, in forming the manners, in maintaining civil life, and particularly in exciting and cheriſhing that generous elevation of ſentiment, on which the very exiſtence of public virtue ſeems to depend, will be ſufficiently apparent by only contemplating thoſe monuments of genius, which Greece has bequeathed to poſterity." Among them we may reckon firſt and principally, and almoſt ſolely, the poems of Pindar. The nature of the ode ſufficiently expreſſes its origin: it was the offspring of the moſt vivid and the moſt agreeable paſſions of the mind, of love, joy and admiration; and accordingly it muſt have been coeval with the firſt creation of man. Sentiments correſponding to ſuch a compoſition evidently dictated the hymn which occurs in the cxlviiith pſalm; and which is moſt elegantly imitated and put into the mouth of Adam by Milton (Parad. Loſt, b. v.), who is juſtly accounted, ſays the learned prelate now cited, the next in ſublimity to thoſe poets who wrote under the influence of divine inſpiration. If we appeal to the common teſtimony of hiſtory we ſhall find that, among every people not utterly barbarous, the uſe of muſic and poetry, in the celebration of their religious myſteries, has prevailed from the firſt periods of ſociety. Plato aſſigns the firſt rank to that ſacred melody which aſſumed the form of addreſſes to the Deity, and was diſtinguiſhed by the appellation of hymns. Accordingly the Salian poems of Numa, compoſed on the firſt inſtitution of the religious rites of that wiſe and learned monarch, are the moſt ancient of any that occur in the Latin poetry; and the moſt ancient poem extant, whoſe date is aſcertained, is the thankſgiving ode of Moſes on paſſing the Red ſea; the moſt perfect in its kind, and the true and genuine effuſion of the joyful affections. Thus the origin of the ode may be traced into that of poetry itſelf, and appears to be coeval with the commencement of religion, or more properly the creation of man. The Hebrews cultivated this kind of poetry more than any other, and are allowed to have excelled in it. Hence we have the triumphal odes of Moſes, of Deborah, and of David. Sacred poetry was a principal object of ſtudy in the ſchools of the prophets, which were antecedent to the monarchy for many years, if not coeval with the republic; and young perſons thus educated celebrated the praiſes of Almighty God in lyric compoſitions, accompanied with muſic. It was, however, under the government of David, that the arts of muſic and poetry were in their moſt flouriſhing ſtate. (See HEBREW *Muſic* and HEBREW *Poetry*.) "Of all the different forms of poetical compoſition," ſays the prelate, of whoſe admirable work we here avail ourſelves, "there is none more agreeable, harmonious, elegant, diverſified and ſublime, than the ode; and theſe qualities are diſplayed in the order, ſentiments, imagery, diction and verſification. The principal beauty of an ode conſiſts in the order and arrangement of the ſubject;" nevertheleſs, "the form of the ode is by no means confined to any certain rule for the exact and accurate diſtribution of the parts. It is lively and unconſtrained: when the ſubject is ſublime, it is impetuous, bold, and ſometimes might almoſt deſerve the epithet licentious as to ſymmetry and method; but even in this caſe, and uniformly in every other, a certain facility and eaſe muſt pervade the whole, which may afford at leaſt the appearance of unaffected elegance, and ſeem to prefer nature to art. This appearance is beſt preſerved by an exordium plain, ſimple, and expreſſive; by a diſplay and detail of incidents and ſentiments riſing delicately and artfully from each other, yet without any appearance of art; and by a concluſion not pointed or epigrammatic, but finiſhing by a gentle turn of the ſentiment where it is leaſt expected, and ſometimes as it were by chance," in which latter reſpect the beſt Arabic odes are entitled to peculiar commendation.

"It is not the metre or verſification which conſtitutes this ſpecies of compoſition; for unleſs all theſe circumſtances be adverted to, it is plain that whatever be the merit of the production, it cannot with any propriety be termed an ode. Many of the odes of Horace are entirely in this form, as well as almoſt all of thoſe few which our countryman Hanmer has left behind him." "The ſentiments and imagery muſt be ſuitable to the nature of the ſubject and the compoſition, which is varied and unconfined by ſtrict rule or method. On familiar ſubjects, they will be ſprightly, florid, and agreeable; on ſublime topics, ſolemn, bold, and vivid; on every ſubject highly elegant, expreſſive, and diverſified. Imagery from natural objects is peculiarly adapted to the ode; hiſtorical common-places may alſo be admitted, as well as deſcriptions lively but ſhort, and (when it riſes to any uncommon ſtrain of ſublimity) frequent perſonifications. The diction muſt be choice and elegant; it muſt be alſo luminous, clear, and animated; it muſt poſſeſs ſome elegancies peculiar to itſelf, and be as diſtinct from the common language of poetry, as the form and faſhion of the production is from the general caſt of poetical compoſition. In this that happineſs of expreſſion, for which Horace is ſo juſtly celebrated, wholly conſiſts. A ſweetneſs and variety in the verſification are indiſpenſible, according to the nature of the language, or as the infinite diverſity of ſubjects may require." In the Hebrew ode the numbers or verſification were probably accommodated to the muſic, and agreeable to the genius of the language; but this is a circumſtance concerning which we cannot form any deciſive judgment. In every other reſpect, ſuch as the force and elegance of the language, the beauty and dignity of the ſentiments and imagery, the different graces and excellencies of order and arrangement, biſhop Lowth does not heſitate in preferring the Hebrew writers to the lyric poets of every other nation. Our learned author diſtributes all the diverſities of this ſpecies of compoſition into three general claſſes. "Of the firſt claſs, the general characteriſtic will be ſweetneſs; of the laſt, ſublimity; and between theſe we may introduce one of a middle nature, as partaking of the properties of both. The qualities which may be accounted common to all the three claſſes, are variety and elegance." To the firſt of theſe claſſes Michaelis refers the Pſalms of David. See PSALMS.

"The ſweetneſs of the Hebrew ode conſiſts in the gentle and tender paſſions which it excites; in the gay and florid imagery, and in the chaſte and unoſtentatious diction which

it employs. The paſſions which it generally affects are thoſe of love, tenderneſs, hope, cheerfulneſs, and penſive ſorrow. In the 63d pſalm, the royal prophet, ſuppoſed to be then an exile in the wilderneſs, expreſſes moſt elegantly the ſentiments of tenderneſs and love. The voice of grief and complaint is tempered with the conſolations of hope in the 80th pſalm; and the 92d conſiſts wholly of joy, which is not the leſs ſincere, becauſe it is not exceſſive. The ſweetneſs of all theſe, in compoſition, ſentiment, diction, and arrangement, has never been equalled by the fineſt productions of all the Heathen muſes and graces united." Other pſalms particularly entitled to notice and commendation for their peculiar and diſcriminating excellencies, are the 23d, the 65th, the 72d, and the 133d. This latter is produced by our author as a ſpecimen, expreſſive of the true lyric form and character, and compreſſing in a ſmall compaſs all the merits and elegance incidental to that ſpecies of compoſition. "It is," he ſays, "if I may be allowed the expreſſion of a very polite writer,

> "A drop of Helicon, a flower
> Cull'd from the Muſe's favourite bower."
> Callimach. Hymn. in Apoll. v. 112.

This pſalm is one of the fifteen which are entitled "Odes of the Aſcenſions;" that is, which were ſung when the people *came* up either to worſhip in Jeruſalem at the annual feſtivals, or perhaps from the Babyloniſh captivity. The *return* is certainly called "the *aſcenſion* or *coming up* from Babylon." Ezr. vii. 9.

One of the grand diviſions of the order of poems now under conſideration, which is conſtituted by that middle ſtyle of compoſition, to which we have above referred, may include both thoſe lyric compoſitions, in which ſweetneſs and ſublimity are ſo uniformly blended, that every part of the poem may be ſaid to partake equally of both; and thoſe, in which theſe qualities ſeparately occur in ſuch a manner that the complexion of the poem is altogether changed and diverſified. As examples of each ſpecies we may refer to the 91ſt pſalm, which is ſuppoſed to excel the third ode of the fourth book of Horace (though juſtly celebrated), as well in grace and elegance, as in force and dignity; and the 81ſt pſalm, which affords a correct idea of this kind of poem, ſo that any one who makes himſelf maſter of its general character, genius and arrangement, will feel perfectly ſatisfied concerning the nature and form of a perfect ode. "In both theſe ſpecimens, the ſtyle and cadence of the whole poem flow in one equal and uniform tenour: but there are others, which are more changeable and diverſified, more unequal both in ſtyle and ſentiment. Theſe, though they occaſionally incline to the character of ſweetneſs, and occaſionally to that of ſublimity, may nevertheleſs, (though upon a different principle,) be properly claſſed among the odes of this intermediate ſtyle. Such are thoſe which, from a mild and gentle exordium, riſe gradually to ſublimity, both in the ſubject and ſentiments; ſuch alſo are thoſe which commence in a mournful ſtrain, and conclude with exultation and triumph. Such, in fine, are all thoſe in which the ſtyle or matter is in any reſpect diverſified and unequal. This inequality of ſtyle is perfectly conſiſtent with the nature of lyric compoſition, for variety is one of the greateſt ornaments, if not eſſentials, of the ode." (See HEBREW *Poetry*.) "The 77th pſalm will afford ſome illuſtration of what has been remarked concerning the nature and economy of the Hebrew ode. This pſalm is compoſed in what I call the intermediate ſtyle, and is of that diverſified and unequal kind, which aſcends from a cool and temperate exordium, to a high degree of ſublimity." On the other hand, the 19th pſalm is compoſed upon a different plan; "for it declines gradually from an exordium uncommonly ſplendid and ſublime, to a gentler and more moderate ſtrain, to the ſofteſt expreſſions of piety and devotion. The whole compoſition abounds with great variety, both of ſentiment and imagery."

Of the ſublimity which is characteriſtic of a third ſpecies of the Hebrew ode, and which reſults either from the plan, the order and arrangement of the poem, or from the ſentiments and the ſtyle, or from an union of all, when an aggregate perfection is produced from the beauty of the arrangement, the dignity of the ſentiments, and the ſplendour of the diction, we have examples in the 50th pſalm, the 24th pſalm, and the thankſgiving ode of Moſes, compoſed after paſſing the Red ſea (Exod. xv.) already mentioned, and the 29th pſalm. As ſpecimens of that kind of ode which derives ſublimity from ſeveral united cauſes, from the diction, the ſentiments, the form and conduct of the poem, and which accumulates, or in a manner condenſes and combines all the beauties and elegancies of this ſtyle of compoſition, we may mention the prophetic ode of Moſes (Deut. xxxii.), the triumphal ode of Deborah, the prayer of Habakkuk (ch. iii.), and the triumphal ſong of the Iſraelites on the deſtruction of Babylon (Iſaiah, xiv.)

"All odes," ſays Dr. Blair, "may be compriſed under four denominations. 1. Sacred odes; hymns addreſſed to God, or compoſed on religious ſubjects. Of this nature are the Pſalms of David, which exhibit to us this ſpecies of lyric poetry in its higheſt degree of perfection. 2. Heroic odes, which are employed in the praiſe of heroes, and in the celebration of martial exploits and great actions. Of this kind are all Pindar's odes, and ſome few of Horace's. Theſe two kinds ought to have ſublimity and elevation for their reigning character. 3. Moral and philoſophical odes, where the ſentiments are chiefly inſpired by virtue, friendſhip, and humanity. Of this kind are ſeveral of Horace's odes, and ſeveral of our beſt modern lyric productions; and here the ode poſſeſſes that middle region which it ſometimes occupies. 4. Feſtive and amorous odes, calculated merely for pleaſure and amuſement. Of this nature are all Anacreon's; ſome of Horace's; and a great number of ſongs and modern productions, that claim to be of the lyric ſpecies. The reigning character of theſe ought to be elegance, ſmoothneſs, and gaiety." Lowth's Lectures on the Sacred Poetry of the Hebrews by Gregory, vol. ii. Blair's Lectures, vol. iii.

ODE, in the *Modern Poetry*, is a lyric poem, conſiſting of long and ſhort verſes, diſtinguiſhed into ſtanzas, or ſtrophes, wherein the ſame meaſure is preſerved throughout.

The ancient ode had originally but one ſtanza, or ſtrophe; but was at laſt divided into three parts; *ſtrophe*, *antiſtrophe*, and *epode*. The prieſts going round the altar, ſinging the praiſe of the gods, called their firſt entrance *ſtrophe*, *i. e.* turning to the left; the ſecond, turning to the right, they call *antiſtrophe*, *q. d.* returning: laſtly, ſtanding ſtill before the altar, they ſung the remainder; which they called *epode*.

The odes of the ancients, Voſſius obſerves, had a regular return of the ſame kind of verſe, and the ſame quantity of ſyllables, in the ſame place of every ſimilar verſe: "But there is nothing (ſays he) but confuſion of quantities in the modern odes; ſo that, to follow the natural quantity of our ſyllables, every ſtanza will be a different ſong.

He ſhould have obſerved, however, that all the ancient odes were not of ſuch kind. But he proceeds: "The moderns have no regard to the natural quantity of the ſyllables, and have introduced an unnatural and barbarous variety

riety of long and ſhort notes, which they apply without any regard to the natural quantity of ſyllables: ſo that it is no wonder our vocal muſic has no effect." De Poem. Cantu.

Among the ancients, ode ſignified no more than a ſong; with us, they are different things. The ancient odes were generally in honour of their gods, as are many of thoſe of Pindar and Horace; ſometimes on other ſubjects, as thoſe of Anacreon, Sappho, &c. The Engliſh odes are generally compoſed in praiſe of heroes, and great exploits; as thoſe of Dryden, Prior, &c.

The diſtinguiſhing character of the ode, as we have obſerved in the preceding article, is *ſweetneſs*; the poet is to ſooth the minds of his readers by the variety of verſe, and the delicacy of words; the beauty of numbers, and the deſcription of things moſt delightful in themſelves. Variety of numbers is eſſential to the ode. At firſt, indeed, the verſe of the ode was but of one kind; but for the ſake of pleaſure, and the muſic to which they were ſung, they by degrees ſo varied the numbers and feet, that their kinds are now almoſt innumerable.

Modern lyric writers aſſume to themſelves an extravagant liberty in their verſification; they prolong their periods to ſuch a degree, they wander through ſo many different meaſures, and employ ſuch a variety of long and ſhort lines, correſponding in rhyme at ſo great a diſtance from each other, that all ſenſe of melody is utterly loſt. Whereas lyric compoſition ought, more than any other ſpecies of poetry, to pay attention to melody and beauty of ſound; and the verſification of thoſe odes may be juſtly accounted the beſt, which renders the harmony of the meaſure moſt ſenſible to every common ear.

Pindar, the great father of lyric poetry, by the boldneſs and rapidity of his flights, has been the occaſion of leading his imitators into ſome of the defects, with which they are chargeable. His genius was ſublime; his expreſſions are beautiful and happy; his deſcriptions pictureſque. Finding it, however, a very barren ſubject to ſing the praiſes of thoſe who had gained the prize in the public games, he is perpetually digreſſive, and fills up his poems with fables of the gods and heroes, that have little connection either with his ſubject, or with one another. Although he was greatly admired by the ancients, he is now ſo obſcure, partly from his ſubjects in a great degree unknown to us, and partly from his rapid and abrupt manner of treating them, that, notwithſtanding the beauty of his expreſſions, our pleaſure in reading his poems is much diminiſhed. Many of his imitators ſeem to have thought that the reſemblance of his diſorder and obſcurity was the beſt method of imbibing and indicating his ſpirit. Euripides and Sophocles, in ſeveral of their choruſes, have the ſame kind of lyric poetry with Pindar, carried on with more clearneſs and connection, and at the ſame time with much ſublimity.

"Of all the writers of odes," ſays Dr. Blair, "ancient or modern, there is none that, in point of correctneſs, harmony, and happy expreſſion, can vie with Horace. He has deſcended from the Pindaric raptures, to a more moderate degree of elevation; and joins connected thought and good ſenſe with the higheſt beauties of poetry. He does not often aſpire beyond that middle region, 'which belongs to the ode;' and thoſe odes, in which he attempts the ſublime, are not always his beſt. The peculiar character, in which he excels, is grace and elegance; and in this ſtyle of compoſition, no poet has ever attained to a greater perfection than Horace. No poet ſupports a moral ſentiment with more dignity, touches a gay one more happily, or poſſeſſes the art of trifling more agreeably, when he chuſes to trifle. His language is ſo fortunate, that with a ſingle word or epithet, he often conveys a whole deſcription to the fancy. Hence he ever has been, and ever will continue to be, a favourite with all perſons of taſte. Among the poets of later days, there have been many imitators of Horace." The moſt diſtinguiſhed is Caſimir, who wrote four books of odes; but in graceful eaſe of expreſſion, he is far inferior to the Roman: he more frequently affects the ſublime, and in the attempt, like other lyric writers, often becomes harſh and unnatural. On ſeveral occaſions, however, he manifeſts much original genius and poetical fire. Buchanan, in ſome of his lyric compoſitions, is very elegant and claſſical. "Among the French, the odes of Jean Baptiſte Rouſſeau have been much and juſtly celebrated. They poſſeſs great beauty both of ſentiment and expreſſion. They are animated, without being rhapſodical; and are not inferior to any poetical productions in the French language. In our own language we have ſeveral lyric compoſitions of conſiderable merit. Dryden's ode on St. Cecilia is well known. Mr. Gray is diſtinguiſhed in ſome of his odes, both for tenderneſs and ſublimity; and in Dodſley's Miſcellanies, ſeveral very beautiful lyric poems are to be found. As to profeſſed Pindaric odes, they are, with a few exceptions, ſo incoherent as to be ſeldom intelligible. Cowley, at all times harſh, is doubly ſo in his Pindaric compoſitions. In his Anacreontic odes he is much happier: they are ſmooth and elegant, and, indeed, the moſt agreeable, and the moſt perfect, in their kind, of all Mr. Cowley's poems." In thoſe odes, ſays Dr. Johnſon, where Cowley chooſes his own ſubjects, he ſometimes riſes to dignity truly Pindaric.

Ode, *Alcaic*. See Alcaic.

ODEH, in *Geography*, a town of Hindooſtan, in the ſubah of Agimerc; 14 miles E. of Rantampour.

ODEIDA, a town of Arabia, in the province of Yemen; 80 miles N.E. of Aden.

ODEMIRA, a town of Portugal, in Alentejo; 24 miles S.W. of Ourique.

ODENATUS, in *Biography*, king of Palmyra, was originally a native and leading inhabitant of that commercial city; though ſome make him a prince of a tribe of Saracens, who dwelt in the neighbourhood of the Euphrates. After Sapor, king of Perſia, had rendered himſelf formidable throughout the Eaſt, by the defeat of the Roman emperor Valerian, A.D. 260, he received from Odenatus a preſent of ſeveral camels laden with rich merchandize, accompanied with a ſubmiſſive letter, proteſting that he had never borne arms againſt the Perſians. Sapor was enraged that he ſhould preſume to write to him, and threatened to deſtroy him, and exterminate his whole family, unleſs he came, and, with his hands tied behind him, ſolicited forgiveneſs. Odenatus ſpurned the conditions, and collecting an army, declared for the Romans. To him is aſcribed the ſucceſs of an expedition, in which Sapor's treaſure, and ſeveral of his wives and children, were captured; and ſo cloſely did he preſs upon the Perſian, that he forced him to retreat, and cut off his rear in paſſing the Euphrates. After theſe exploits, Odenatus aſſumed the title of king of Palmyra, and elevated his wife, the celebrated Zenobia, to the rank of queen. Gallienus, the ſon and colleague of Valerian, entruſted Odenatus with the chief command of the Roman army in the Eaſt. In this quality he entered Meſopotamia, defeated Sapor in his own country, and laid ſiege to Cteſiphon. Thus he had ample opportunity of making the haughty Perſian repent of the indignity with which he had treated him. In the following diſtracted ſtate of the Roman empire, when ſuch a number of rivals to Gallienus aroſe, that the period is called that of the thirty tyrants, Odenatus

preſerved his fidelity, and kept the Eaſt in a ſtate of tranquillity. On this account he was created Auguſtus, and partner in the empire, by Gallienus, in the year 264. Zenobia was dignified with the title of Auguſta, and their children with that of Cæſar. In a ſecond incurſion into the territories of Sapor, he ravaged the country, and took the city of Cteſiphon. On his return from this expedition, he marched againſt the Goths or Scythians, who had invaded Aſia, and obliged them to make to a haſty retreat. Shortly after this he fell a victim to domeſtic treaſon, and his favourite amuſement of hunting was the occaſion of his death. His nephew, Mæonius, preſumed to throw his javelin before that of his uncle; and though admoniſhed of his error, repeated the ſame. Odenatus was provoked at this ſhow of inſolence, took away his horſe, a mark of infamy among the barbarians, and ordered the youth into confinement for a ſhort time. The offence was ſoon forgotten, but the puniſhment was remembered, and Mæonius cauſed his uncle to be aſſaſſinated in the midſt of a great entertainment. Herod, the ſon of Odenatus by a former wife, was killed with his father. This tragedy is ſaid to have been acted at Emeſſa, in the year 267. Odenatus was a prince of great qualities, and one who well merited the high rank to which he had raiſed himſelf. Univer. Hiſt. Gibbon.

ODEN-HOTUN, in *Geography*, a town of Aſia, in the kingdom of Corea. N. lat. 40° 15'. E. long. 124° 53'.

ODENKIRCHEN, a town of France, in the department of the Roer, and chief place of a canton, in the diſtrict of Crèveldt. The place contains 1627, and the canton 16,295 inhabitants, in 22 communes.

ODENSALA, a town of Sweden, in the province of Upland; 14 miles S.E. of Upſal.

ODENSEE, a town of Denmark, and capital of the iſland of Funen, ſituated on a river which runs into a large bay of the Cattegat, about a mile from the town. It is the ſee of a biſhop, and contains three churches, beſides the cathedral, and a town-houſe. A conſiderable number of ſhips trade to and from this town. The king has a palace, and in 1621 Chriſtian IV. erected a college, and liberally endowed it for four profeſſors. Odenſee ſupplies the greateſt part of the army, and eſpecially the cavalry, with all their leather accoutrements, and is particularly famous for gloves. Here are a conſiderable cloth-manufactory, a ſugar-houſe, a manufactory for ſoap, ſeveral large breweries, corn-mills, and printing-houſes. The Daniſh language is thought to be ſpoken here in its greateſt purity. The number of inhabitants is about 5000; 17 miles from Nyeborg. N. lat. 55° 4'. E. long. 10° 24'.

ODENSHOLM, a ſmall iſland in the gulf of Finland, near the coaſt of Ruſſia. N. lat. 59° 15'. E. long. 23° 15'.

ODENSWI, a town of Sweden, in Smaland; 72 miles N. of Calmar.

ODER, a river, which riſes in Moravia, about 18 miles N.E. from Olmutz, enters Sileſia and the New Mark of Brandenburg; and after paſſing by ſeveral towns, forms a large lake, called the "Friſch Haff," and ſeparating into ſeveral branches, diſcharges itſelf into the Baltic. At its mouth are two conſiderable iſlands, called Uſedom and Woldin. This river is navigable beyond Ratibor.—Alſo, a river of France, which runs into the ſea, nine miles below Quimper, in the department of the Finiſterre.

ODERBERG, a town of Brandenburg, in the Middle Mark, on the Oder; 25 miles N.W. of Cuſtrin. N. lat. 52° 56'. E. long. 14° 5'.

ODERBERG, or *Bogumin*, a town of Sileſia, in the principality of Teſchen, on the Oder; 15 miles N.W. of Teſchen. N. lat. 49° 50'. E. long. 18° 18'.

ODERLIUNGA, a town of Sweden, in the province of Schonen; 19 miles E. of Engelholm.

ODERNHEIM, a town of France, in the department of Mont Tonnerre, formerly imperial; 13 miles N.W. by W. of Worms. N. lat. 49° 45'. E. long. 8° 10'.—Alſo, a town of France, in the department of Mont Tonnerre, late in the duchy of Deux Ponts; 25 miles S.W. of Mentz. N. lat. 49° 44'. E. long. 7° 37'.

ODERQUAT, a town of the duchy of Bremen; 15 miles N. of Stade.

ODER SEIFF, a lake of Sileſia, in the principality of Breſlaw; 2 miles S. of Dyherrenfurth.

ODERZO, a town of Italy, in the Treviſan, formerly epiſcopal, the ſee of which was removed to Ceneda. It was anciently a Roman colony, called "Opiturgium," and had a port on the Adriatic, with which it communicated by the lagunes. It contains about 3400 inhabitants; 13 miles N.E. of Trevigio.

ODESCALCHI, MARC-ANTONIO, in *Biography*, a gentleman of Como, in the Milaneſe, embraced the eccleſiaſtical profeſſion, and was ordained prieſt. His relation, cardinal Odeſcalchi, afterwards pope Innocent XI., perſuaded him to come to Rome; but he refuſed all the honours which his own merit and family connection might have obtained for him, and devoted himſelf entirely to works of humanity. He ſought out and relieved poor families, who were aſhamed to beg; found employment for thoſe who were able to work; and took care of the ſick and infirm. He turned his own houſe into an hoſpital, for the reception of deſtitute foreigners of every nation indiſcriminately, and of the poor from the adjacent country. He himſelf waited upon, and inſtructed the objects of his charity, and not only lodged but clothed them. In theſe and ſuch like generous offices he employed himſelf till his death in 1670, and he bequeathed all his property for the maintenance of his hoſpital. The cardinal, his relation, took the inſtitution under his particular care; and when he became pope, rebuilt it magnificently, and enlarged it ſo as to contain 3000 beds. Moreri.

ODESPUN, or ODESPUNCK, DE LA MECHINIERE, a French prieſt, and conſiderable collector of eccleſiaſtical documents of the 17th century, was a native of Chinon in the Touraine, of the time of whoſe birth and death nothing is known. He was employed by the French clergy in forming a collection of their memoirs, which was publiſhed in two volumes, folio, in the year 1646. He alſo publiſhed "A Collection of the Councils of France, held after that of Trent," which is regarded as a decent continuation of the "Collections" of father Sirmond, in three volumes, folio; and it was ſucceeded by the "Supplement" of La Lande, in 1666. Odeſpun publiſhed alſo a work "On the Orders of Chivalry," in ſeveral volumes.

ODESSA, in *Geography*, a ſea-port town of Ruſſia, in the government of Ekaterinoſlav, on the coaſt of the Black ſea, pleaſantly ſituated near the head of a bay between the rivers Dneiper and Dneiſter, which is rendered a ſafe and convenient port, and where is formed a harbour, in which ſhips of no ſmall burden may ride ſecure from every ſtorm. A mole has been lately conſtructed, which runs nearly half a verſt into the ſea: here are other ſmaller moles, a lazaretto, &c. The roads without the port are ſafe in ſummer, and the anchorage is good. This town has ſcarcely exiſted ten years, but the population is already upwards of 10,000 perſons, and is daily increaſing. The houſes and magazines are good, and built of free-ſtone; and the ſtreets are wide, though hitherto unpaved. This place is the ſummer reſidence of the Poliſh nobility, who repair hither for the pleaſure of ſea-bathing.

bathing. The deputy-governor of the town is an Engliſhman, formerly a merchant at Naples; and the reſident merchants are reſpectable and hoſpitable. They conſiſt of perſons from various countries. Two Engliſh houſes are eſtabliſhed here, but the principal are Germans and Italians. They carry on a very conſiderable trade. In the year 1808, it is ſaid that 1000 ſhips were loaded in this port. Wheat is the only export article, but the imports are trifling. Beſides Chriſtians, the Jews form a large part of the population. N. lat. 46° 32′. E. long. 30° 38′.

ODESTAGU, a town of Sweden, in the province of Smaland; 13 miles S.S.E. of Jonkioping.

ODEUM, ωδειον, among the *Ancients*, was a place deſtined for the rehearſal of the muſic to be ſung on the theatre.

Odeum was ſometimes alſo extended to buildings that had no relation to the theatre. Pericles built an odeum at Athens, where muſical prizes were contended for: Pauſanias ſays, that Herod the Athenian built a magnificent odeum for the ſepulchre of his wife.

Eccleſiaſtical writers alſo uſe odeum for the choir of a church.

ODEYGUNGE, in *Geography*, a town of Bengal; three miles N.E. of Toree. N. lat. 23° 39′. E. long. 84° 35′.

ODEYPOUR, a town of Bengal; 13 miles W. of Palamow.—Alſo, a town of Hindooſtan, capital of Juſhpour, in the ſubah of Oriſſa; 52 miles S. of Surgooja. N. lat. 22° 36′. E. long. 83° 35′.

ODHAL, or Odel's, *Right*. Pontoppidan, in his Hiſtory of Norway, p. 290, obſerves, that in the northern languages, *odh* ſignifies *proprietas*, and *all*, *totum*. Hence he derives the *odhal* right in thoſe countries, and hence perhaps is derived the *udal* right in Finland. Now the tranſpoſition of theſe northern ſyllables *allhodh*, will give us the true etymology of the *allodium*, or abſolute property of the feudiſts; as by a ſimilar combination of the latter ſyllable with *fee*, which ſignifies a conditional reward or ſtipend, *feeodh*, or *feudum*, will denote ſtipendiary property. This cuſtom, prevalent in Norway, is a right of inheritance, by which the proprietor of freeholds may repurchaſe an eſtate which either he or any of his anceſtors have ſold, provided he can prove the title of his family. In order to enforce this right, his anceſtors, and he, muſt have declared every tenth year, at the ſeſſions, that they lay claim to the eſtate, but are unable to redeem it; and whenever he, or his heirs, acquire a ſufficient ſum, then the poſſeſſor muſt, on receiving the money, relinquiſh the eſtate to the "Odel's-man." For this reaſon, the peaſants who are freeholders keep a ſtrict account of their pedigree. This cuſtom is attended with advantages and diſadvantages. It fixes the affections of the peaſant on his native place, and he improves with pleaſure thoſe poſſeſſions which are ſo ſtrongly ſecured to him, while it increaſes the conſequence and excites the induſtry of his family. On the contrary, the eſtate loſes its value when ſold to another perſon, becauſe, as the purchaſer poſſeſſes only a precarious tenure, he is not diſpoſed to improve the lands, as if he poſſeſſed the freehold. Coxe's Travels in Norway, &c. vol. v.

ODI, in *Geography*, a town of Africa, on the Slave coaſt.

ODIHAM, a ſmall market town in the hundred of the ſame name, in the Baſingſtoke diviſion of Hampſhire, England, is ſituated 24 miles from Wincheſter, and 42 miles from London. It was formerly a free borough, belonging to the biſhops of Wincheſter. The church is an ancient and ſpacious ſtructure, built of brick: and near it is an old alms-houſe. In the population ſurvey of the year 1811, Odiham is ſtated to contain 202 houſes, occupied by 1104 perſons. The poorer claſs of inhabitants are chiefly employed in ſpinning worſted and winding ſilk. At one extremity of the town is a convenient wharf, on the Baſingſtoke canal, by which all kinds of goods are conveyed to and from London. A market is held on Fridays; and here are two annual fairs. The pariſh is very extenſive, and includes ſome of the beſt arable land in this part of the county.

At North-Warnborough, about a mile from the town, are the remains of Odiham Caſtle, the origin of which was anterior to the reign of king John, when it belonged to the ſee of Wincheſter, and became celebrated for its reſiſtance againſt the army of Lewis, dauphin of France. Here David Bruce, king of Scotland, who was made priſoner at the battle of Neville's Croſs, was confined for eleven years, and then releaſed on paying 100,000 marks, and giving hoſtages for his future conduct. The original extent and form of the caſtle cannot now be aſcertained; the fragments that remain are parts of the keep, which was an octagonal building: ſome of the ditches may yet be traced.

Nearly two miles from Odiham is Dogmersfield Park, the ſeat and property of ſir H. Mildmay, bart. The manſion is an extenſive brick building, and contains ſeveral ſpacious and elegant apartments, decorated with paintings of the Italian, Venetian, and Flemiſh ſchools. In the library is a very valuable collection of books, amounting to upwards of 5000 volumes, among which is a choice ſelection of topographical works. The park includes ſeven hundred acres of diverſified ground, and is embelliſhed with ſeveral new plantations, in addition to its woods of ancient growth. Near the houſe is a piece of water of about forty-four acres. Adjoining to the park is an extenſive common, covered with oak-trees and hollies, and in many parts bearing a ſtriking reſemblance to the New Foreſt. The archbiſhops of Canterbury had a palace at Dogmersfield as early as the twelfth century. Jocelyn Fitz-Jocelyn, who was tranſlated to that ſee in 1190, died here the following year. Some extenſive foundations, ſuppoſed to belong to this building, were recently diſcovered near the preſent manſion. Beauties of England, vol. vi. by J. Britton and E. W. Brayley.

ODILO, in *Biography*, a ſaint in the Roman calendar, a celebrated abbot of Clugny in Burgundy, was the ſon of Berault, ſurnamed the *Great*, and was born at Auvergne in the year 962. When very young he was diſtinguiſhed as well by his progreſs in learning, as by his virtuous manners. Aſpiring after a life of perfection, he determined to devote himſelf to the monaſtic profeſſion; and in the year 991, after renouncing his country and relations, he took the habit in the Benedictine abbey of Clugny. Here he quickly recommended himſelf by his literary acquirements, his exact obſervance of the inſtitutions of the order, his extraordinary piety, and the ſuperiority of his mental endowments, ſo that before he had completed his probation, the abbot deſigned him for his ſucceſſor. In the year 994 this charge devolved on him, when he was only thirty-two years of age, and he performed its duties in a manner worthy of the important truſt committed to him, and that reflected the higheſt credit on his own character and the monaſtery. The whole of the time which the duties of his ſtation did not demand, he employed in devotion and ſtudy, and from what he left behind him it appears that the ſacred ſcriptures occupied a due ſhare of his attention. The reputation which the monaſtery of Clugny acquired by his diſcipline, doctrine,

doctrine, and the ſanctity of his manners, rendered it the moſt celebrated of any one in France, or any of the adjoining countries, and induced the moſt exalted perſonages to cultivate the acquaintance of the abbot. The emperor Henry, in particular, uſed frequently to ſend for him to court, in order that he and his empreſs Adelaide might be delighted and benefited by his converſation. Hugh Capet, Robert, and Henry, kings of France, ſeveral of the kings of Burgundy and Navarre, and Caſimir, king of Poland, kept up a correſpondence with Odilo, to whom they ſent frequent preſents in teſtimony of their veneration for his character. The emperor, in token of his high regard, even ſent him his crown of gold, which he ſold in a time of general and very great ſcarcity, in order to provide for the deſtitute poor. His ſpirit was, however, ſo thoroughly diſciplined to habits of virtue, that the flattering attentions of the great did not at all miniſter to his pride. On the contrary, ſo great were his modeſty and humility, that he declined accepting the archbiſhopric of Lyons, when offered him in the handſomeſt way, and preſſed upon him by pope John XIX. He died at Souvigny in 1048, in the eighty-ſeventh year of his age. This abbot was the founder of the annual ſervice of the church of Rome in commemoration of the dead. He was author of ſeveral works, particularly of the Lives of St. Mayeul; St. Adelaide the empreſs, conſort to the emperor Otho I.; Sermons; Letters, &c. His works were collected together and publiſhed by Ducheſne, in his "Bibliotheca Cluniacenſis," and thence copied into the 17th volume of the Bibliotheca Patrum. Moreri.

ODIN, in *Mythology*, called alſo in the dialect of the Anglo-Saxons *Woden*, or *Wodan*, a name given by the ancient Scythians to their ſupreme god, and aſſumed, about 70 years before the Chriſtian era, by Sigge, a Scythian prince, who conquered the northern nations, made great changes in their government, manners, and religion, enjoyed great honours, and had even divine honours paid him. According to the account given of this conqueror by Snorro, the ancient hiſtorian of Norway, and his commentator Torſæus, Odin was a Scythian, who withdrew himſelf, with many others in his train, by flight, from the vengeance of the Romans, under the conduct of Pompey: and having officiated as prieſt in his own country, he aſſumed the direction of the religious worſhip, as well as the civil government, of the nations which he conquered. Having ſubdued Denmark, Sweden, and Norway, he retired to Sweden, where he died. There is nothing certain in this account; but it is probable, that the god, whoſe prophet or prieſt this Scythian pretended to be, was named Odin, and that the ignorance of ſucceeding ages confounded the deity with his prieſt, compoſing out of the attributes of the one, and the hiſtory of the other, the character of the northern conqueror. He deluded the people by his enchantments and ſkill in magic: having cut off the head of one Mimer, who in his life-time was in great reputation for wiſdom, he cauſed it to be embalmed, and perſuaded the Scandinavians that he had reſtored it to the uſe of ſpeech; and he cauſed it to pronounce whatever oracles he wanted. The Icelandic chronicles repreſent Odin as the moſt eloquent and perſuaſive of men: they aſcribe to him the introduction of the art of poetry among the Scandinavians, and likewiſe the invention of the Runic characters. He had alſo the addreſs to perſuade his followers, that he could run over the world in the twinkling of an eye; that he had the direction of the air and tempeſts; that he could transform himſelf into all ſorts of ſhapes, could raiſe the dead, could foretell things to come, deprive his enemies, by enchantment, of health and vigour, and diſcover all the treaſures concealed in the earth. They add, that by his tender and melodious airs, he could make the plains and mountains open and expand with delight; and that the ghoſts, thus attracted, would leave their infernal caverns, and ſtand motionleſs about him. Nor was he leſs dreadful and furious in battle; changing himſelf into the ſhape of a bear, a wild bull, or a lion, and amidſt ranks of enemies committing the moſt horrible devaſtation, without receiving any wound himſelf. The era of Odin has never been ſatisfactorily aſcertained: nor is it eaſy to decide which is the moſt probable of the three ſuppoſitions reſpecting it that are extant. Gräter, with ingenious raſhneſs, ſuppoſes the iſland Sams mentioned in the Edda to be the Samos of the Archipelago; and, from ſome faint reſemblance between the Gothic coſmogony and that of a Samian philoſopher, he infers Odin to have been a pupil of Meliſſus; and thus he throws back his antiquity to a period, which would make it probable that the Scythian kings of Herodotus are the heroes deified in Gothic ſong. Mallet defends the wilder becauſe wholly baſeleſs conjecture, that the arms of Pompey occaſioned Odin to migrate from the Euxine to the Baltic. In this caſe, Pliny and Tacitus would have met with traces of his progreſs among the nations whom they deſcribe. Extenſive recent conqueſts, terminating in the impoſition of a new religion, could not but live in the memory even of barbarians. It is therefore moſt probable that Odin is poſterior to theſe writers, and that the Anglo-Saxon hiſtorians are correct, who deſcribe Hengiſt as fifth in deſcent from Odin, and who have preſerved the intervening pedigree. As in paſtoral nations marriages take place early, it is unlikely that any progenitor of Hengiſt ſhould have paſſed in celibacy his twenty-fifth year. An interval of 125 years is enough to allow between Odin himſelf and his grandſon Vecta's great-grandſon, Hengiſt. This would place Odin in the year of Chriſt 325, about 70 years before Alaric, and would plauſibly account for the momentous impulſe which, about that time, propelled the Gothic multitudes againſt all the provinces of the Roman empire.

Odin is called, in the Edda, and by Snorro, *Runhofdi* and *Runomfauthr*, father of letters, king of ſpells, as the poets phraſe it; which favours the opinion that he introduced the art of writing among the Goths. Now Tacitus expreſsly pronounces the alphabet to have been unknown to the Germans; *literarum ſecreta viri pariter ac fœminæ ignorant:* Odin, then, muſt have lived ſubſequently to this period. The oldeſt Runic inſcriptions on ſtone commemorate the fortunes of ſoldiers who had ſerved at Conſtantinople in the corps of Varangi; and the art of ſtone-cutting in the North is therefore poſterior to the transfer of the ſeat of empire from Rome to Conſtantinople. Now Odin, according to Snorro, firſt introduced the practice of uſing grave-ſtones: in his time, no doubt, they were ſimply inſcribed, not engraved: but theſe cannot long have preceded the more permanent memorials. This circumſtance, again, tends to corroborate a chronology which places Odin at the beginning of the fourth century.

There exiſts a Ruſſian map of the year 949, (the fac ſimile may be found in Schlötzer's Northern Hiſtory, p. 490.) in which the coaſt of Eſthonia is called Oſtrogard, or the *Eaſt garden*. If the oppoſite coaſt of Courland was called Aſgard, or the *Weſt garden*, the river Duna which ſeparates them may well have borne the name Mitgard. In Samo-getia, various etymological notices unite to indicate the original dwelling-place of Odin: it was natural, after his ſettlement in Upland, to ſing the "glad home" which he had forſaken; to promiſe a return thither to the ſpirits of ſuch as fell in battle; and to indicate the rainbow, which is uſually ſeen in the eaſt, as the

bridge which was to direct their path. Monthly Review, vol. xxvii. p. 382. See EDDA, and Mallet's North. Antiq. vol. i. ch. iv. and v.

ODINGTON, WALTER, in *Biography*, a monk of Eveſham, in Worceſterſhire, of whoſe writing a treatiſe is preſerved in the library of Bene't college, Cambridge, that is ſo copious and complete, with reſpect to every part of muſic when it was written; that if all other muſical tracts, from the time of Boethius to Franco and John Cotton, were loſt, our knowledge would not be much diminiſhed, if this MS. was acceſſible.

The ingenious author of this work was eminent in the early part of the thirteenth century, during the reign of Henry III. not only for his profound knowledge in muſic, but aſtronomy, and mathematics in general. The tranſlator and continuator of Dugdale's Monaſticon, ſpeaks of him among learned Engliſhmen of the order of St. Benedict in the following manner:

"Walter, monk of Eveſham, a man of a facetious wit, who applying himſelf to literature, leſt he ſhould ſink under the labour of the day, the watching at night, and continual obſervance of regular diſcipline, uſed at ſpare hours to divert himſelf with the decent and commendable diverſion of muſic, to render himſelf the more chearful for other duties." This apology, however, for the time he beſtowed on muſic, was needleſs; for it was, and is ſtill, ſo much the buſineſs of a Romiſh prieſt, that to be ignorant of it diſqualifies him for his profeſſion. And at all times, where an eccleſiaſtic thought it neceſſary to trace the whole circle of the ſciences, muſic having the ſecond or third rank, could not be neglected. But what this author adds farther concerning Odington is ſtill leſs defenſible: "Whether," ſays he, "this application to muſic drew him off from other ſtudies I know not, but there appears no other work of his than a piece entitled "Of the Speculation of Muſick." Yet we are told by Pits, Bale, Tanner, Moreri, and all his biographers, that he wrote "De Motibus Planetarum, et de Mutatione Aëris," as well as on other learned ſubjects. As Walter of Eveſham lived at a period which furniſhes but few records concerning the ſtate of muſic in England; and as we are acquainted with no other copy of his MS. than that which is preſerved at Cambridge, we ſhall be ſomewhat the more minute in deſcribing its contents, and pointing out its peculiarities.

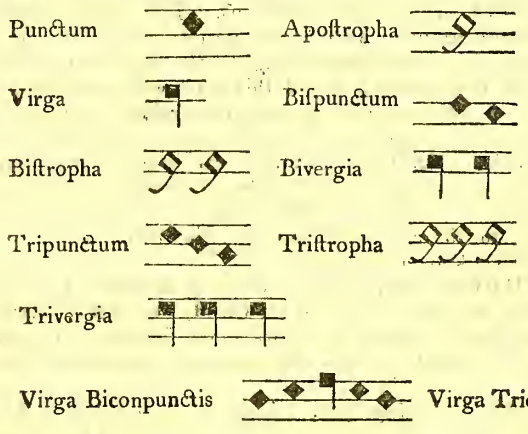
The firſt page, only, has been injured by time, and ſome vacuities have been left by the ſcribe, which ſeem intended to have been filled up with red ink. The work is divided into ſix parts, or books.

The firſt, "De Inequalitate Numerorum et eorum habitudine," contains ten chapters, on the diviſion of the ſcale, and harmonical proportions.

The ſecond part conſiſts of eighteen chapters. In the introduction to this part he calls the concords *ſymphonies*, which is frequently the language of Hubald, Odo, and Guido. The firſt chapter is an "Eulogium upon Muſic," in which he enumerates the nine Muſes and their attributes; ſpeaks of David's power over the evil ſpirit of Saul, by means of his harp; quotes Clemens Alexandrinus, but not in Greek; and after giving the invention of inſtruments to Tubal, relates the manner in which Pythagoras diſcovered harmonical proportions by the weights of a blackſmith's hammers. Speaks of major and minor ſemitones, and of the comma. He has a long chapter on the proportions of the major and minor thirds: here he takes occaſion to deſcribe the different kinds of human voices, from the ſhrill cries of the infant to the deep and dying groans of an old man; but mentions not thoſe of the *evirati*. Accounts for the thirds having been regarded as diſcords by the ancients who adhered to the proportions of Pythagoras; and ſays, that to pleaſe in harmony they muſt neceſſarily be altered, or, as it was afterwards called, *tempered*. In his ſeventeenth chapter he gives a liſt of concordant diſcords, *concordes diſcordiæ*, or the leſs perfect double ſounds; and theſe he ſays are ſix: the minor and major third; the *diapente cum tono*, or major ſixth; the two tenths, or octaves of the thirds; and the diapaſon and diateſſaron, or eleventh.

The third part is chiefly ſpeculative, and confined to harmonics: forming the ſcale, and dividing the monochord, by numbers, and giving rules for the proportions of organ pipes, and the caſting of bells. He ſpeaks of the three kinds of melody, "De tribus generibus Cantilenæ;" and after deſcribing the diatonic, chromatic, and enharmonic of the ancients, he ſupports his opinions by the authority of Nicomachus. Greek muſical authors, or at leaſt their doctrines and technical terms, ſeem familiar to Odington, who quoted the firſt book of Euclid at the beginning of his work, and in this third part he gives the characters and names of the notes in the Greek ſcale, and tranſlates them into the ſame language as Martianus Capella and Boethius. In his chapter "De Organis componendi," he gives a diagram of numbers and intervals, in naming which by the letters of the alphabet he begins with the Greek Γ, and goes on from A to S. At the ſide of the diagram he mentions the Greek names of the ſeveral tetrachords and conſonances; with the numbers, tones, and ſemitones. All this is manifeſtly for the proportions of pipes in the inſtrument called an *organ*, not the *organum*, or ſecond voice part in diſcant, of which he treats in his laſt book, as will appear farther on. This, and his chapter "De Cymbalis faciendis," or caſting of bells, are curious, and the firſt inſtructions of the kind that we have ever ſeen among the MSS of the middle ages.

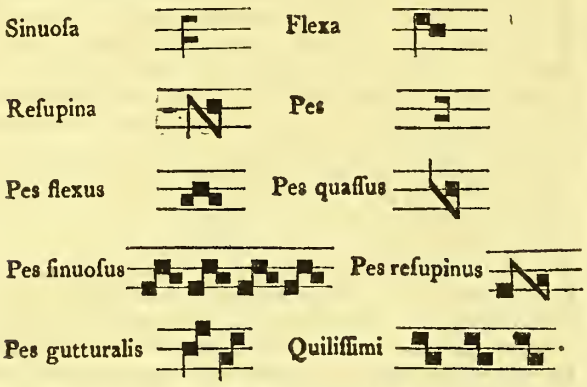
Names and figures occur in this work of ſuch notes as were in uſe in the Weſtern church before the invention of lines, many of which were not merely characters to expreſs the elevation and depreſſion of ſounds, but, according to Odington, theſe characters extended their import to the inflections of the voice in almoſt every ſpecies of interval, while groups of notes were expreſſed by a ſingle term of art; and as but few ſuch characters and technical terms occur in any other author, we ſhall inſert, for the ſatisfaction of curious readers, the following ſpecimens:




punctis—condiateſſaries, condiapentis, &c. &c. He gives examples of all theſe in ſimilar characters; that is, in breves with a long, as far as ſix notes, or a hexachord aſcending and deſcending, but without calling them by thoſe names.

The

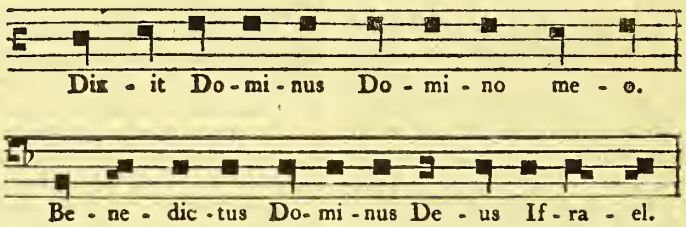
The following are characters to expreſs wider intervals, and ſhort paſſages:




He has many more, which ſeem never to have been adopted by ſucceeding writers.

After explaining theſe characters, he ſpeaks of the modern expedient of naming the ſounds from the ſyllables of the hymn "Ut queant laxis," &c. but without mentioning Guido. Then gives the great ſyſtem or ſcale in ſeptenaries, after Guido's manner, in capital, ſmall, and double letters. Here he ſpeaks of *voces mobiles* in the ancient manner, and of F quadrata, as uſed in *muſica falſa*, or tranſpoſitions, not, ſays he, "per diſſonem, ſed extranea et apud antiquos inuſitata." Then he has a chapter "De Mutationibus," in which he explains the change of names in ſolmiſation in the ſame manner as was done by ſucceeding writers long after his time.

The reſt of this book is employed in deſcribing different kinds of eccleſiaſtical chants, and in giving rules for compoſing them. Then dividing the modes into authentic and plagal, he gives examples of canto fermo, which ſeem more florid than appear in miſſals of the ſame period. The two following intonations, which he gives upon five lines, will ſerve as ſpecimens:







The *euouae*, initials, and finals of all the modes, are given in this kind of notation very amply, and always on five lines, and ſpaces. At the beginning of the laſt chapter of this book the words *Ananes*, *Neanes*, *Nana*, &c. uſed by Odo and the modern Greeks in their intonations, occur. This ſeems the moſt complete deſcription and notation of the eccleſiaſtical chant that we have found in any author of equal antiquity.

In the ſixth and laſt part, beſides the "Cantus Menſurabilis," he treats "De Generibus Cantuum Organorum, et de Compoſitione Cantuum Organorum," of organizing chants, or the compoſition of organic or ſecond parts to chants: and firſt, "De Organo Puro." Here we meet with all the technica of later times, as tenor, motetus, coloratus, cantilena, and rondellus. The muſical examples, however, as uſual in old manuſcripts, are incorrect, and frequently inexplicable, owing to the ignorance of muſic in the tranſcribers; but if this tract were corrected, and ſuch of the examples as are recoverable, regulated and reſtored, it would be the moſt ample, ſatisfactory, and valuable, which the middle ages can boaſt; as the curious enquirer into the ſtate of muſic at this early period may diſcover in it not only what progreſs our countrymen had made in the art themſelves, but the chief part of what was then known elſewhere.

**ODIO** & *Atia*, anciently called *breve de bono & malo*, in *Law*, is a writ directed to the ſheriff, to enquire whether a man, being committed to priſon on ſuſpicion of murder, be committed on juſt ſuſpicion, or only malice, and ill will.

**ODIR**, in *Geography*, a ſmall iſland in the Eaſt Indian ſea, near the W. coaſt of Aroo. S. lat. 5° 23′. E. long. 134° 58′.

**ODNESS**, a cape of Scotland, on the E. coaſt of the iſland of Stronſa. N. lat. 58° 59′. W. long. 2° 26′.

**ODO**, in *Biography*, a Romiſh ſaint and abbot of Clugny in the 10th century, was of noble deſcent, and born in the country of Maine, in the year 879. At the age of nineteen he was made canon of St. Martin's, at Tours, after which he went to Paris, and became a diſciple of St. Remi of Auxerre. Having reſolved to embrace the monaſtic life, he, in 912, took the habit in the monaſtery of Baume, in the dioceſe of Beſançon, where he was diſtinguiſhed by the practice of the moſt auſtere exerciſes of the cloiſter, and applied very earneſtly to the acquiſition of ſuch learning as the ignorance of the times permitted. He was appointed to preſide over the ſchool of the monaſtery, and in 926 he received prieſts' orders, and in the following year, upon the death of Berno, firſt abbot of Clugny, he was elected ſucceſſor in that dignity. At this period the Latin monks had loſt ſight of all ſubordination and diſcipline, and Odo ſet himſelf to correct abuſes. He not only obliged the monks to live in the regular obſervance of their rules, but alſo added to their diſcipline new rites and ceremonies, which were attended with an air of ſanctity, and which were ſevere and burthenſome. The fame of this new rule of diſcipline ſoon ſpread over Europe, and it was adopted in the greateſt part of the ancient monaſteries which had been founded in France, Germany, Italy, Britain, and Spain, as well as in the convents which had been newly eſtabliſhed. So high was Odo's reputation for wiſdom and ſanctity, that the popes, the biſhops, and the ſecular princes, paid the utmoſt deference to his counſels, and frequently conſtituted him arbiter of their diſputes. In 936 he took a journey, and was ſucceſsful in mediating a peace between Alberic, prince of Rome, and Hugh, king of Italy. Two years after this he went, a ſecond time, to Rome, and by his influence with Hugh, prevailed upon him to withdraw from the ſiege of the city. In 942 he made a third viſit to Rome, purely on religious motives, and while he was in that city he was attacked by a ſevere diſorder, which obliged him to haſten back to France. He died at Rheims, in the

ſixty-

ſixty-fourth year of his age. He was author of ſeveral works, which are collected in the 17th volume of the Bibl. Patrum. Moreri.

Mabillon (Acta Sanct. ord. 5. Bened. tom. vii. p. 126.) ranks Odo at the head of literature and the polite arts at the beginning of the tenth century. He ſtudied under St. Remi, at Paris, and, among other ſciences, applied himſelf ſo ſucceſsfully to muſic, that he was afterwards regarded as the moſt learned muſician of his time. He made three ſeveral voyages to Rome, in 936, 938, and 942, where, it is natural to ſuppoſe, he acquired a perfect knowledge of the Gregorian chant, and was initiated in all the refinements that were then practiſed in St. Peter's church and the pontifical chapel.

Some of his hymns, chants, and anthems, are ſtill preſerved in the Romiſh church; and there are two copies of a MS. tract upon muſic, of his writing, in the king of France's library at Paris. They are in ſeparate volumes, and both bound up with many other ancient muſical treatiſes. There is a tract of great antiquity in the library of Baliol college, Oxford, which, by the initial ſentence "Quid eſt muſica?" we once imagined to have been written by Odo; but are now convinced that it is the work of Guido himſelf: for, in carefully peruſing, and collating it with the extracts we had made from the Enchiridion of Odo, in the libraries of the late king of France, and elſewhere, as well as with the quotations from it in the Muſical Hiſtories of P. Martini, and the prince Abbot Gerbert, we find it to be totally a different work, agreeing in nothing but the initial queſtion. But the moſt beautiful and perfect copy which we have ſeen, and which perhaps can now be found of the ſcarce and curious tracts upon muſic, by the venerable monk Hubald, of St. Amand, and St. Odo, abbot of Cluny, ſubſiſt in the library of Bene't college, Cambridge.

We come now to the celebrated Enchiridion of Odo, which is written in dialogue, and mentioned with reſpect, even by Guido himſelf. "Incipit Scholium Enchiridij de Arte Muſica." The dialogue is between a maſter and his diſciple.

The diagrams and muſical examples are all given in the ſame characters as thoſe of Hubald. His doctrine of the tones, or eccleſiaſtical modes, is illuſtrated by innumerable ſpecimens in this kind of notation.

In this treatiſe, the barbarous and unmeaning words, in Gothic letters, occur, which the Greek church uſed during the ninth, tenth, and eleventh centuries, to characteriſe the modes or tones: *Nonanoeane*, *Noeane*, *Noioeane*, *Anoais*. The terms like theſe are ſtill retained by the modern Greeks in their eccleſiaſtical muſic, as we find by Leo Allatius, and by the Abate Martini's papers.

The entablature, or notation of Hubald and Odo, very much reſemble each other, as does their counterpoint; indeed theſe eccleſiaſtics were not only contemporaries and friends, but diſciples of Remi, monk of St. German d'Auxerre; and Odo, the youngeſt of the two, ſurvived Hubald but twelve years.

The firſt part of this tract ends thus: "Præterea et grata ſymphoniarum commixtio maximam ſuavitatem cantilenis adjicet."

And in the ſecond part he proceeds to the explanation of this extraordinary ſymphonic ſweetneſs; which, he tells his diſciple, conſiſts in the pleaſing mixture of certain ſounds, ſuch as the octave, 5th, 4th, &c.

Then follow examples of organizing in all his ſix concords, which are only thoſe of the ancients, 4th, 5th, 8th, 11th, 12th, and 15th; and in giving an example in four parts, where he doubles the organum and principal part to theſe words, *Nos qui vivimus*, they move conſtantly in theſe intervals, uniſon, 4th, 8th, and 11th.

The author next proceeds to give the ratio of ſounds, and to ſhew the alliance between muſic and mathematics, calling arithmetic the mother of muſical tones.

He afterwards treats of the proportions of flutes or muſical pipes, to which he applies his harmonics.

The laſt chapter is a ſummary of the tones or modes of canto fermo; and here, as elſewhere, his examples are always in the ſame hieroglyphic notation: NOſAſNOſſ EſAſſ NE—&c.

This laſt chapter is not quite perfect; the tranſcriber having omitted ſome of the muſical examples and diagrams. Only ſix of the eight modes are finiſhed. The ſeventh, however, is begun, and not more than one, or two pages at moſt, can be wanting to complete theſe two ſcarce and valuable relics of the firſt eſſays at modern harmony; which, however rude, uncouth, and barbarous, continued in the church, without offending Chriſtian ears, for more than three centuries: for the monk Engelbert, who, in the latter end of the thirteenth century, at the inſtigation of his friends, wrote a treatiſe on muſic, tells us, that all regular diſcant conſiſts of the union of 4ths, 5ths, and 8ths.

It has already been ſhewn that this kind of harmony, miſerable and nauſeous as it would be to our palates, did not offend Guido; on the contrary, he recommends the regular ſucceſſion of fourths above all other concords, to excite and expreſs pleaſure and jubilation. Nor do any advances or attempts at variety ſeem to have been made in counterpoint from the time of Hubald to that of Guido: a period of more than a hundred years.

Indeed it is hardly poſſible to examine the laſt ſpecimen of Hubald's counterpoint, without being aſtoniſhed that no advances had been made in the art for a whole century; for, with all its faults and crudities, it is at leaſt equal to the beſt combinations of Guido. But perhaps Hubald's inventions or improvements never eſcaped the confines of his convent, or at moſt, were only publiſhed in his own dioceſe; and, like the propoſals of other ingenious men, whoſe views are extenſive, and who anticipate future diſcoveries, they were not adopted or reduced to practice in his life-time. His idea that one voice might wander at pleaſure through the ſcale, while the other remains fixed, ſhews him to have been a man of genius and enlarged views, who diſregarding rules, could penetrate beyond the miſerable practice of his time into our *points d'orgue*, *pedale*, and multifarious harmony upon a holding note or ſingle baſe, and ſuggeſt the principle, at leaſt, of the boldeſt modern harmony. Odo is the only one of his contemporaries, or ſucceſſors, whoſe writings have come to our knowledge, that has imitated his notation.

ODOACER, firſt barbarian king of Italy, was the ſon of Edecon, a chieftain of the tribe of the Scyrri, who had been in the ſervice of Attila, king of the Huns. After the death of his father, and the diſperſion of his nation, Odoacer for ſome time led a wandering life among the barbarians of Noricum, with a mind and fortune ſuited to the moſt deſperate adventures; and when he had fixed his choice, he viſited the cell of Severinus, the popular ſaint of the country, to ſolicit his approbation and bleſſing. The lowneſs of the door would not admit the lofty ſtature of Odoacer: he was obliged to ſtoop, but in that attitude the ſaint could diſcern the ſymptoms of his future greatneſs, and addreſſing him in a prophetic tone, he ſaid, "Purſue your deſign; proceed to Italy; you will ſoon caſt away this coarſe garment of ſkins,

and your wealth will be adequate to the liberality of your mind." He accepted and ratified the prediction, was admitted into the ſervice of the weſtern empire, and ſoon obtained an honourable rank in the guards. In the year 476, the barbarian mercenaries in the Roman army demanded a third part of the lands of Italy as a reward for their ſervices, which the patrician Oreſtes refuſing to grant, they unanimouſly placed at their head Odoacer, and proclaimed him their king. He marched againſt Oreſtes, took him priſoner, and put him to death: he next depoſed Auguſtulus, the ſon of Oreſtes, who had been placed on the imperial throne of the weſt by his father, and who was the laſt that poſſeſſed that title. Odoacer ſpared him on account of his youth, but aſſumed the government of Italy with the title of king; he abſtained during his whole reign from the uſe of the purple and the diadem, leſt he ſhould give offence to thoſe princes, whoſe ſubjects, by their accidental mixture, had formed the victorious army, which time and policy might inſenſibly unite into a great nation. "Royalty," ſays the hiſtorian, "was familiar to the barbarians, and the ſubmiſſive people of Italy were prepared to obey, without a murmur, the authority which he ſhould condeſcend to exerciſe as vicegerent of the emperor of the weſt. But Odoacer had reſolved to aboliſh that uſeleſs and expenſive office, and ſuch is the weight of antique prejudice, that it required ſome boldneſs and penetration to diſcover the extreme facility of the enterprize. The unfortunate Auguſtulus was made the inſtrument of his own diſgrace; he ſignified his reſignation to the ſenate, and that aſſembly, in their laſt act of obedience to a Roman prince, ſtill affected the ſpirit of freedom, and the forms of the conſtitution." The preciſe year in which this event of the extinction of the weſtern empire took place is not aſcertained, but it was ſome time between the years 476 and 479. Odoacer appears to have conducted himſelf in the exerciſe of his authority with more juſtice and moderation, than might have been expected from one who roſe to power by ſuch means as he had adopted. He reſpected the ancient laws and inſtitutions of the country, and cauſed juſtice to be ſtrictly adminiſtered. After an interval of ſeven years he reſtored the conſulſhip of the weſt. He protected the confines of Italy by his arms, croſſed the Adriatic to take poſſeſſion of Dalmatia, and conquered the king of the Rugians in the province of Noricum. Notwithſtanding the prudence and ſucceſs of Odoacer, his kingdom exhibited the melancholy proſpect of miſery and deſolation. Since the age of Tiberius, the decay of agriculture had been felt in Italy, and it was a ſubject of juſt complaint, that the exiſtence of the Roman people depended on the accidents of the winds and waves. The number of the inhabitants continually diminiſhed with the means of ſubſiſtence, and the country was exhauſted by the irretrievable loſſes of war, famine, and peſtilence. In this ſtate of things, the famous Theodoric, king of the Oſtrogoths, was perſuaded, by the emperor Zeno, to turn his arms againſt the king of Italy: he ſucceeded in his attempt, and overcame him in three obſtinate engagements; and in the laſt he was obliged to make propoſals for accommodation, which were readily liſtened to. This was at Ravenna, the biſhop of which city negociated a peace between the two kings, and it was agreed, under the ſanction of an oath, that they ſhould rule with equal and undivided authority the provinces of Italy. After ſome days had been devoted to the ſemblance of joy and friendſhip, Odoacer, in the midſt of a ſolemn banquet, was ſtabbed by the hand, or at leaſt by the command, of his rival, and at the ſame time all his officers and mercenaries were maſſacred. This event happened in March 493. Univer. Hiſt. Gibbon.

ODOEV, in *Geography*, a town of Ruſſia, in the government of Tula, on the Upha; 52 miles W. of Tula. N. lat. 53° 50′. E. long. 36° 14′.

ODOLI-HOTUN, a town of Chineſe Tartary. N. lat. 43° 32′. E. long. 127° 38′.

ODONTAGNATHUS, in *Ichthyology*, a genus of fiſhes of the order Apodes. The generic character is as follows: mouth furniſhed with ſtrong, moveable laminæ, or proceſſes on each ſide the upper jaw; the gill-membrane is five-rayed. There is but a ſingle

Species.

ACULEATED. This derives its ſpecific name from the aculeated abdomen. The genus was inſtituted by La Cépéde, whoſe deſcription is as follows. The head, the body, and tail, are very compreſſed; the lower jaw is longer than the upper, and is much elevated towards the other when the mouth is cloſed, ſo as to appear almoſt vertical, and is lowered ſomewhat in the manner of a drawbridge, when the mouth is opened; it then appears like a ſmall ſcaly boat very tranſparent, furrowed beneath, and finely denticulated on the margins. This lower jaw, in the act of depreſſion, draws forwards two flat, irregular laminæ of a ſcaly ſubſtance, a little bent at their poſterior end, and larger at their origin than at the tips, denticulated on their anterior margin, and attached, one on one ſide, and the other on the oppoſite, to the moſt prominent part of the upper jaw; in the middle of the jaws is placed the tongue, which is pointed and free in its movements: the gill-covers, which are compoſed of ſeveral pieces, are very tranſparent at the hind part, but ſcaly, and of a bright ſilver-colour in front; the gill-membrane is alſo ſilvery, and has five rays; the breaſt is terminated below by a ſharp carina, furniſhed with twenty-eight ſpines, diſpoſed in two longitudinal ranges; the anal-fin is very long, and extends almoſt as far as the baſe of the tail-fin, which is of a forked ſhape; the dorſal-fin is placed on the tail, properly ſpeaking, at about three quarters of the whole length of the animal, but it is extremely ſmall. The colour is ſuppoſed to be of a bright ſilver, from the ſpecimens preſerved ſome time in ſpirits. It is a native of the American ſeas, and is common about the coaſts of Cayenne, where it is ranked as a ſpecies of food.

ODONTAGOGOS, from ὀδὰς, *a tooth*, and ἀγω, *to draw*, in *Surgery*, an inſtrument for drawing teeth.

ODONTAGRA, from ὀδὰς, *a tooth*, and ἀγρεύω, *to ſeize*, an inſtrument for drawing teeth. Alſo gouty pain in the teeth.

ODONTALGIA, from ὀδὰς, *a tooth*, and ἀλγος, *pain*, the tooth-ache. See TOOTH-ACHE.

ODONTIASIS, from ὀδοντιάω, *to cut the teeth*; dentition.

ODONTICA, from ὀδὰς, remedies for the tooth-ache.

ODONTIRRHŒA, from ὀδὰς and ῥέω, *to flow*, bleeding from the ſocket, after the extraction of a tooth.

ODONTISME, in the *Muſic of the Ancients*, made, according to Jul. Pollux, a part of the Iambic and a third part of the Pythian nome.

ODONTITES, in *Botany*, ſo called from ὀδὰς, ὀδοντος, *a tooth*, a plant mentioned by Pliny as "a ſort of hay, with ſmall denſe, or crowded, ſtems from the ſame root, which are jointed, triangular, and black. It has ſmall leaves at the joints, but longer than thoſe of *Polygonum*. Seeds axillary, reſembling barley. Flower purple, ſmall. It grows in meadows. A decoction of a handful of the ſtalks in wine of a rough flavour, held in the mouth, cures the tooth-ache." Botaniſts have preſumed the above deſcription to apply to the *Lychnis Flos Cuculi*, ſome latitude being allowed for what concerns the ſeeds. Linnæus has followed

Tabernæ-

Tabernæmontanus, in taking a ſpecies of *Euphraſia*, or *Bartſia* of *Fl. Brit.*, for the *Odontites*, and has retained this word as its ſpecific name. Pliny's deſcription, ſuch as it is, agrees beſt with the above *Lychnis*, whoſe very remarkably toothed petals, might almoſt induce a ſuppoſition that the ancients were led in this inſtance, as in ſome others, to judge of the virtues of plants by their ſhape or ſtructure. On this ground the Orchis roots have been thought aphrodiſiac, and plants with oblong tuberous roots, good for the piles! We know not that any particle of truth has been ſtumbled upon by this ſagacious mode of inveſtigation; for where there may happen to be any ſuch coincidence, the qualities of the plants were all, if we miſtake not, previouſly known. The only famous writer on this ſubject, and one is ſurely enough, is Giovanni Baptiſta Porta, a Neapolitan, who in the latter part of the ſixteenth century collected all that can be ſaid about it, and certainly much more than is worth reading.

ODONTOGLYPHON, from οδους, and γλυφω, *to ſcrape*, in *Surgery*, an inſtrument for ſcraping the tartar off the teeth.

ODONTOIDES, in *Anatomy*, from οδους, οδοντος, *a tooth*, and ειδος, *form*, a name given to a proceſs of the ſecond vertebra of the neck. See SPINE.

ODONTOPHYIA, from οδους and φυω, *to grow*, in *Surgery*, the proceſs by which the teeth are firſt formed: dentition.

ODONTOTRIMMA, from οδους, and τριβω, *to wear away*, a dentrifice, or application for cleaning the teeth.

ODOR, or ODOUR. See SMELL, and NOSE.

ODORAMENTUM, in *Pharmacy*, a medicine applied for the benefit of its ſmell, whether it be fetid, or agreeable.

Such are frequently uſed in hyſteric and hypochondriac diſorders; *e. gr.* aſſafœtida, camphor, &c.

ODORIFERÆ, in *Anatomy*, certain glands belonging to the male organs of generation. See GENERATION.

ODOROUS, or ODORIFEROUS *Things*, are ſuch as exhale a briſk, agreeable ſmell, ſenſible at a diſtance.

Such are the jeſſamin, roſe, tuberoſe, &c.

ODOVARA, in *Geography*, a ſea-port town of Japan, in the iſland of Niphon; 120 miles E.N.E. of Meaco.

ODRAU, a town of Sileſia, in the principality of Oppau, near the Oder; 32 miles W.S.W. of Teſchen.

ODYSSEY, ODYSSEA, formed from Οδυσσεια, which ſignifies the ſame with Οδυσσευς, *Ulyſſes*, an *epic* poem of Homer, wherein he relates the adventures that befel Ulyſſes in his return to Ithaca from the ſiege of Troy.

The deſign of the Iliad, F. Boſſu obſerves, is to inſtruct the ſtates of Greece, conſidered as united in one body, or as parts of the whole; and that of the Odyſſey, to inſtruct thoſe ſame ſtates, conſidered in their private capacities.

A ſtate conſiſts of two parts: the head, which commands, is the firſt; and the members, that obey, the ſecond. Now, inſtructions are required both for the one and the other; but it is poſſible to have them both conveyed under the ſame perſon.

The fable, then, of the Odyſſey is as follows. A prince had been obliged to quit his country, and lead an army of his ſubjects upon a foreign expedition. After having glorioufly executed this, he was upon his return home; but in ſpite of all his endeavours, was detained for ſeveral years by tempeſts, which threw him on ſeveral countries very different from one another as to manners, cuſtoms, polity, &c.

In the dangers he had to ſtruggle with, his companions, neglecting his advice, all periſhed through their own default. In the mean time, the great men of his country, abuſing his abſence, commit ſtrange diſorders in his palace, ſquander his treaſure, lay ſnares for his ſon, and would force his wife to chooſe a huſband among them; all this from an opinion, that he was entirely loſt. But at length he returns; and having diſcovered himſelf to his ſon, and ſome others of his friends who had perſiſted in their allegiance, he becomes an eye-witneſs of the inſolence of his courtiers; puniſhes them as they deſerved; and reſtores that peace and tranquillity to his iſland, which had been baniſhed during his abſence.

The truth or model on which this fable is founded is, that a perſon's abſence from home, ſo that he cannot have an eye to his affairs, occaſions great diſorders. Accordingly, the hero's abſence is the principal and moſt eſſential part of the action, and takes up the greateſt part of the poem.

This poem, Boſſu adds, is more calculated for the people than the Iliad is, where the ſubjects ſuffer rather from the ill conduct of their princes than by their own faults. The great names of heroes, Ulyſſes, &c. do not here repreſent the pooreſt peaſants leſs than princes, Cæſars, Alexanders, &c. The meaneſt people are as liable to ruin their eſtates and families by negligence, &c. as the greateſt; and accordingly have as much need of Homer's lectures, and are as capable of profiting by them, as kings themſelves.

Dr. Blair obſerves, that Longinus's criticiſm on the Odyſſey is not unfounded; *viz.* that Homer may in this poem be compared to the ſetting ſun, whoſe grandeur ſtill remains, without the heat of his meridian beams. It wants the vigour and ſublimity of the Iliad; and yet poſſeſſes ſo many beauties as juſtly to entitle it to high praiſe. It is a very amuſing poem, and has much greater variety than the Iliad: its numerous ſtories are intereſting, and its deſcriptions are beautiful. The ſame deſcriptive and dramatic genius, and the ſame facility of invention that appear in the Iliad, are manifeſt in the Odyſſey. Although it deſcends from the dignity of gods and heroes, and warlike achievements, it nevertheleſs affords more pleaſing pictures of ancient manners. Inſtead of the ferocity that reigns in the Iliad, the Odyſſey preſents us with the moſt amiable images of hoſpitality and humanity, entertains us with many wonderful adventures, and inſtructs us by a conſtant vein of morality and virtue, which runs through the poem. The Odyſſey, however, has acknowledged defects. Many of its ſcenes fall below the majeſty expected in an epic poem. The laſt 12 books, after Ulyſſes is landed in Ithaca, are, in ſeveral parts, tedious and languid; and though the diſcovery which Ulyſſes makes of himſelf to his nurſe Euryclea, and his interview with Penelope before ſhe knew him, in the 29th book, are tender and affecting, yet the poet does not ſeem happy in the anagniſis or the diſcovery of Ulyſſes to Penelope; ſhe is too cautious and diſtruſtful, and we are diſappointed of the ſurpriſe of joy, which we expected on that high occaſion. Blair's Lect. vol. iii.

Gerard Croes, a Dutchman, in a book entititled Ομηρος Εβραιος, printed at Dort, in 1704, endeavours to prove, that the ſubject of Homer's two poems are taken from the Scriptures; that the action of the Odyſſey, in particular, is nothing elſe but the adventures of the Iſraelites till the death of Moſes; and that the Odyſſey was compoſed before the Iliad, the ſubject whereof is the taking of Jericho. What fancies!

OE, in *Geography*, a ſmall iſland of Denmark, N. of Laland. N. lat. 54° 58′. E. long. 11° 31′.

OEBSFELD, a town of Weſtphalia, in the duchy of Magdeburg, on the Aller; 30 miles N.W. of Magdeburg.

ŒCOLAMPADIUS, called in his own country HAUKSCHEIN, JOHN, in *Biography*, one of the moſt learned German reformers in the 16th century, was born at Winſperg, a village in Franconia, in the year 1482. He was educated with a view to ſome learned profeſſion, and was, when he had made conſiderable progreſs in grammar-learning, ſent to the univerſity of Heidelberg, where he was admitted to the degree of bachelor of philoſophy when only fourteen years of age. As ſoon as he had taken the degree of M. A. his parents ſent him to Bologna in Italy, with a view to his ſtudying the law under the celebrated profeſſors of juriſprudence, for whom that univerſity was in high repute. After the end of ſix months he returned to Heidelberg, where he gave up all thoughts of ſtudying the law as a profeſſion, and applied himſelf to theology. His object was very different from the uſual courſe purſued at that period; inſtead of aiming at the glory of excelling as a diſputant in the public exerciſes of the univerſity, his chief ambition was to ſtore his mind with valuable and uſeful knowledge. One of his earlieſt ſteps in life was that of becoming tutor to the children of Philip, elector palatine, but Œcolampadius ſoon became diſguſted with the manners of the court, relinquiſhed his charge, and reſumed with freſh ardour his theological ſtudies. Having finiſhed the uſual academical ſtudies, he quitted the univerſity, and having received prieſt's orders, he entered upon a living at Winſperg, his native place, which had been endowed by his father. He had not officiated many weeks, when a diffidence in his own talents and qualifications led him to obtain leave to go to Stutgard for further improvement, where he attended the lectures of the learned Reuchlin, and perfected himſelf in the Greek and Hebrew languages. After this he returned to his benefice, and was diſtinguiſhed by the great zeal and diligence with which he performed the ſeveral duties attached to the paſtoral offices. During the reſidence of Œcolampadius at the univerſity of Heidelberg, he had contracted an intimacy with Wolfgang Capito, who was now ſettled at Baſil, and who obtained for his friend an invitation from the biſhop of Baſil to become a preacher in that city, and upon his arrival the prelate appointed him to the duties of the principal church. This was in the year 1515, and in the following year, when Œcolampadius was about thirty-four years of age, he took his degree of D. D. At this period Eraſmus came to Baſil to print his "Annotations on the New Teſtament," in which work he was aſſiſted by Œcolampadius, who, in a ſhort time, was invited to ſettle at Augſburg, where he preached in the great church, but finding a ſtrong leaning towards the principles of the reformation, and not having courage to riſk the conſequences of ſuch a change in his opinions, he entered the monaſtery of Alton, in the neighbourhood of Augſburg, to avoid being queſtioned on the ſubject. His friends greatly diſapproved of this ſtep, urged him to quit the monaſtery, and a regard to his private ſafety led him, at length, to comply with their ſolicitations. He had already given his private opinion in favour of the reformers, and had by his publications, particularly one on "Confeſſion," given a ſtrong handle to his enemies, of whom John Glaſſio, a Franciſcan, and chaplain to Charles V., projected the deſign of taking him into cuſtody, and holding him up as an example of ſignal puniſhment; he had, however, information of their deſign three days before it was to be put into execution, and by this he was enabled to retire out of the reach of his enemies. Having arrived in ſafety at Baſil in 1522, he applied himſelf to the tranſlation into Latin of St. Chryſoſtom's "Commentary upon the Book of Geneſis." He was almoſt immediately appointed profeſſor of divinity by the ſenate, and in the following year was nominated miniſter of St. Martin's pariſh. Theſe inſtances of preferment he refuſed to accept, but upon the expreſs conditions that he ſhould be at perfect liberty to teach whatever was clearly warranted, according to his own opinions, by the ſacred Scriptures, and that he ſhould not be obliged to retain ſuch popiſh ceremonies as he conſidered to be uſeleſs. He now felt his mind at liberty, and openly preached againſt the leading tenets of the church of Rome, and was attended by very crowded auditories, who readily embraced the ſentiments of the reformers. One of the firſt alterations which he introduced, under the ſanction of public authority, was that of adopting the vulgar tongue at the baptiſm of infants. Afterwards the ſacrifice of the maſs was aboliſhed, and the ſacrament of the Lord's Supper was ordered to be adminiſtered in both kinds. Our reformer went ſtill further, and held up to contempt, as ſuperſtitious ceremonies, the uſe of holy water, conſecrated palms, tapers, &c. While the reformation was taking deep root at Baſil, the diſpute took place between Luther and Zuingle concerning the manner of Chriſt's preſence in the Euchariſt: in this controverſy Œcolampadius embarked on the ſide of Zuingle, and in 1525 publiſhed a Latin treatiſe in defence of his opinion, entitled "De vero intellectu verborum Domini, *hoc eſt corpus meum*," which was pronounced by the learned Eraſmus to be drawn up with ſo much ſkill and ingenuity, that even the elect were in danger of being ſeduced by it. In the year 1527, the reformers having been challenged by the Catholics to a public diſpute at Baden, Œcolampadius entered the liſts againſt Eckius, on the ſubjects of tranſubſtantiation, &c. the reformer declaring that he would not ſubmit to have the points at iſſue determined by any other rule of judgment than the word of God, and that none ſhould be acknowledged as judges who would not decide according to the canon of Scripture. After the diſcuſſions were ended, the Swiſs who were preſent formed themſelves into two parties, of which one awarded the victory to Eckius, and the other to Œcolampadius; and even the deputies from Baſil, where Œcolampadius was held in the higheſt eſtimation, were divided upon the ſubject. That the peace of the republic might not be diſturbed by the conteſts of their reſpective partizans for ſuperiority, the ſenate very judiciouſly and wiſely paſſed a law, confirming both to the Catholics and the reformed the equal enjoyment of religious liberty. In 1528 our reformer married, and having completed the reformation of the church at Baſil, he was called to Ulm, where, in conjunction with Martin Bucer, and others, he eſtabliſhed the church of that city upon the ſame plan of doctrine and diſcipline which had been adopted by the reformed Swiſs churches. In 1531, while he was diligently employed in the diſcharge of his office as miniſter of the church of Baſil, and zealouſly ſerving the intereſts of the reformed religion by his advice and writings, he was attacked by the plague, to which he fell a ſacrifice in the forty-ninth year of his age. To the excellence of his character, both Catholics and Proteſtants have borne ample teſtimony, and of his talents and learning his works afford ſufficient evidence; theſe, which are numerous, conſiſt of Annotations and Commentaries on the books of Geneſis, Job, and the Pſalms, and upon the prophecies, alſo on ſeveral books of the New Teſtament. He tranſlated into Latin various pieces of the fathers; wrote numerous controverſial treatiſes; and after his death an intereſting volume of "Letters" between him and Zuingle was publiſhed at Baſil in 1536. Moreri. Bayle. MS. Life of Luther.

ŒCONOMICS, ŒCONOMICA, that part of moral philoſophy

loſophy which teaches how to manage the affairs of a family, or houſhold.

ŒCONOMUS, οἰκονομος, a perſon appointed to direct and manage a vacant church revenue, or that of a hoſpital, or other community.

ŒCONOMUS was alſo anciently uſed for a protector, or advocate, who defended the rights and effects of churches, monaſteries, &c.

ŒCONOMUS was alſo an appellation given to a church-office, who took care of the buildings and repairs of the church, and received and diſtributed alms according to the directions of the biſhop.

In this ſenſe it is that the ſixth council appoints, that every church have its œconomus.

ŒCONOMY, οἰκονομια, the prudent conduct, or diſcrete and frugal management of a man's eſtate, or that of another.

ŒCONOMY, *Political*. See POLITICAL *Economy*.

ŒCONOMY, *Public*. See *Public* POLICE.

ŒCONOMY, *Animal*, the firſt branch of the theory of medicine; or that which explains the parts of the human body; their ſtructure and uſe; the nature and cauſes of life and health, and the effects or phenomena ariſing from them.

This is otherwiſe called *phyſiology*; and its objects juſt enumerated are called the *naturals*, or *res ſecundum naturam*.

ŒCONOMY, *Legal*, or *Jewiſh*, or *Diſpenſation*, is the manner wherein God thought good to guide and govern his people under the miniſtry of Moſes. See JUDAISM.

This included not only the political and ceremonial laws, but alſo the moral law, inaſmuch as it pronounced a curſe on all thoſe who did not fulfil it perfectly.

ŒCONOMY, *Evangelical*, or *Chriſtian*, or *Diſpenſation*, is uſed in oppoſition to the *legal*; and comprehends all that relates to the covenant of grace, which God has made with men by Jeſus Chriſt.

ŒCONOMY *of the Parts of Plants*. See PLANT.

ŒCUMENICAL, formed of the Greek οἰκουμενικος, of οἰκουμενη, the *habitable earth*, or the *whole earth*, ſignifies as much as *general* or *univerſal*.

In this ſenſe we ſay an œcumenical council or ſynod; meaning one at which the whole Chriſtian church aſſiſted, or to which they were invited.

Du-Cange obſerves, that many of the patriarchs of Conſtantinople aſſumed to themſelves the quality and denomination of œcumenical patriarchs; particularly John the Faſter in 590, and Cyril, his ſucceſſor. Gregory the Great of Rome was exceedingly enraged at it; pretending it was a title of pride, and the character of antichriſt; as ſuppoſing the title of œcumenical to imply univerſal biſhop, or biſhop of all the world: whereas, in effect, it implied no more than the quality of chief of the Eaſtern church; in like manner as the firſt doctor of the church of Conſtantinople was called *doctor œcumenicus*.

The title œcumenical biſhop was firſt offered to Leo I., but he refuſed it: nor did his ſucceſſors accept of it for a long time. The fifth council of Conſtantinople gave it to John, patriarch of that city; though ſome of the Romaniſts pretend, that the emperor Phocas gave it, by way of preference, to the biſhop of Rome. (See POPE.) But thoſe of Conſtantinople have preſerved it; and ſo late as the council of Baſil, that patriarch uſed the title. But œcumenical here is only to be underſtood as of the extent of each patriarchate.

ŒCUMENIUS, in *Biography*, an ancient Greek commentator upon the Scriptures, who is ſuppoſed to have flouriſhed in the 10th century, was biſhop of Trica in Theſſaly. He was author of Commentaries upon the Acts of the Apoſtles, and the fourteen epiſtles of St. Paul, and the ſeven Catholic epiſtles, which contain a conciſe and perſpicuous illuſtration of thoſe parts of the New Teſtament. Beſides his own remarks and notes, they conſiſt of a compilation of the notes and obſervations of Chryſoſtom, Cyril of Alexandria, Gregory Nazianzen, Theodoret, and others. He is thought alſo to have written a commentary upon the four goſpels, compiled from the writings of the ancient Greek fathers, which is not now extant. The works of Œcumenius were firſt publiſhed in Greek at Verona in 1532, and in Greek and Latin at Paris in 1631, in two volumes folio. To the ſecond volume of the Paris edition is added the "Commentary" of Arethas upon the book of Revelation. Moreri. Lardner.

OEDA, in *Geography*, a town of Perſia, in Farſiſtan; 50 miles W. of Yezd. N. lat. 52° 25'. E. long. 11° 10'.

ŒDEMA, from οἰδεω, *to ſwell*. The term œdema, as a modern ſurgical writer has obſerved, was employed by ſome of the ancient authors in a ſenſe ſynonimous with eminence, extuberance, or tumour; but, ſince the time of Galen, it has been more ſtrictly confined to thoſe tumefactions, which are derived from the effuſion of a fluid into the cells of the reticular membrane of a particular part. The fluid is of the watery or ſerous kind. When the cellular membrane is extenſively filled in this manner, the diſeaſe is not uſually called *œdema*, but *anaſarca*.

Mr. Pearſon has diſtinguiſhed ſix ſpecies of œdema; *viz.*

1. } Œdema { flaccidum.
2. } { durius.
3. Œdema ſymptomaticum, vel tumor œdematoſus.
4. Œdema deuteropathicum.
5. Œdema cum erythemate.
6. Œdema purulentum.

*Of the Œdema Simplex Flaccidum*.—This form of the œdema, ſays Mr. Pearſon, is characteriſed by a tumefaction of the integuments, commonly about the feet, ankles, and anterior ſurface of the tibia. There is no particular diſcolouration of the parts. It is unattended with pain; but there is uſually a ſenſe of weight and tightneſs, and the freedom of motion is more or leſs impaired. Firm preſſure upon the tumefied part produces a little cavity, which is not very quickly effaced, and the feet are generally ſomewhat colder than natural. The œdema uſually increaſes towards the evening, but, in conſequence of reſt and a horizontal poſition, it generally ſubſides during the night.

According to Mr. Pearſon, the remote cauſes are of the following deſcriptions.

1. Compreſſion of the larger veins, or of the trunks of the abſorbent veſſels.

Obeſity. Gravid uterus. Tumours within the abdomen. Sitting long on a hard ſeat. Riding long in a carriage, or on horſeback. Tight bandages. Unequal preſſure from ſplints, &c.

2. Whatever diminiſhes the powers which propel the returning blood.

A ſedentary life. Long expoſure to cold, without exerciſe, and in perſons of advanced age. Expoſure to cold and damp. Old age in ſubjects who have led inactive lives.

3. Injurious effects produced on the ſtomach.

Drinking exceſſively of diluting liquids, ſpirits, or fermented beverages. Intemperance in eating.

4. Profuſe hemorrhages. Hypercatharſis.

5. Thoſe diſeaſes of the heart and lungs, which obſtruct the due tranſmiſſion of the blood through the pulmonary veſſels.

6. Local

6. Local injuries, as blows, ſprains; alſo inflammation, or eryſipelas of the lower extremities.

With regard to the prognoſis, the danger, or unimportance of this ſpecies of œdema, muſt principally depend upon the difficulty, or eaſe, with which the remote cauſe may be obviated.

In the treatment of the œdema ſimplex flaccidum, the indications are, to remove, if poſſible, the remote cauſe; to alter that ſtate of the ſyſtem, by which the diſeaſe is ſupported; and to promote the abſorption of the fluid diſtending the cellular membrane by means of purgatives and diuretic medicines. In the local treatment, the main objects are to facilitate the return of the blood by a horizontal poſture; to ſupport the parts, and promote abſorption, by the application of a flannel bandage; and to ſtrengthen the parts by friction, and the uſe of liniments. Bathing the parts in hot ſalt brine, or ſea-water, and the uſe of a laced ſtocking, will ſometimes both aſſiſt the cure, and prevent a relapſe.

*Œdema Simplex Durius.*—Mr. Pearſon obſerves, that this form of the diſeaſe appears in one, or both of the lower extremities; it is accompanied with pain, and ſome degree of lameneſs; but there is no diſcolouration of the ſkin, nor preternatural increaſe of temperature. The ſwelling is nearly uniform, and extends from a little below the knee to the ankle, ſeldom affecting the foot. The diſeaſed part is firmer than in the œdema ſimplex flaccidum, and yields very little to preſſure.

Mr. Pearſon conceives, that this diſeaſe is connected with a morbid ſtate of the deeply-ſeated abſorbents of the leg. It is ſaid to occur more frequently in women than men, and as often in young adults as in older perſons.

The remote cauſes are not always manifeſt. Amenorrhœa in plethoric habits; inactivity in corpulent perſons; and ſtanding a long while every day; are mentioned as circumſtances by which this ſpecies of œdema has been induced.

The treatment adviſed by the preceding gentleman, conſiſts in purging the patient every four or five days; giving ſmall doſes of calomel, with alkaline ſalt, on the intermediate days, enjoining reſt and a recumbent poſture, until the pain abates; and applying the vapour of ſpirit of wine and volatile alkali. When the hardneſs and extraordinary tenderneſs of the abſorbent veſſels are diminiſhed, he recommends the uſe of the linimentum ammoniæ, and the employment of a flannel bandage for a few weeks after the cure.

*Œdema Symptomaticum.*—This is ſtated to be not different from the œdema ſimplex flaccidum, and it is arranged under a ſeparate head, becauſe it occurs as a ſign of ſome other diſeaſe, without abſolutely conſtituting a part of it. Amongſt other caſes, the following are ſome, which this kind of œdema indicates the exiſtence of; ſimple fracture; fracture of the cranium; empyema; blood effuſed in natural cavities; deeply-ſeated abſceſſes; gangrene; diſeaſes of the perioſteum and bone; general debility, &c.

The cure of this complaint evidently depends upon the removal of the cauſe.

*Œdema Deuteropathicum ſeu Puerperarum.*—This form of œdema moſtly occurs about twelve or fifteen days after parturition; but it has ſometimes come on as early as the following day. In other inſtances, however, three or four weeks have elapſed before the attack. It uſually commences (ſays Mr. Pearſon) with pain about the calf of the leg, ſucceeded by tumefaction in the labium pudendi and groin, which gradually deſcends down the thigh, leg, and foot, ſo that, in the courſe of two or three days, the whole of the lower extremity acquires a very conſiderable increaſe of bulk. The limb is painful, preternaturally warm, and admits of no motion without great uneaſineſs being excited; but the colour of the ſkin is either unaltered, or whiter than natural. The integuments are firm, elaſtic, and do not yield to preſſure, as in the œdema ſimplex flaccidum. No water is uſually diſcharged on ſcarifying the part, nor is the ſwelling at all reduced by a horizontal poſition.

The diſeaſe never ſuppurates, nor does it leave any permanent induration, or lameneſs, although, in ſome caſes, ſeveral weeks elapſe before the patient recovers entirely the uſe of the limb.

The remote cauſes of this ſpecies of œdema do not appear to be underſtood with any degree of certainty.

The ſymptomatic inflammation may be relieved by ſuch medicines as promote a diaphoreſis; James's powder; ſaline draught with volatile alkali; liquor ammoniæ acetatis; ſmall doſes of the pulvis ipecacuanhæ compoſitus; camphor with opium, &c.

When the violence of the firſt ſymptoms has ſubſided, Mr. Pearſon adviſes the free exhibition of purgatives, eſpecially ſuch as are combined with calomel and alkaline ſalt, and they ſhould be repeated as frequently as the ſtrength of the ſyſtem will permit.

On the intermediate days, when the purgatives are not exhibited, Mr. Pearſon recommends bark, caſcarilla, myrrh, ſulphuric acid, and ſimilar tonics.

With reſpect to the local treatment, when the pain is very ſevere, the ſame gentleman thinks the application of leeches to the upper part of the thigh beneficial.

Anodyne fomentations; camphorated oil, with tincture of opium; and other liniments, are mentioned as uſeful; and a flannel bandage is to be applied as ſoon as the limb will bear it.

Other ſerviceable means are ſmall bliſtering plaſters; moderate exerciſe; and friction.

*Œdema cum Erythemate.*—This ſpecies of œdema is deſcribed by Mr. Pearſon as coming on ſuddenly; the patient complains of ſhivering, pain in the loins, naufea, head-ache, &c. Theſe febrile ſymptoms ſeldom continue with violence more than twelve hours; but when they remit, a ſenſe of tingling is experienced in the foot and calf of the leg, extending to the groin. The whole of the lower extremity ſwells, becomes painful, and is almoſt univerſally red; the ſkin is very tender, and all motion gives great uneaſineſs. The abſorbent glands in the groin and upper part of the thigh alſo become conſiderably enlarged. The redneſs and ſwelling commonly begin to ſubſide in three or four days, the leg and foot remaining in a very œdematous ſtate.

This diſeaſe ſometimes attacks young women, whoſe menſes are not regular; but females, not at all affected with chloroſis, may have the complaint. Men are alſo occaſionally the ſubjects of the diſorder. The perſons moſt liable to be attacked, are thoſe who are corpulent; whoſe fibres are flaccid; whoſe occupations require much ſtanding; more eſpecially when thoſe perſons drink immoderately of ſpirituous liquors.

This diſeaſe is treated in the ſame manner as the œdema puerperarum.

*Œdema Purulentum.*—This form of œdema is leſs frequent than any of the former kinds, though as ſevere as the worſt of them. It uſually begins with ſhivering, increaſed heat, accelerated pulſe, debility, and other febrile ſymptoms. Soon after this attack, the patient complains of pain in his groin; the inguinal glands are enlarged and tender; and the thigh is hot, but not at all ſwelled or diſcoloured. In a few days the knee inflames, while the leg and foot become affected with the œdema ſimplex flaccidum. In about ten or fourteen days from the commencement of the diſeaſe,

two or three indurated parts, of ſmall dimenſions, may be diſcovered in the ham and inner part of the thigh, and now the whole limb is in general highly œdematous. When one of the indurations burſts, a large quantity of pus is diſcharged.

According to Mr. Pearſon, the œdema purulentum comes on without any evident cauſe. This gentleman has hitherto ſeen it only in young perſons, who were under the age of twenty years, and of a ſcrofulous habit.

During the firſt ſtage of this complaint, diaphoretics, combined with opium, are recommended. As ſoon as ſuppuration has occurred, Peruvian bark muſt be given with opium. This medicine muſt be continued after the abſceſs has burſt, and be aſſiſted with a generous diet, and country or ſea-air. The ſulphuric acid is alſo an eligible remedy.

When the abſceſs has burſt, Mr. Pearſon recommends applying dry lint and common digeſtive, care being taken to waſh the part, at each time of dreſſing it, with Bates's camphorated lotion. A roller will alſo do good.

ŒDEMOSARCA, from οιδημα and σαρξ, *fleſh*, an œdematous ſwelling, attended with a firm, fleſhy feel.

ŒDERA, in *Botany*, named by Linnæus in honour of George Chriſtian Oeder, once profeſſor of Botany at Copenhagen, to whom the *Flora Danica* was, at its beginning, entruſted. Having completed three volumes, containing 540 plates, he reſigned the botanical chair for another appointment under the Daniſh government, when the above work was conſigned to the care of Muller, and afterwards to Vahl. The other botanical publications of this gentleman are, *Elementa Botanicæ*, publiſhed at Copenhagen, in two parts, in 1764 and 1766; *Nomenclator Botanicus*, printed in 1769; and *Enumeratio Plantarum Floræ Danicæ*, printed in 1770. Oeder was born at Anſpach in 1728, and died at the age of 63 years. Linn. Mant. 159. Schreb. 590. Willd. Sp. Pl. v. 3. 2392. Mart. Mill. Dict. v. 3. Juſſ. 189. Lamarck Illuſtr. t. 720. Gærtn. t. 172.—Claſs and order, *Syngeneſia Polygamia Segregata*. Nat. Ord. *Compoſitæ Oppoſitifoliæ*, Linn. *Corymbiferæ*, Juſſ.

Gen. Ch. *Common calyx* many-flowered, ſquarroſe, of ſeveral, lanceolate leaves, longer than the flower; the lower ones larger; containing numerous *partial calyxes* of many, chaffy, lanceolate leaves, the length of the florets. *Cor. common* radiated, of many partial flowers which are alſo radiated though placed in the common diſk. Florets of each partial diſk perfect, funnel-ſhaped, five-cleft, erect: thoſe of the radius female, ligulate, lanceolate, the length of the common calyx. *Stam.* (in the perfect florets) Filaments five, very ſhort; anthers in a cylindrical tube. *Piſt.* (in the perfect florets) Germen oblong; ſtyle thread-ſhaped; ſtigmas two, thread-ſhaped, obtuſe; in the female florets the ſtigma is longer. *Peric.* none, except the unchanged calyx. *Seeds* oblong, crowned with many ſcales; pointed and ſhorter in the perfect florets. *Recept.* Common and partial, ſcaly; the ſcales of the latter linear, deciduous.

Eſſ. Ch. Partial calyx many-flowered. Florets tubular, perfect, with one or two female, ligulate. Receptacle chaffy. Down of ſeveral ſcales.

1. O. *prolifera*. Linn. Mant. 291. Suppl. 391. Thunb. Prodr. 169. (Bupthalmum capenſe; Linn. Sp. Pl. 1274. Amœn. Acad. v. 6. 104. Berg. Cap. 297.)—Leaves oppoſite, lanceolate, fringed, ſmooth on both ſides.—Found in ſandy ſituations at the Cape of Good Hope. *Stem* ſhrubby, compound, with aſcending *branches*, covered at the lower part with ſcars from fallen *leaves*. *Leaves* oppoſite ſeſſile, narrow, acute, channelled, chiefly abounding towards the end of the branches, green. *Flowers* terminal, ſolitary, yellow. *Seeds* compreſſed, ſlightly furrowed, ſmooth, light brown.

2. O. *aliena*. Linn. Suppl. 390. Jacq. Hort. Schoenb. v. 2. 14. t. 154. Frag. Bot. 5. t. 2. f. 9. (Arnica inuloides; Vahl. Symb. 91. Banks. MSS.)—Leaves linear, downy beneath. A native alſo of the Cape, where it flowers in July and Auguſt. *Stems* two or three feet high, very leafy, round, glaucous, branched. *Leaves* numerous but ſcattered, nearly ſeſſile, acute, much ſpreading, an inch and half long, reſembling thoſe of roſemary. *Flowers* almoſt ſeſſile, terminal, ſolitary, erect, of a very ſhowy yellow, as large as thoſe of the Marigold. *Seeds* white; their down ſtraw-coloured. The whole *ſhrub* is ſcentleſs, and has rather a bitter flavour.

Linnæus remarked that this plant might poſſibly belong to ſome other genus, for that it had the appearance of *Staehelina* or *Gnaphalium* with the flowers of *Calendula*. Vahl makes it an *Arnica*, under which name it appears in the herbarium of ſir Joſeph Banks.

3. O. *hirta*. Thunb. Prod. 169. Willd. n 3.—Leaves ovate, entire, hairy.—This is alſo a Cape plant; but we know not that it is any where deſcribed or even noticed except by the authors above quoted.

OEDERAU, or Odern, in *Geography*, a town of Saxony, in the circle of Erzgebirg; 9 miles E.N.E. of Chemnitz. N. lat. 50° 48′. E. long. 13° 7′.

ŒDICNEMUS, in *Ornithology*, the name of a bird called alſo *charadrius* by Geſner and Aldrovand, and in Engliſh the *Stone* Curlew; which ſee.

OEDJONG Paca, in *Geography*, a town on the N. coaſt of the iſland of Java.

ŒDIPUS, in *Biography*, one of the ſemi-fabulous heroes of Greece, whoſe tragical adventures have been a favourite ſubject of the Grecian poets and dramatiſts; was the ſon of Laius, king of Thebes, in Bœotia, and Jocaſta, the daughter of Creon. The oracle of Apollo, according to the ancient tradition, having foretold that the ſon of Laius would be his father's murderer, he was given immediately after his birth to a ſhepherd, in order to be expoſed to wild beaſts. In this ſituation he was found by the herdſman of Polybius, king of Corinth, who brought him to his maſter: that prince educated him as his own ſon, and gave him the name of Œdipus, which referred to the ſwelling of his feet, occaſioned by their having been bored in order to hang him on the branch of a tree. When he came to adult age, he diſcovered that he was not the ſon of his reputed father, and went to the oracle of Delphos to enquire after his real parents. By the way he met with Laius at Phocis, and a quarrel ariſing between their attendants, in which the maſters took part, he had the misfortune to kill his unknown father. Another account relates that their encounter was owing to a ſedition in Phocis, in which Œdipus took a part againſt his father. He proceeded to Thebes, where his ſucceſs in expounding the enigma of the ſphinx, who is repreſented as the monſter that laid waſte the country, raiſed him to the throne and to the bed of the widow, his own mother Jocaſta. By her he had two ſons, Eteocles and Polynices. A train of circumſtances at length diſcloſed to him the parricide and inceſt of which he had been unknowingly guilty. Struck with horror at the unintentional criminality in which he had been involved, he tore out his eyes, as unworthy to behold the light, and taking ſanctuary in the grove of the furies in Attica, there ended his miſerable life. Jocaſta alſo put an end to her life, and to complete the tragedy, their ſons were diſtinguiſhed by the inveteracy of their mutual hatred. The death of Œdipus is placed by chronologiſts about the year 1228. B.C. Univer. Hiſt.

OEDMANNIA, in *Botany*, ſo called by Thunberg, in honour

honour of his countryman, the Rev. Samuel Oedmann, author of various treatiſes relating to natural hiſtory, publiſhed in Swediſh, in the Stockholm Tranſactions. Thunb. Prodr. præf. n. 46. Stockh. Tranſ. for 1800. 278. Willd. Sp. Pl. v. 3. 925. —Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, bell-ſhaped, tapering at the baſe, ſmooth and even, two-lipped. Upper lip largeſt, deeply cloven; lower ſimple, awl-ſhaped, taper-pointed. *Cor.* papilionaceous, twice the length of the calyx. Standard large, ſtalked, elliptical; heart-ſhaped at the baſe; notched, with a ſmall point, at the tip; concave, ſmooth. Wings ſtalked, half-heart-ſhaped, oblong, obtuſe, undivided, half the breadth of the ſtandard, but of the ſame length. Keel of two ſtalked, half-heart-ſhaped, acute, boat-like petals, the length of the wings. *Stam.* Filaments ten, all united into a compreſſed tube, ſeparate and curved at the top, the length of the corolla; anthers oblong. *Piſt.* Germen ſuperior, linear-lanceolate; ſtyle thread-ſhaped, curved, rather longer than the ſtamens; ſtigma ſimple. *Peric.* Legume elliptical, ſmooth. *Seeds* . . . .

Eſſ. Ch. Calyx two-lipped; upper lip cloven; lower briſtle-ſhaped. Corolla papilionaceous; petals ſtalked. Legume elliptical.

1. O. *lancea*. Thunb. Prodr. 122. Stockh. Tranſ. for 1800. 281. t. 4.—Native of the Cape of Good Hope. The *ſtem* is about a foot high, rather herbaceous than ſhrubby, aſcending, ſimple, round, brown, leafy, quite ſmooth. *Leaves* alternate, ſeſſile, lanceolate, entire, ſmooth, an inch and half long, numerous, rather crowded, and nearly erect; their baſe tapering; their point acute. *Flowers* at the top of the ſtem, axillary, ſolitary, ſtalked, ſcarcely projecting beyond the leaves. Of their colour nothing is ſaid; their ſize is about that of a Lupine. This genus ranges next after *Borbonia*, with which it altogether accords in habit. The character of the calyx is very peculiar. Thunberg makes the legume elliptical, in his full deſcription of the genus, but lanceolate in his ſhort eſſential character. The figure of the germen renders the former moſt probable. We have ſeen no ſpecimen, but the plant is very likely to be confounded in our collections amongſt *Borbonia* or *Liparia*.

OEGWA, or Agua, in *Geography*, a town of Africa, on the Gold Coaſt, ſituated, between Elmina and Cape Coaſt, on the brow of an eminence, and defended by rocks, againſt which the waves beat with the utmoſt violence, and with a noiſe that is heard at a great diſtance; or, as others ſay, entirely commanded by the cannon of Elmina. Oegwa is ſaid by Barbot to contain about 500 houſes, disjoined by narrow crooked ſtreets; and from the ſea to have the appearance of an amphitheatre. Des Marchais reduces the number of houſes to 200, in the centre of which ſtands a large ſquare building, the repoſitory of their gold duſt and other commodities. The houſes are built of earth and clay, but convenient and well furniſhed. No part of the coaſt is better provided with articles of ſubſiſtence, which are brought from the adjacent cantons, and ſold in public markets. Every thing is bought and ſold with gold duſt, which is the ſtandard of all other commodities, and brought hither in great abundance from all quarters of Fetu, Abrambo, Aſſiento, and Mandingo. Next to gold, the chief commerce of the place conſiſts in the ſale of fiſh, of which great quantities are caught on the coaſt; in which operation the inhabitants are very ſkilful. The natives, though brave and warlike, are very induſtrious in time of peace, employing their whole time in catching fiſh, or cultivating the fruits of the earth. Every day in the week, except Wedneſday, which is ſacred to the fetiche, they employ in their ſeveral occupations. Their canoes weather ſtorms which would endanger the largeſt ſhipping; and the Negroes are dextrous in availing themſelves of thoſe ſeaſons, which oblige others to diſcontinue their labours, by throwing their fiſhing-lines with the ſame ſucceſs in tempeſtuous as in calm weather.

OEI, a river of China, which diſcharges itſelf into the grand canal, in the province of Chang-tong, at Li-tchin, or Lin-tcin.—Alſo, a city of China, of the ſecond rank, in the province of Chen-ſi. N. lat. 33° 48′. E. long. 105° 39′.

OELAMPANG, a town on the E. coaſt of the iſland of Java. S. lat. 8°.

OELAND, an iſland in the Baltic, belonging to Sweden, oppoſite to Calmar, about 70 miles long and 6 broad. In the north part are ſeveral fine foreſts and ſtone quarries; but in the ſouth part the ground is more level, and adapted both to tillage and paſture. This iſland affords plenty of butter, honey, wax, and nuts. The horſes, called "klappers," are ſmall, but ſtrong and mettleſome. The king's foreſt extends over the whole iſland; and here are numbers of various kinds of deer, with hares and wild boars. Both the N. and S. parts of the iſland abound in alum-mines. The Oeland ſand-ſtein, or free-ſtone, which is harder than that of Gothland, is ſupplied by this iſland; and alſo black marble or touch-ſtone. The ſea-weed is uſed here for manure. The inhabitants, amounting to the number of 7000 at leaſt, are employed in agriculture, working in the quarries, cutting of ſtones, burning of lime, fiſhing, and navigation. The ſailors belonging to the crown are generally quartered in this iſland. The four provoſtſhips into which Oeland is divided are in the dioceſe of Calmar. N. lat. 56° 45′. E. long. 16° 20′.—Alſo, an iſland of Denmark, in the Lymfiord gulf, about five miles long, and from 1 to 2½ broad; containing three or four villages. N. lat. 57° 4′. E. long. 9° 36′.

OELETS. See Kalmucks.

OELLINGEN, or Ellingen, a town of Germany, in the circle of Franconia, which has a fine citadel belonging to the Teutonic knights, and is the uſual reſidence of the provincial commander; 20 miles S.E. of Anſpach. N. lat. 48° 59′. E. long. 10° 55′.

OELPE, a town of the duchy of Stiria; 4 miles S. of Wipperfurt.

OELS, a city of Sileſia, and capital of a principality of the ſame name. This town contains a reſidentiary palace of the prince, two Lutheran churches, a free-ſchool, and a Popiſh church. It has ſuffered much at different times by fire. The principality is bounded N. and E. by Poland, S. by the principalities of Oppeln, Brieg, and Breſlau, and W. by the principality of Wohlau. The ſoil is ſandy, and not very fertile; 14 miles E.N.E. of Breſlau. N. lat. 51° 10′. E. long. 17° 28′.

OELSEN, a town of Saxony, in the margraviate of Meiſſen; 6 miles N.E. of Launſtein.

OELSNITZ, a town of Saxony, in the Vogtland; 70 miles S.W. of Dreſden. N. lat. 50° 19′. E. long. 12° 15′.

ŒNANTHE, in *Botany*, a name adopted by old authors, which occurs in Theophraſtus and Dioſcorides, ſignifying the flower of the vine, derived from οινη, *the vine*, and ανθος, *a flower*. Tournefort applied it to the preſent genus, becauſe, he ſays, it bloſſoms at the ſame time with the vine, and becauſe its flowers reminded him of the ſmell and colour of the flowers of that plant.—Tourn. Inſt. 312. t. 166. Linn. Gen. 140. Schreb. 189. Willd. Sp. Pl. v. 1. 1440. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 317. Ait. Hort. Kew. ed. 2. v. 2. 147. Juſſ. Gen. 221. Lamarck Dict.

v. 4. 526. Illuſtr. t. 203. Gærtn. t. 22.—Claſs and order, *Pentandria Digynia*. Nat. Ord. *Umbellatæ*.

Gen. Ch. *General umbel* of not many rays; *partial* denſe, of numerous, very ſhort, or no rays. *General involucrum* ſimple, ſhorter than the umbel; *partial* ſmall, both of many leaves. *Perianth* of five, awl-ſhaped, permanent teeth. *Cor. Univerſal* unequal, radiated. Florets of the diſk perfect, with five, inflexed, heart-ſhaped, nearly equal petals; of the radius, male, with five very large, unequal, inflexed, cloven petals. *Stam.* Filaments five, ſimple; anthers roundiſh. *Piſt.* Germen inferior, oblong, furrowed; ſtyles two, awl-ſhaped, permanent; ſtigmas obtuſe. *Peric.* none, except the nearly ovate fruit, diviſible into two parts, and crowned with the perianth and ſtyles. *Seeds* two, nearly ovate, convex on one ſide and ſtriated, flat on the other, toothed at the top.

Obſ. The perianth of *Œnanthe* is more conſpicuous than in any other umbelliferous genus.

Eſſ. Ch. Flowers irregular: thoſe of the radius ſeſſile and abortive. Fruit crowned with the calyx and ſtyles; its bark corky.

1. O. *fiſtuloſa*. Common Water Dropwort. Linn. Sp. Pl. 365. Engl. Bot. t. 363. Fl. Dan. t. 846.—Root ſending forth runners. Stem-leaves pinnated, cylindrical, tubular. General involucrum, for the moſt part, wanting. —Very common in wet ditches, pools, and marſhes, flowering in July and Auguſt.—*Root* perennial, tuberous, creeping. *Stems* erect, two or three feet high, branched, round, hollow like a pipe, inflated, furrowed, ſmooth, leafy, glaucous. *Radical-leaves* immerſed, bipinnate; leaflets flat, wedge-ſhaped, and lobed: *ſtem-leaves* alternate, pinnate; leaflets and ſtalks cylindrical and hollow. *General umbel* compoſed of from three to eight partial umbels, each furniſhed with numerous, fleſh-coloured *flowers*. *Calyx-teeth* ſharp and always ſpreading.

2. O. *crocata*. Hemlock Water Dropwort. Linn. Sp. Pl. 365. Engl. Bot. t. 2313. Jacq. Hort. Vind. v. 3. 32. t. 55 —All the leaflets wedge-ſhaped, cut, nearly equal.—"Happily (ſays Dr. Smith) this very noxious plant is of rare occurrence." It grows in moiſt places about the brinks of great rivers, as the Thames and others, flowering in July.—*Root* perennial, compoſed of numerous, ovate, fleſhy knobs. *Stems* erect, from two to five feet high, branched, ſomewhat forked, leafy, round, furrowed. *Leaves* dark-green, bipinnate; leaflets all nearly ſimilar, moſtly oppoſite, ſeſſile, veiny, ſmooth. *Umbels* terminal, large, convex, of many general and partial rays. *Flowers* white, often with purpliſh ſtyles and anthers, ſlightly radiant. *Calyx* incurved.

The whole herb abounds with a fetid, yellow juice, which is extremely virulent and poiſonous, eſpecially about the root. Ehret mentions that he was affected with a giddineſs only from drawing the plant. Sir Thomas Frankland informed Dr. Smith that, to his knowledge, brood mares have died in conſequence of eating the root.

3. O. *prolifera*. Proliferous Water Dropwort. Linn. Sp. Pl. 365. Jacq. Hort. Vind. v. 3. 35. t. 62.—The marginal, partial umbels male, on elongated, branched ſtalks.—Native of Italy and Sicily. It flowers in June and July.—*Root* perennial, tuberous. *Stem* herbaceous, nearly two feet in height, upright, ſlightly branched, green, purpliſh at the baſe, angular and ſtriated. *Leaves* triply pinnate; leaflets blunt, ſubovate or roundiſh. *General umbel* conſiſting of from five to eight convex rays of white or yellowiſh *flowers*, the central partial umbel very denſe, and much larger than the reſt. *Fruit* a compact, hard, hemiſpherical head.

4. O. *globuloſa*. Globular-headed Water Dropwort. Linn. Sp. Pl. 365. Gouan. Illuſtr. 18. t. 9.—Fruit globular.—Native of Portugal, and flowering in June and July.—*Root* perennial, branched. *Stem* a foot high or more, angulated and generally purpliſh at the baſe. *Radical-leaves* ternate or quinate, ſome of the leaflets lanceolate, ſome wedge-ſhaped, veiny, ſmooth. *Stem-leaves* pinnate; leaflets ſimple, narrow, long. *Umbel* of three or four unequal rays, each compoſed of twelve or fifteen *flowers*. *Fruit* globular, ſmooth, larger than that of coriander.—Gouan obſerves that this ſpecies has a great reſemblance to *O. pimpinelloides*, but is eaſily diſtinguiſhed by not having a lanceolate, triangular outline to its leaves, nor ſo branched a ſtem.

5. O. *peucedanifolia*. Sulphur-wort Water Dropwort. Pollich. Palat. v. 1. 289. t. 3. Engl. Bot. t. 348.—Leaflets all linear. General involucrum none. Knobs of the root ſeſſile, elliptical. Found in freſh inland waters, but by no means a common plant.—It was ſent from the neighbourhood of Bedford, and Bury, to Dr. Smith, who obſerves that no other Britiſh author except Dr. Sibthorp has noticed this ſpecies, probably from having confounded it with the following *O. pimpinelloides*. The flowers appear in June.—*Root* perennial, compoſed of elliptical, ſeſſile tubers, which are much crowded together. *Stem* thickiſh, rather firm, erect, angular, round, ſtriated, leafy, not much branched. *Radical-leaves* bipinnate; *ſtem-leaves* pinnate: all the leaflets linear, acute. *General umbel* conſiſting of five or ſeven rays, of denſe, yellow or often reddiſh, *flowers*.

6. O. *pimpinelloides*. Parſley Water Dropwort. Linn. Sp. Pl. 366. Engl. Bot. t. 347.—Leaflets of the radical leaves wedge-ſhaped, cloven; thoſe on the ſtem entire, linear, very long. General involucrum of ſeveral linear leaves.—Native of ſalt marſhes in various parts of Great Britain. It flowers in July.—*Root* perennial, compoſed of many ſpindle-ſhaped, ſlender, fleſhy tubers intermixed with fibres. *Stem* erect, or aſcending, nearly cylindrical, ſtriated, ſmooth leafy. *Radical-leaves* bipinnate; thoſe of the *ſtem* pinnate. *General umbel* terminal, compoſed of ten or twelve nearly equal rays. *Flowers* white, reddiſh at the back.—This ſpecies is completely a maritime one, and though no noxious properties are attributed to it, yet the very dangerous *O. crocata* cannot fail of making the whole genus ſuſpected of being poiſonous.

Thunberg in his Prodromus, 49, and 50, enumerates five additional ſpecies of *Œnanthe*, natives of the Cape of Good Hope.—They are *O. inebrians*, *tenuifolia*, *ferrulacea*, *interrupta*, and *exaltata*. Theſe are all adopted by Willdenow.

ŒNANTHE, in *Ornithology*, a name given to ſeveral ſpecies of *Motacilla*, as the *ſtapazina*, *œnanthe*, *rubetra*, *rubicola*, *trochilus*; which ſee. See alſo FRINGILLA *Petronia*.

ŒNARIA, a name given by the ancients to aſhes prepared from the leaves, tendrils, and young ſtalks of the vine. They were accounted highly diuretic.

ŒNAS, in *Ornithology*, the name uſed by authors for the ſtock-dove, or wood-pigeon, called alſo by ſome *vinago*, ſomewhat larger than the common pigeon, but of the ſame ſhape and general colour. Its neck is of a fine changeable hue, as differently oppoſed to the light; and its breaſt, ſhoulders, and wings, are of a fine purpliſh hue, or red wine colour, from whence it has its name *vinago*. Its legs are red, and feathered a little below the joint. See COLUMBA *Œnas* and *Migratoria*.

ŒNELÆUM, οινελαιον, formed of οινος, *wine*, and ελαιον, *oil*, in *Pharmacy*, a mixture of wine and oil; uſually of thick black wine, and oil of roſes.

In fractures with wounds, where the bone is not bare,

Scultetus orders that the compreſſes, to make them ſtick, be drenched with œnelæum, to ſooth the pain, and prevent an inflammation; and the bandage to be every day moiſtened with the ſame, till the inflammation be out of all danger.

ŒNISTERIA, in *Antiquity*, ſacrifices held by the youth of Athens, before the firſt time of cutting the hair, and ſhaving the beard.

The etymology of the word, which comes from οινος, *wine*, ſhews, that the matter here offered was wine.

Theſe ſacrifices were offered to Hercules; and the quantity of what was offered was regulated by law.

ŒNOGALA, a word uſed by Hippocrates, and other of the Greek authors, to expreſs a mixture of milk and wine for immediate drinking. Others have uſed it to expreſs wine alone heated, ſo as to be juſt as warm as new milk.

ŒNOMANTIA, οινομαντεια, in *Antiquity*, a ſpecies of divination by wine, which is done by making conjectures from the colour, motion, noiſe, and other accidents of the wine of libations.

ŒNOMAUS, in *Biography*, a Greek philoſopher, who flouriſhed in the ſecond century, uſually claſſed with the Cynics, was a native of Gadara, and flouriſhed in the reign of the emperor Adrian. He wrote a treatiſe to expoſe the frauds and impoſtures of oracles, which was very ably executed, and with a degree of freedom which would not have been permitted in a Chriſtian. He wrote another treatiſe, to cenſure the degeneracy of the latter Cynics; and Suidas aſcribes to him certain treatiſes on government, and the philoſophy of Homer, as well as the biographies of Crates, Diogenes, and other Cynic philoſophers. None of his pieces have reached our times; but fragments of his work againſt oracles are preſerved in the fifth and ſixth books of Euſebius's "Evangelical Preparation." Moreri. Brucker by Enfield.

ŒNOPTÆ, a kind of officers, or cenſors, at Athens, who attended at their feaſts, regulated the number of cups each was to drink, and took care that none drank too much or too little.

Thoſe who would not be kept within the bounds of temperance, were preſented by the œnoptæ to the areopagus. The œnoptæ were alſo called *eyes*, *oculi*.

ŒNOTHERA, in *Botany*, from οινος, *wine*, and θηρα, a *ſearching* or *catching*; a name, as we learn from Theophraſtus, beſtowed upon the plant on account of its root having caught the perfume of wine from being dried; but whether our *Œnothera* be the ſame as that of Theophraſtus we are at a loſs to determine. Linn. Gen. 187. Schreb. 250. Willd. Sp. Pl. v. 2. 306. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 341. Michaux. Boreal-Amer. v. 1. 224. Juſſ. 319. Lamarck Dict. v. 4. 550. Illuſtr. t. 279. (Onagra; Tournef. t. 156. Gærtn. t. 32.)—Claſs and order, *Octandria Monogynia*. Nat. Ord. *Calycanthemæ*, Linn. *Onagræ*, Juſſ.

Gen. Ch. *Cal.* Perianth ſuperior, of one leaf, deciduous; tube cylindrical, erect, long; limb cloven into four, oblong, acute, deflexed ſegments. *Cor.* Petals four, obcordate, flat, placed at the diviſions of the calyx, and as long as its ſegments. *Stam.* Filaments eight, awl-ſhaped, incurved, inſerted into the throat of the calyx, ſhorter than the corolla; anthers oblong, incumbent. *Piſt.* Germen inferior, cylindrical; ſtyle thread-ſhaped, the length of the ſtamens; ſtigma four-cleft, thick, obtuſe, reflexed. *Peric.* Capſule cylindrical, ſquare, of four cells, and four valves; partitions contrary. *Seeds* numerous, angular, naked. *Recept.* columnar, unconnected, ſquare, its angles meeting the edges of the partition.

Eſſ. Ch. Calyx four-cleft. Petals four. Capſule of four cells and four valves, cylindrical, inferior. Seeds naked.

This is an ornamental genus of herbaceous plants, chiefly American. In the 14th edition of *Syſtema Vegetabilium* are enumerated ten ſpecies. Willdenow has fifteen, all of which may be found in the ſecond edition of the *Hortus Kewenſis*. We ſhall firſt give a few examples of theſe ſpecies.

O. *biennis*. Common Evening Primroſe. Linn. Sp. Pl. 492. Engl. Bot. t. 1534. Fl. Dan. t. 446.—Leaves ovato-lanceolate, flat. Stem rough, ſomewhat hairy. Stamens regular. Petals undivided.—This is the only Britiſh ſpecies of *Œnothera*, nor was it till very lately admitted as ſuch. It grows on the extenſive and dreary ſand-banks to the north of Liverpool, flowering from July to September. It was originally diſcovered in America, but is now naturalized almoſt throughout Europe, and is frequent in gardens. *Stem* two or three feet high, ſometimes branched, leafy, angular, rough with minute tubercles, hairy. *Leaves* alternate, ovate or lanceolate, toothed, downy; the loweſt ſtalked, longer and ſomewhat waved. *Flowers* ſeſſile in the boſoms of the upper leaves, ſo as to form a large ſpike. They are of a fine pale yellow colour, expand in the evening, and are delicately fragrant. The unfolding of the petals is ſo ſudden, that a ſort of exploſion has been heard, by ſome curious obſervers, in the ſeparation of the calyx-leaves.

O. *fruticoſa*. Shrubby Œnothera. Linn. Sp. Pl. 492. Curt. Mag. t. 332.—Leaves lanceolate, ſomewhat toothed, acute. Capſules ſtalked, oblong-club-ſhaped, angular.—Native of Virginia; flowering from June to Auguſt. *Root* perennial. *Stem* herbaceous, not really ſhrubby, three or four feet high, round, hairy, pale red. *Leaves* green on the upper ſide, glaucous beneath, tinged with red at their tips and edges. *Flowers* in cluſters, very large and ſhowy, bright yellow, expanding in the evening, but unlike moſt of the genus remaining open during the greater part of the following day. Curtis ſays "the flower-buds, the germen and the ſtalk are enlivened by a richneſs of colour, which contributes to render the ſpecies one of the moſt ornamental and deſirable of the tribe."

O. *pumila*. Dwarf Œnothera. Linn. Sp. Pl. 493. Curt. Mag. t. 355.—Leaves lanceolate, entire, obtuſe. Capſules on ſhort ſtalks, elliptically obovate, angular.—Native of North America. It flowers from May to September. *Root* perennial. *Stems* aſcending, ſcarcely a foot in height, ſmooth, reddiſh. *Leaves* ſeſſile, light green, tinged with red at their points, rather blunt. *Flowers* ſeſſile, ſpiked, ſmall, yellow, and like the laſt they remain expanded in the day as well as in the evening. This is by far ſmaller than any other Linnæan ſpecies of *Œnothera*.

O. *roſea*. Roſy-flowered Œnothera. Willd. n. 14. Curt. Mag. t. 347.—Leaves ovate, toothed; lower ones lyrate. Capſules club-ſhaped.—Native of Peru, and introduced into Europe in 1783. It flowers throughout the greater part of the ſummer. *Root* ſcarcely perennial. *Stem* about a foot in height, upright, ſmooth. *Leaves* nearly ſeſſile, pointed and tipped with red. *Flowers* ſolitary, on long ſtalks, of a bright roſe colour.

O. *purpurea*. Purple-flowered Œnothera. Willd. n. 15. Curt. Mag. t. 352.—Leaves glaucous, ſmooth, lanceolate, entire, attenuated at each end, obtuſe. Capſules ſeſſile, ovate, angular.—Native of North America, where it was diſcovered by A. Menzies, eſq. in 1794. A very ornamental ſpecies, and chiefly diſtinguiſhed by the ſoft and glaucous appearance of its foliage, the purple hue of its

bloſſoms,

bloſſoms, and the dark colour of its ſtigma. *Root* annual. *Stem* about two feet high, rather waved, ſmooth. *Flowers* ſeſſile, ſpiked, very abundant, of a rich lilac or purple colour.

The other ſpecies of *Willdenow* and the *Hortus Kewenſis* are *O. grandiflora*, *parviflora*, *muricata*, *longiflora*, *molliſſima*, *undulata*, *nocturna*, *villoſa*, *ſinuata*, aud *tetraptera*.

Michaux divides the genus into two ſections; the firſt with *elongated fruit*; and the ſecond with *ſhort acutely quadrangular fruit*. In his ſecond ſection we find the following ſpecies, which are met with in no other author. *O. glauca*, *hybrida*, *linearis*, *chryſantha*, and *puſilla*.

The following South American ſpecies of this beautiful genus are deſcribed and figured in the fourth volume of *Cavanille's Icones*.

O. *tenella*. Cavan. Ic. t. 396. f. 2.—Stem herbaceous, erect. Leaves ovate-oblong. Four of the anthers nearly ſeſſile.—Found near Chili, flowering in November. *Stem* ſix or eight inches high, generally ſimple. *Leaves* alternate, the lower ones ſmaller, rather hairy. *Flowers* axillary, ſolitary, ſeſſile, violet-coloured.

O. *tenuifolia*. Cavan. Ic. t. 397.—Leaves linear, very narrow, elongated. Petals notched.—Native country, and time of flowering, as in the laſt. *Stems* round, a foot and half high. *Branches* numerous, ſlender, ſomewhat hairy, ſmooth when old. *Leaves* alternate, longiſh, ſeſſile. *Flowers* axillary, ſolitary, nearly ſeſſile, yelloviſh-red, with dark veins.

O. *dentata*. Cavan. Ic. t. 398.—Leaves linear, toothed. Capſules very ſlender, ſquare.—Found alſo in Chili and flowering in November. *Stem* a foot or more in height, round, with alternate branches. *Leaves* alternate, ſeſſile, thickly though minutely toothed. *Flowers* axillary, ſolitary, ſeſſile, yellow, with dark veins.

O. *acaulis*. Cavan. Ic. t. 399.—Leaves pinnatifid; the terminal lobe larger, toothed.—Found alſo near Chili, flowering in November and December. *Root* thick and fibrous, from whence ſpring the ſeſſile *flowers*, and all radical *leaves*, which are ſprinkled with white hairs. *Flowers* ſeveral, very large and ſhowy, of a white or fleſh colour beautifully variegated with veins.

O. *rubra*. Cavan. Ic. t. 400.—Stem herbaceous, erect, branched. Leaves ovato-acute, ſerrulated.—The country of this ſpecies is uncertain. It was cultivated in the Royal Garden of Madrid, where it flowered in July and Auguſt 1796. *Root* annual. *Stem* a foot high, round, branched. *Leaves* alternate, ſtalked. *Flowers* axillary, ſolitary, ſtalked, of a light red colour.

This laſt appears to us, notwithſtanding the author's remarks, to be but too near akin to the *roſea* above deſcribed.

ŒNOTHERA, in *Gardening*, compriſes plants of the herbaceous, biennial, perennial, and under-ſhrubby perennial kinds; of which the ſpecies cultivated are, the broad-leaved tree-primroſe (O. biennis); the long-flowered tree-primroſe (O. longiflora); the ſoft tree-primroſe (O. molliſſima); the ſhrubby tree-primroſe (O. fruticoſa); and the dwarf tree-primroſe (O. pumila).

*Method of Culture.*—Theſe plants are all capable of being raiſed from ſeeds, and ſome of them by parting the roots and cuttings.

The ſeed ſhould be ſown either in the autumn or early ſpring, in the firſt and third ſorts, upon a bed or border in the open ground, thinning and watering the plants properly, and keeping them free from weeds till the following autumn, when they may be removed, with balls of earth about their roots, to the places where they are to remain: or ſome may be ſet out, at the time of thinning, in nurſery-rows, ſix inches apart.

They alſo riſe without trouble, from the ſcattering of the ſeeds.

But in the ſecond ſort, the ſeed ſhould be put into the ground in the open borders, or other parts, about the latter end of March, where the plants are to remain. One plant is ſufficient in a place, which ſhould have a ſtick ſet to ſupport its branches, when they have advanced a little.

The fourth ſort may be readily increaſed by ſowing the ſeeds as above, and by parting the roots and cuttings of the young branches, planting them out in the open borders, or other places where they are to grow, in the autumn, for the firſt method, and the ſpring for the latter, giving water as there may be occaſion.

And in the fifth ſort, the ſeeds ſhould be ſown in pots of light earth in the autumn, plunging them in a hot-bed frame during the winter. When the plants have attained proper growth in the ſpring, they ſhould be removed into ſeparate pots, which ſhould be protected in the following winter under a garden-frame; and ſome may be planted out in the open ground, where they often ſucceed in mild winters.

The parted roots ſhould be planted out in the ſpring, either in pots or the open ground.

The plants raiſed from ſeed are in general the beſt, as flowering more ſtrongly.

By cutting down the ſtems of the plants in the firſt year of their flowering, before they perfect their ſeeds, the plants may ſometimes be rendered more durable.

The firſt two ſorts, as has been ſeen, are biennial, and the others perennial; the former ſhould, of courſe, be raiſed annually.

They are all proper for affording ornament and variety, either in the open ground, or among other potted plants. The ſecond and third ſorts are often conſidered as greenhouſe plants, but they ſucceed well in the open ground.

ŒPATA, in *Botany*, a name by which ſome authors have called the tree which produces the fruit called *anacardium Orientale*, or the Malacca bean.

OEPEN, in *Geography*. See EUPEN.

OERI. See AWERRI.

OERL, a town of France, in the department of the Roer; 10 miles N.W. of Venloo.

OERNETZ, a town of Sweden, in Dalecarlia, where Guſtavus Vaſa found refuge, and was prevented from being betrayed, by the wife of his hoſt; 5 miles S. of Fahlun.

OERNHIELM, CLAUDIUS, frequently called *Arrhenius*, in *Biography*, hiſtoriographer to the king of Sweden, was born at Linköping in the year 1627. Having been educated in his native place, he went for farther improvement to the academy at Upſal, where he applied himſelf very diligently to polite literature, making hiſtory the principal object of his purſuit. In 1657 he was invited to accompany the count Oxenſtierna in a tour to foreign countries; and on his return to Sweden, he became teacher in the academy of Upſal, and afterwards profeſſor of logic and metaphyſics. In 1668 he was choſen profeſſor of hiſtory; and in this ſituation he exerted his talents to throw light on the hiſtory of his own country, which till that period had been involved in great obſcurity. It was at this time that government eſtabliſhed an inſtitution, denominated the College of Antiquities, of which our author was appointed a member. This afforded him an opportunity to examine all the ancient records of the kingdom; and by theſe means he collected a moſt extenſive fund of materials for the favourite object of his purſuit. In 1687 he reſigned his profeſſorſhip, and was choſen librarian to the academy,

after having been ennobled by the name of Oernhielm. In 1689 he was made "Cenſor librorum regius," and died at Stockholm in 1695. The titles of his works are given in the General Biography: of theſe the principal are, "Hiſtoriæ Suecorum Gothorumque Eccleſiaſticæ Libri iv. priores;" "Vita Illuſt. Herois Ponti de la Gardie;" "Muſarum Upſalienſium Pietas in Carolum XI. Regem Sueciæ," 1673. Oernhielm had, previouſly to his deceaſe, been appointed by the government of his country to draw up a deſcription of all the towns, pariſhes, churches, &c. in Sweden, adapted to count Dahlberg's views of them; but this work was ſuſpended by his death.

OESCH, or Oex, in *Geography*, a town of Switzerland, in the canton of Berne; 19 miles S. of Friburg.

OESEL, a rocky iſland of the Baltic, or Eaſt ſea, called in Eſthnic *Kurraſaar*, *i. e.* Crane iſland, but by the inhabitants Sarema, *i. e.* the iſland. The former name is conjectured to have been formed from the Kures, who frequently made common cauſe with the Oeſelians; and the Lettiſh denominated this iſland Sahma femme, which might be changed into Sahna femme, *i. e.* Side-land. The length of the iſland, from Palmarort to the point lying ſouth-eaſt of the light-houſe of Soarverort, is about 11½ Swediſh miles, or nearly 118 verſts. In breadth it greatly varies: its largeſt being 9½ miles, or 99 verſts; and its ſmalleſt at the iſthmus, north-eaſt of the creek of Kylla, is about 2½ verſts. The temperature of the air is moderate and ſalubrious; the ſoil being in moſt parts ſand, loam, and clay, is therefore poor; but after good manuring with cow-dung or ſea-weed, and proper culture, it produces good corn, particularly wheat, rye, and barley; in favourable ſeaſons, likewiſe oats and peaſe. In dry ſummers, the parts that are quite ſandy ſeldom yield good barley, as it then runs altogether to ſtraw. On this iſland are many beautiful flowers; and the ſtone quarries are fine, and very productive. Many large blocks of limeſtone, which have been formed into ſtatues, and ſlabs for table-monuments, &c. as well as beautiful and rare ſtones, and marble, have been obtained from this iſland. The character of the Oeſel peaſantry much reſembles that of their brethren the Eſthonians; except that the former are more cleanly and orderly, and are generally not addicted to drinking; but if they indulge to exceſs, they prefer beer to brandy. In muſic and dancing, the Oeſelians manifeſt ſuperior taſte to that of the inhabitants of the adjacent continent; tolerable airs being produced by the boors from their favourite inſtrument, the bagpipe: they have likewiſe two ſorts of dances, one called the great or high dance, and the other the little dance. Their houſes are more commodious and better adapted to health than thoſe of the Eſthonians: they have windows, and ſome begin to have chimnies. In ſome few of the rooms they have deal-floors; and thoſe of the wealthier claſs no longer burn laths for light, but uſe tallow candles; and the opulent boors along the coaſt have iron lamps with ſea-dog oil. Theſe elegancies, however, are rare. The Eſthonians and Lettiſh are furniſhed annually with an almanac in their own language; but the boors of Oeſel make their own kalendar: for which purpoſe, as they cannot write, they have ſelected certain ſigns, which they mark in an artleſs manner on ſeven narrow flat ſticks tied together by a thong, or more properly on thirteen ſides. On each ſide is a month, conſiſting of 28 days. By this kalendar they learn at once every week-day, every immoveable feſtival, and every day that is memorable among them on account of any ſuperſtitious rites; for each has its peculiar ſign. They begin to reckon every ſucceſſive year one day later than the laſt; and in the uſe of the kalendar, they follow the practice of the Hebrews, and other Oriental nations, who begin their books at that part which we deem the end, and read from right to left. Tooke's Ruſſia, vol. i.

ŒSOPHAGEUS, in *Anatomy*, an epithet applied to the arteries, &c. of the œſophagus.

ŒSOPHAGOTOMY, in *Surgery*, from οισοφαγος, *the gullet*, and τεμνω, *to cut*, the operation of making an inciſion into the œſophagus, or gullet. The circumſtances under which ſuch a meaſure ſeems neceſſary, as well as the mode of operating, are detailed in the article ŒSOPHAGUS, *Removal of foreign Bodies from.*

ŒSOPHAGUS, in *Anatomy*, from φερω, οισω, *to carry*, and φαγω, *to eat*, the membranous and muſcular tube which conveys the food from the throat to the ſtomach. See Deglutition.

ŒSOPHAGUS, *Removal of foreign Bodies from*, in *Surgery*. When an extraneous body lodges in the œſophagus, it ought either to be taken out, or forced down into the ſtomach.

1. The moſt ſimple method of executing the firſt of theſe operations, conſiſts in extracting the foreign body with the fingers, if it ſhould lie within their reach, or with forceps, the ſize and ſhape of which muſt vary according to circumſtances. If it ſhould be ſituated far down the paſſage, common forceps will not anſwer. They muſt then be made of a longer and ſtronger conſtruction, and curved like thoſe which are uſed for extracting polypi from the noſtrils. Such forceps, as well as other inſtruments, which will be preſently noticed, ſhould be carefully introduced. The patient being ſeated on a chair, with his head reſting upon the breaſt of an aſſiſtant, who is to keep it ſteady by applying his hands to the forehead, and hold it moderately back, the ſurgeon is to convey the index finger of his left hand over the baſe of the tongue, which muſt be depreſſed, and on this finger he is to conduct the forceps, obſerving to make them glide along the poſterior parietes of the œſophagus, in order that the larynx may not be at all touched, for when this happens, the latter part is irritated in a degree that always adds ſeriouſly to the patient's ſuffering.

When the foreign body has deſcended too far to be reached by the fingers or forceps, it may ſometimes be extracted with a long piece of ſtrong double wire, the extremity of which is ſhaped like a hook. This ſort of inſtrument would tear the internal membrane of the œſophagus, if it were not employed with the utmoſt caution. It has been recommended for the extraction of angular bodies. Theſe might be equally well removed, and without any riſk, by means of a flexible ſilver wire, doubled into a nooſe, and having its two ends twiſted one over the other. Some ſurgeons have made uſe of common catheters, into the eyes of which are introduced ſeveral looſe pieces of packthread. M. J. L. Petit ſuggeſted uſing, in this caſe, a whalebone probang, or long ſilver probe, at the end of which ſmall rings were placed, connected together like thoſe of a watch chain.

It was cuſtomary with the ancients to make the patient ſwallow a bit of ſponge dipped in oil, and attached to ſome thread, which paſſed through the middle of it. Fabricius Hildanus afterwards fixed the ſponge upon the end of a hollow ſilver, or copper-probe, perforated with apertures. Others conceived that the ſponge might be more conveniently introduced if it were fixed on ſomething flexible, like a long piece of whalebone. At length J. L. Petit rendered this inſtrument as ſafe as it could be made, by including the whalebone in a tube of flexible ſilver, which was conſtructed of ſpiral ſilver wire, while the ſponge was alſo faſtened by means of a wire of the ſame metal.

It may readily be conceived how bodies, whoſe form is angular, and ſubſtance ſolid, will follow the ſponge, in which their

their aſperities become engaged. Thoſe which are ſoft will not ſo eaſily do ſo, though ſome have occaſionally been drawn out, which, it was ſuppoſed, would never have been got hold of in this way. Dr. Cleghorn, a phyſician at Dublin, has related to the medical ſociety of London, an inſtance, in which he thus drew out of the œſophagus a quill, that a girl, deprived of her ſenſes, had let ſlip down this canal, in endeavouring to excite vomiting with it. One of Dr. Cleghorn's friends, apprehenſive that the quill might, from its ſize, occaſion bad conſequences, if introduced into the ſtomach, was averſe to its being forced downward; and this phyſician conceived that if the ſponge could be got far enough down the œſophagus, the moiſture would make it expand, and that the feather of the quill might get entangled in it, and ſo admit of being extracted. For greater ſafety, he paſſed two ſtrings through the ſponge, in order that he might be able to pull it out in caſe it ſhould ſlip off the whalebone.

The inſtrument was introduced twice without ſucceſs; it was then turned round with a view of making the ſponge and ſtring take better hold of the feather. The plan did not ſucceed till the third attempt, when the extraneous ſubſtance was brought up high enough to admit of being taken hold of with the fingers, after it had remained in the throat two hours. Although the patient was bled the ſame evening, inflammation took place. Hence a ſecond bleeding became neceſſary; this gave relief, and the girl recovered. If the quill had paſſed into the ſtomach, it might have occaſioned acute pains in this organ, as the author of the "Zodiacus Medico-Gallicus" obſerved in a ſinging maſter, who was troubled for two years after ſwallowing ſuch an extraneous ſubſtance. The pain was violent for ſix months; no veſtiges of the quill were noticed in the ſtools. Another perſon at Dublin informed Dr. Cleghorn that a pen had been drawn out of the œſophagus in another inſtance by the preceding means. The pen was not extracted till the third attempt; the patient afterwards felt no inconvenience, and, the next day, called upon the gentleman who had relieved him, for the purpoſe of returning thanks.

2. When the foreign body, lodged in the œſophagus, cannot be removed by the means above explained, the only plan is either to promote its deſcent into the ſtomach, or elſe to force it down into this viſcus. The firſt of theſe indications is ſaid to have been ſometimes fulfilled by giving the patient a few gentle blows on the back with the palm of the hand, and alſo by making him laugh. When he can ſwallow liquids, we are likewiſe adviſed to direct him to drink a large quantity of water at a time. Sharp bodies of ſmall ſize have occaſionally been either carried downward, or rendered eaſy of deglutition, by means of pulpy food, ſuch as pap, bouillie, peaſe ſoup, French plums peeled, freſh figs, or dried ones turned inſide out. When theſe ſimple means do not anſwer, the foreign body muſt be puſhed down into the ſtomach. Anciently, a long metallic inſtrument was employed for this purpoſe; its end was the largeſt part of it, and rounded into the ſhape of an olive, or little ball. Its uſe was continued until the end of the 17th century, and Verduc recommended it at a ſtill later period. Paré, however, made uſe of a leek, the flexible ſtalk of which allowed it to adapt itſelf to the curvature of the parts through which it had to paſs. Fabricius ab Aquapendente preferred a large ſort of wax candle, which was oiled and ſoftened by being warmed. From an apprehenſion that the leek might break in the œſophagus, and thinking that the wax candle was likely to be either too hard, or too much ſoftened, M. J. L. Petit gave up theſe means, and propoſed the employment of ſponge fixed on a piece of whalebone, which was itſelf included in a ſilver cannula as already deſcribed. At the preſent day, the ſilver tube is not uſed, and the inſtrument, in its more ſimple form, is termed by ſurgeons a *probang*.

In the foregoing obſervations, it has been ſuppoſed that the ſuffocation produced by the foreign body in the œſophagus is not extremely urgent, and that the foreign body itſelf, the angular ſhape of which is known, admits of being diſplaced, and makes no external projection. Should it be of large ſize, and ſhould the preſſure, which it makes upon the trachea, interrupt reſpiration, as happened in the caſe recorded by M. Habicot in the Mém. de l'Acad. de Chirurgie, bronchotomy is indiſpenſably requiſite, after which the means calculated for the extraction of the foreign body, or for the promotion of its paſſage down into the ſtomach, muſt be practiſed. If the extraneous ſubſtance, though of ſmaller ſize, ſhould be firmly fixed, and project outwardly, there is a poſſibility of relieving the patient by making ſuch an opening into the œſophagus as will allow the foreign body to be extracted. Verduc, to whom we are indebted for the firſt ſuggeſtion of this operation, now termed *æſophagotomy*, aſſerts that its difficulties are amply counterbalanced by the danger in which the patient is of dying in the event of its not being performed. Guattani afterwards took up the ſubject, to which his attention was excited by an occurrence which he had an opportunity of witneſſing at Rome. A man, playing with a cheſnut, threw it up into the air, and caught it in his mouth. He ſoon complained of inability to ſwallow, and was conveyed to the hoſpital of the Santo Spirito. As he could ſpeak and breathe eaſily, had vomited ſince the accident, and was intoxicated when it happened, it was not ſuppoſed that the cheſnut had been ſwallowed. Very bad ſymptoms, however, came on, and he died on the nineteenth day. Guattani opened the left ſide of the neck, below the larynx and thyroid gland, which was conſiderably ſwelled. He ſoon came to the cavity of a large abſceſs, in which the entire cheſnut was ſituated. The œſophagus was much contracted both above and below this body, and the abſceſs which it had cauſed communicated with the trachea by a gangrenous aperture in the membranous parietes of the latter tube.

The obſervations of Euſtachius, Winſlow, Haller, and Morgagni, had apprized Guattani that the œſophagus, inſtead of deſcending in a ſtraight line along the back of the trachea, inclines a little to the left, and hence the latter ſurgeon propoſed opening the neck on that ſide in the operation of œſophagotomy. The patient being ſeated on a chair, with his head carried backward, and reſting on the breaſt of an aſſiſtant, the ſurgeon is to divide the integuments, the ſubcutaneous cellular ſubſtance, and that which lies betwixt the ſterno-hyoidei and thyro-hyoidei muſcles. Theſe muſcles and the trachea are then to be ſeparated from the œſophagus by drawing the ſides of the wound away from each other by means of blunt hooks. If any large veſſel ſhould bleed, it muſt either be ſecured with a ligature, or compreſſed with the finger of an aſſiſtant. Laſtly, an opening is to be made into the œſophagus over the foreign body, which is to be extracted with the fingers, or forceps. The wound requires only ſimple dreſſings, and from ſome experiments upon dogs, it is concluded that it will readily heal. Theſe experiments were attended with no difficulty, and that which Guattani performed in the preſence of M. Faget, upon the human dead ſubject, was done with equal facility.

The French academy of ſurgery, to which Guattani preſented his reflections, had annexed to an extract from his memoir two caſes of œſophagotomy, ſucceſsfully practiſed on two living men. One inſtance was communicated by Gourſaud,

Gourſaud, a member of the academy. This fact, being detailed in a conciſe way, may be advantageouſly introduced in the preſent place. An individual ſwallowed a bone, an inch long, and ſix lines in breadth. Various endeavours were made to force it down into the ſtomach; but, as they were ineffectual, and the bone could be felt on the left ſide, Gourſaud's father made an inciſion over the foreign body, with a view of extracting it. The operation was followed by no remarkable ſymptoms. During a week, the patient took nothing by the mouth, being nouriſhed with glyſters. The hiſtorian of the academy adds, that a ſimilar operation was ſucceſsfully practiſed by a military ſurgeon, named Roland.

Extraneous ſubſtances of every kind, and eſpecially ſuch as have a ſharp figure, may elude all attempts made either to extract them, or force them down into the ſtomach. For a long while they may occaſion only ſuch inconveniences as are ſupportable, and, in the end, they may be voided by the mouth, or make their way through the parts between themſelves and the ſurface of the body, where they produce an abſceſs, from which they are diſcharged. In the firſt volume of the Memoirs of the French Academy of Surgery, M. Hevin has quoted from Hoeſteterus, a caſe, in which a young man, who, in his ſleep, had ſwallowed a piece of gold that he had put in his mouth, voided it from this part at the expiration of two years, after ſuffering a variety of complaints, and falling into a ſtate of coma, that threatened his life. The ſame author alſo cites ſome inſtances of foreign bodies, ſuch as pins, needles, and fiſh-bones, which, after lodging more or leſs time in the ſubſtance of the lungs, preſented themſelves externally, and were extracted by inciſions, which only reached through the integuments.

Amongſt the foreign bodies which ſlip into the œſophagus, there are many, which paſs through it into the ſtomach. If their ſubſtance ſhould be hard, their ſize conſiderable, and their figure ſharp, their preſence may give riſe to the utmoſt danger. Art can here afford little relief; but nature has reſources which ſeem extraordinary. The practitioner may, indeed, preſcribe oily and mucilaginous draughts, and thick ſoups, which will, in ſome meaſure, defend the alimentary canal from the rough ſurface of the extraneous ſubſtance. Perhaps, alſo, theſe means may alſo ſometimes have promoted the expulſion of the hurtful body. But nothing is clearer than that, in many of the caſes on record, they could have had no effect of the foregoing kind. A ſhoe-buckle, which a child ſwallowed in playing, has been known to be diſcharged with the ſtools. Likewiſe a ſmall tin cover, a pipe four inches in length, long pieces of the ſword blades, whole knife blades, a fork, a ſilver ſpoon, &c. after being ſwallowed, have, in different examples, been voided from the anus. But yet it frequently happens that bodies of theſe deſcriptions frequently deſtroy the patient, or cauſe abſceſſes in different parts of the abdomen, and are diſcharged with the matter. Laſtly, thoſe foreign bodies which paſs all through the inteſtinal canal, and preſent themſelves at the anus, often make their way through the coats of the rectum, and produce abſceſſes of the fundament. See Sabatier's Médecine Opératoire, tom. iii.

ŒSOPHAGUS, *Stictures of.* See STRICTURES.

ŒSOPHAGUS, *Wounds of.* See WOUNDS.

OESTRINGEN, in *Geography*, a town of the duchy of Baden; 14 miles E. of Spire.

ŒSTROMANIA, a name given by ſome authors to the uterine diſorders, which ſometimes affect young women, and is commonly called *furor uterinus.*

ŒSTRUM VENERIS. See VENERIS.

ŒSTRUS, the Gad-fly or Breeze, in *Entomology*, a genus of inſects of the order of Diptera: the generic character is as follows. The mouth has a ſimple aperture, and not exſerted; it has two feelers, each having two articulations; it is orbicular at the tip, and ſeated on each ſide in a depreſſion of the mouth; the antennæ have three articulations, the laſt of which is ſubglobular, and furniſhed with a briſtle on the fore-part, placed in two hollows on the front.

The face of this ſingular genus is broad and depreſſed; it is veſicular and glaucous, and has been thought to bear ſome reſemblance to the ape kind. The different ſpecies are extremely troubleſome and even deſtructive to horſes, ſheep, and other cattle, depoſiting their eggs in different parts of the body, and producing painful tumours and ſometimes death. The larvæ are without feet, ſhort, thick, ſoft, and annulate, and often furniſhed with ſmall hooks. There are twelve ſpecies, of ſeveral of which ſo full an account is given in our article BOTTS, that we feel it neceſſary, in this caſe, to do little more than enumerate the ſpecies, with a very brief deſcription of the ſpecific character.

Species.

* BOVIS. Wings immaculate, brown; abdomen with a black band in the middle and orange-yellow hair at the tip. It depoſits its eggs in the back of cattle under the ſkin, which, as they are changed into larvæ, produce a purulent tumour. The larva of this ſpecies is brown, and has eleven ſegments with tranſverſe, rough, interrupted lines.

* EQUI. Whitiſh, with a black band in the middle and two dots at the tip. There is a variety, of which the wings have a ſingle, oblong, black ſpot at the tip; the abdomen is covered with thick brown ferruginous hairs. This is the O. viſtuli of Fabricius.

* HÆMORRHOIDALIS. Wings immaculate, browniſh; abdomen black, the baſe white and fulvous at the tip. This inſect is about half the ſize of the laſt; the female has a black incurved appendage behind; the larva is leſs, but in other reſpects exactly like the laſt.

* VETERINUS. Wings immaculate; body ferruginous; ſides of the thorax and baſe of the abdomen with white hairs. This is the O. naſalis of Gmelin and the O. equi of Fabricius; it is leſs than the O. equi deſcribed above.

* OVIS. Wings pellucid, punctured at the baſe, abdomen variegated with black and white. This is leſs than the O. equi; the larva is white, ovate, pointed with two hooks, truncate behind, with a prominent margin, and two black reſpiratory ſcales. Above it is convex, with black lines and dots; beneath flat, with minute, rough, black dots in the middle of the ſegments.

Of all the foregoing ſpecies, which, as the aſteriſks ſhew, are to be met with in our own country, much intereſting matter will be found in the article BOTTS, already referred to. The reader is alſo referred to a valuable paper in the third volume of the Linnæan Tranſactions, in which the ſeveral ſpecies are all figured.

CUNICULI. Black; wings brown; thorax black as far as the middle, behind and baſe of the abdomen with yellowiſh hairs. It inhabits Georgia. It depoſits its eggs in the ſkins of hares and rabbits. It is twice as large as the O. bovis. The ſides of the abdominal ſegments are yellow; the body beneath is black. The larvæ are brown; every where rough, with very minute prickles.

BUCCATUS. Grey; face white, dotted with black. It inhabits Carolina, and is a large inſect.

TARANDI. The wings of this ſpecies are immaculate; thorax yellow, with a black band; the abdomen is fulvous, tipt with black. It inhabits Lapland. Depoſits its eggs on

on the back of rein-deer, which produce larvæ, that are often fatal to them.

Trompe. Wings white; body black, with cinereous hairs; thorax with a deep black band. It inhabits Lapland, and on the rein-deer.

Antilopæ. Wings with a brown band and dots; body hairy, tawny-grey; abdomen with three rows of blackiſh ſpots. It inhabits Aſia, and depoſits its eggs on the back of the antelope.

Faſciculosus. Downy, yellow; tail with three tufts of blackiſh hairs. This is a Siberian inſect.

Hominis. The body of this ſpecies is entirely brown. It inhabits South America. It depoſits its eggs under the ſkin, on the bellies of the natives. The larva, if it be diſturbed, penetrates deeper, and produces an ulcer, which frequently becomes fatal.

ŒSYPE, or ŒSYPOS, a kind of fatty mucilage, of the conſiſtence of an unguent, of a greyiſh colour, and a ſickiſh diſagreeable ſmell, drawn from the greaſy wool growing on the throats and between the buttocks of ſheep.

The word is formed from the Greek οις, *ſheep*, and σηπω, *I putrefy*, or *corrupt*; the œſype being a filthy, and as it were, corrupted matter drawn from ſheep.

This wool they waſh, boil it in water, let the lotions or decoctions ſtand for ſome time, and from the top ſkim off a fatty ſubſtance, which being ſtrained through a linen cloth, and ſet to cool, makes the œſype much uſed externally to reſolve, ſoften, and appeaſe pain.

ŒTHODES Ulcus, a term uſed by the Greek writers for ſuch ulcers as had tumid and callous lips; and as ſuch ulcers are uſually very difficult to heal, the word became afterwards appropriated to all ſorts of ulcers difficult to cure.

OETSKAIA, in *Geography*, a town of Ruſſia, in the government of Irkutſk; 40 miles N. of Irkutſk.

OETTING, New, a town of Bavaria; eight miles N.W. of Burkhauſen. N. lat. 48° 12′. E. long. 12° 38′.

OETTINGEN, or Oetting, a county of Germany, ſituated N. of the Danube, bounded E. by the duchy of Nauburg, and W. by the provoſtſhip of Elwaugen; about 30 miles long and 18 broad. The Roman Catholic and Lutheran religion are equally profeſſed in the country.—Alſo, the capital of the fore-mentioned country, ſituated on the Wernitz, the ſeat of the regency and treaſury, and containing a ſociety of arts, a grammar-ſchool, and an orphan-houſe; 14 miles S. of Anſpach. N. lat. 48° 57′. E. long. 10° 37′.

OEVARA, a town of South America, in the province of Choco; 40 miles N. of Zitara.

ŒUVRE, Fr. Opera, Ital. This word, during the laſt century, and even earlier, was uſually prefixed to each work of a muſical compoſer; as Opera prima of Corelli, Opera quinta of Vivaldi, &c. But theſe titles ſeem now leſs in conſtant uſe than formerly. In proportion as muſic approaches perfection, it loſes theſe pompous names, by which authors imagined themſelves glorified. Rouſſeau.

OEYRAS, in *Geography*, a town of Portugal, in Eſtramadura, on the Tagus; eight miles W. of Liſbon.

Oeyras, *New*, a town of Africa, in the kingdom of Angola.

OFANTO, a river of Naples, which riſes near Conza, and runs into the Adriatic; 12 miles W. of Trani.

OFARA, a town of Japan, in the iſland of Niphon, and capital of a kingdom called Fida; 100 miles N.W. of Jedo.

OFENA, a town of Naples, in Abruzzo Ultra; 14 miles E. of Aquila.

OFESCA, a town of Servia, on the N. ſide of the Danube, oppoſite Belgrade.

OFF, a nautical term, applying to the movement of a ſhip when ſhe ſails from the ſhore towards the ſea. When a ſhip is beating to windward, ſo that by one board ſhe approaches towards the ſhore, and by the other more towards the ſea, ſhe is ſaid to ſtand *off* and *on* ſhore.

Off-*Bank* of a canal, is the bank I K, (*Plate* I. *Canals*, *fig.* 15.) which is on the contrary ſide of the canal from the towing-path *lc.*; and *off-ſlope* is the ſide L I, that is oppoſite to *lc.*

OFFA, in *Biography*, king of the Mercians, one of the Saxon princes of the heptarchy, whoſe power and talents have rendered them worthy of commemoration. He ſucceeded to the throne by the general conſent of the people, after a ſucceſsful inſurrection againſt Ethelbald, an uſurper, in 755. He had ſcarcely aſcended the throne, when he exhibited an ambitious ſpirit, which was not to be reſtrained within common boundaries: he made war upon Lothaire, king of Kent, and Kenwulph, king of Weſſex. The former he defeated in a bloody battle at Otford, a village near Seven-Oaks, and reduced his kingdom to a ſtate of dependence: over the latter he gained a victory at Benſington, in Oxfordſhire, and conquering that county, together with Glouceſter, annexed both to his dominions. Theſe ſucceſſes were ſtained by his treacherous murder of Ethelbert, king of the Eaſt-Angles, and his violent ſeizing of that kingdom. This young prince, who is ſaid to have poſſeſſed great merit, had paid his addreſſes to Elfrida, the daughter of Offa, and was invited with his retinue to Hereford, in order to ſolemnize the nuptial. Amidſt the joy and feſtivity of theſe entertainments, he was ſeized by Offa, and ſecretly beheaded: and though Elfrida, who abhorred her father's treachery, had time to give warning to the Eaſt-Anglian nobility, who eſcaped into their own country, Offa, having extinguiſhed the royal family, ſucceeded in his deſign of ſubduing that kingdom. At another time he joined Kenwulph in an invaſion of Wales, by which the Britons were driven to the mountains, and obliged to abandon all the low country. For the ſecurity of his conqueſts, Offa cauſed to be dug that dyke, which ſtill bears his name, extending from the mouth of the Wye to the Dee. Offa, by his various ſucceſſes, had now become the moſt potent prince in the iſland, and was even reſpected for his power and abilities by the celebrated Charlemagne, who entered into a league of friendſhip with him. At the deſire of that ſovereign the learned Alcuin was induced by Offa to viſit his court, and devote himſelf to his ſervice. The chief reaſon why he deſired the company of Alcuin was, that he might oppoſe his learning to the hereſy of Felix, biſhop of Urgil, in Catalonia, who maintained that Jeſus Chriſt, conſidered in his human nature, could more properly be denominated the adoptive, than the natural ſon of God. This hereſy was condemned in the council of Frankfort held in 794, conſiſting of 300 biſhops. "Such," ſays Hume, "were the queſtions which were agitated in that age, and which employed the attention not only of cloiſtered ſcholars, but of the wiſeſt and greateſt princes." Either real remorſe for his crimes, or a hypocritical affectation of piety, led Offa, in his latter years, to pay an almoſt unbounded reſpect to the clergy, and to practiſe all the ſuperſtitious devotion of the times. He gave a tenth of his goods to the church, and made liberal donations to the ſee of Hereford, which city was at that time his principal reſidence. He pretended to have been directed by a viſion to the reliques of

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the proto-martyr of England, St. Alban, near Verulam, and founded a magnificent monaſtery on the ſpot. At length he made a pilgrimage to Rome, where he laviſhed great ſums to procure the papal abſolution and benediction, and agreed to an annual payment to the pope for pious and charitable purpoſes, which he raiſed by a heavy tax on his ſubjects, afterwards converted into the impoſition termed Peter-pence. Offa died in 794, after a reign of thirty-nine years of uninterrupted external proſperity. Malmeſbury, one of the beſt of the old Engliſh hiſtorians, declares himſelf at a loſs to determine whether the merits or the crimes of this prince preponderated. Hume and Henry.

Offa *Alba*, a name which Van Helmont gives to the white coagulum, ariſing from a mixture of rectified ſpirit of wine with ſpirit of urine, or ſpirit of ſal ammoniac.

Note, The ſpirit of urine muſt be diſtilled from well fermented wine, and the other muſt be well dephlegmated; elſe no offa will ariſe.

Some call it the offa alba of Paracelſus, others of Van Helmont; whence it is ſometimes called *offa Helmontiana;* but Van Helmont was not the inventor of it, but Raim. Lully, ſays Boerhaave.

The manner of making the offa alba is deſcribed by this laſt author, who obſerves it to be difficult, as it requires both liquors to be perfect, and ſome nice circumſtances to be obſerved.

Van Helmont endeavours to account for the formation of the ſtone in the bladder, from this experiment; but as Boerhaave obſerves, the offa alba has nothing in common with the ſtone.

Boerhaave recommends this mixture as a good deobſtruent, taken in Canary, faſting.

Offa's *Dyke*, in *Geography*. See *Offa's* Dyke.

OFFAK Harbour, a port on the N. coaſt of the iſland of Waygoo, on the Line. E. long. 131° 6′.

OFFELING, a town of Auſtria; 16 miles S.W. of Freyſtadt.

OFFEN. See Buda.

Offen *See*, a lake of Auſtria; 16 miles E. of St. Wolfgang.

OFFENBACH, a town of Germany, in the county of Iſenburg, on the Maine, containing two Proteſtant churches, a ſynagogue, and quay, and ſeveral manufactures; three miles E. of Frankfort on the Maine.

OFFENBURG, a town of Germany, ſituated on the Kinzeg, in the Ortenau, originally imperial. In the year 1802, it was given to the duke of Baden. The inhabitants are Roman Catholics; 24 miles S.S.W. of Raſtatt. N. lat. 48° 27′. E. long. 7° 58′.

OFFENCE, Delictum, in *Law*, an act committed againſt the law, or omitted, where the law requires it.

Offences are diſtinguiſhed into two kinds, *viz.* ſuch as are capital, and ſuch as are not. Capital offences are thoſe for which the offender is to loſe his life. Thoſe not capital, where the offender may forfeit his lands and goods; be fined, or ſuffer corporal puniſhment, or both, but not loſe his life. (Hale, P. C. 2. 126. 134.) Under capital offences are comprehended high treaſon, petit treaſon, and felony; and offences not capital include the remaining part of the pleas of the crown, and come under the title of miſdemeanours.

Some offences are puniſhable by the common law, but moſt of them by ſtatutes.

Judge Blackſtone diſtributes the ſeveral offences, which are directly or by conſequence injurious to civil ſociety, and therefore puniſhable by the laws of England, under the following general heads: firſt, thoſe which are more immediately injurious to God and his holy religion; ſecondly, ſuch as violate and tranſgreſs the law of nations; thirdly, ſuch as more eſpecially affect the ſovereign executive power of the ſtate, or the king and his government; fourthly, ſuch as more directly infringe the rights of the public or commonwealth; and, laſtly, ſuch as derogate from thoſe rights and duties, which are owing to particular individuals, and in the preſervation and vindication of which the community is deeply intereſted. To the firſt claſs belong *apoſtaſy*, *hereſy*, thoſe which affect the eſtabliſhed church, by reviling its ordinances or nonconformity to its worſhip, *blaſphemy*, profane and common *ſwearing* and *curſing*, the offence of *witchcraft*, *conjuration*, *inchantment* or *ſorcery*, that of *religious impoſtors*, *ſimony*, profanation of the Lord's day, vulgarly (but improperly) called *Sabbath-breaking*, *drunkenneſs*, and open, notorious *lewdneſs*. The ſecond claſs of offences comprehends violation of *ſafe-conducts* or *paſſports*, thoſe which affect the rights of *embaſſadors*, and the crime of *piracy*. The offences belonging to the third general diviſion are *treaſon*, *felonies* injurious to the king's *prerogative*, *premunire*, and other *miſpriſions* and *contempts*. The fourth claſs of offences may be divided into five ſpecies, *viz.* offences againſt public *juſtice*, againſt the public *peace*, againſt public *trade*, againſt the public *health*, and againſt the public *police* or *economy*. The laſt claſs includes crimes and miſdemeſnors againſt private ſubjects, which are principally of three kinds, againſt their *perſons*, their *habitations*, and their *property*. For an account of each of the offences above enumerated, and thoſe that belong to each claſs, we refer to the appropriate articles in the Cyclopædia.

OFFENHAUSEN, in *Geography*, a town of Germany, in the territory of Nuremberg; five miles N.N.W. of Altorff.

OFFERING. See Oblation, and Heave-*offering*.

Offering, *Burnt*. See Holocaust.

OFFERTORY, Offertorium, an anthem ſung, or a voluntary played on the organ, at the time the people are making an offering.

Anciently, the offertory conſiſted of a pſalm ſung with its anthem; though it is ſomewhat dubious whether the pſalm was ſung entire; St. George mentioning, that when it was time, the pope, looking at the choir who ſung it, gave the ſign when they ſhould end.

Offertory was alſo a name anciently given to the linen whereon the offerings were laid. Dr. Harris ſays, it was properly a piece of ſilk, or fine linen, wherein the occaſional oblations or offerings of each church were wrapped up.

OFFICE, Officium, in a moral ſenſe, denotes a duty; or that which virtue and right reaſon direct a man to do.

Virtue, according to Chauvin, is the purpoſe of doing well: the thing which immediately follows, or ariſes from this purpoſe, is obedience; which ſame is alſo denominated *officium:* ſo that an office is the object of an obedience to *virtue;* which ſee.

Cicero, in his diſcourſe of "offices," cenſures Panætius, who had written before him on the ſame, for omitting to define the thing or ſubject on which he wrote; yet he does himſelf fall under the ſame cenſure. He inſiſts much on the diviſion of offices, but forgets the definition. In other of his pieces we find him defining office to be an action, which reaſon requires to be done: "Quod autem ratione actum ſit, id officium appellamus."

The Greeks, he obſerves, made two ſpecies of office: *perfect*, called by them κατορθωμα; and *common*, or *indifferent*, called καθηκοι: which they define ſo, as that, what is abſolutely right, makes a *perfect* office; and what we can

only give a probable reaſon for, a *common* or *intermediate* office.

Office, in a civil ſenſe, denotes the mutual aid and aſſiſtance which men owe to one another.

Benevolence inſpires a man with an endeavour to do good offices to all mankind.

Office is alſo a particular charge, or truſt, whereby a man is authorized to do ſomething.

Loyſeau defines office a dignity attended with a public function. The word is primarily uſed in ſpeaking of the offices of judicature and policy: as, the office of a ſecretary of ſtate, that of a juſtice of peace, of a ſheriff, &c.

Offices are either venal, or not venal. *Venal* offices are thoſe bought with money; and they are ſubdivided into two kinds; viz. *dominial* and *caſual*. *Dominial*, or *offices in fee*, are thoſe abſolutely torn off, and ſeparated from the king's prerogative, ſo as not to become vacant by death, but paſſing in the nature of a fee or inheritance.

Of theſe we have but few inſtances among us, which go beyond a firſt reverſion. Among the French they are more frequent.

*Caſual* offices are thoſe given for life, by patent, commiſſion, &c., and which become vacant by the officer's death, to the king's benefit; unleſs the officer have before reſigned, or diſpoſed of it.

Office, *Alienation*, *Alternate*, *Crown*, *Jewel*, *Poſt*. See the reſpective articles.

Office, *Victualling*. See Victualling.

Office is alſo uſed for a place, apartment, or board appointed for the officers to attend in, for the diſcharge of their reſpective duties or employments.

Such are the ſecretary's office, firſt fruits office, the ſix clerks office, the paper office, ſignet office, the prothonotary's office, pipe office, king's ſilver office, exciſe office, office of ordnance, &c. See Secretary, First-*fruits*, Six Clerks, Paper, Pipe, Signet, Excise, Ordnance, &c.

Of ſuch offices, ſome are diſtinguiſhed by the name of *board*, and other of *chambers*, as the board of green cloth, &c.

Where the inquiſition obtained, the tribunal of it was called the *holy* office.

Office, in the *Canon Law*, is uſed for a benefice, which has no juriſdiction annexed to it. See Benefice.

Office is alſo uſed, in *Common Law*, for an inquiſition or inqueſt of office, which is an inquiry made by the king's officer, his ſheriff, coroner, or eſcheator, *virtute officii*, or by writ ſent to them for that purpoſe, or by commiſſioners ſpecially appointed, concerning any matter that intitles the king to the poſſeſſion of lands or tenements, goods or chattels. (Finch. L. 323, 4, 5.) This is done by a jury of a determinate number; being either twelve, or leſs, or more. Theſe inqueſts of office were more frequently in practice than at preſent, during the continuance of the military tenures amongſt us: when, upon the death of every one of the king's tenants, an inqueſt of office was held, called an "Inquiſitio poſt mortem," to inquire of what lands he died ſeiſed, who was his heir, and of what age, in order to entitle the king to his marriage, wardſhip, relief, primer-ſeiſin, or other advantages, as the circumſtances of the caſe might turn out. To ſuperintend and regulate theſe inquiries the court of wards and liveries was inſtituted by 32 Hen. VIII. c. 46; which was aboliſhed at the reſtoration of king Charles II., together with the oppreſſive tenures upon which it was founded. With regard to other matters, the inqueſts of office ſtill remain in force, and are taken upon proper occaſions; being extended not only to lands, but alſo to goods and chattels perſonal, as in the caſe of wreck, treaſure-trove, and the like; and eſpecially as to forfeitures for offences. For every jury which tries a man for treaſon or felony, every coroner's inqueſt that ſits upon a felo de ſe, or one killed by chance-medley, is, not only with regard to chattels, but alſo as to real intereſts, in all reſpects an inqueſt of office; and if they find the treaſon or felony, or even the flight of the party accuſed, (though innocent,) the king is thereupon, by virtue of this "office found," entitled to have his forfeitures; and alſo, in the caſe of chance-medley, he or his grantees are entitled to ſuch things by way of deodand, as have moved to the death of the party. Theſe inqueſts of office were deviſed by law, as an authentic means to give the king his right by ſolemn matter of record; without which he in general can neither take nor part from any thing. For it is a part of the liberties of England, and greatly for the ſafety of the ſubject, that the king may not enter or ſeize any man's poſſeſſions upon bare ſurmiſes, without the intervention of a jury. (Finch. L. 82. Gilb. Hiſt. Exch. 132. Hob. 347.) It is, however, particularly enacted by 33 Hen. VIII. c. 20. that, in caſe of attainder for high treaſon, the king ſhall have the forfeiture inſtantly, without any inquiſition of office. And as the king hath (in general) no title at all to any property of this ſort before office found, therefore it was enacted by 18 Hen. VI. c. 6. that all letters patent or grants of lands and tenements before office found, or returned into the exchequer, ſhall be void. And by the bill of rights 1 W. & M. ſt. 2. c. 2. it is declared, that all grants and premiſes of fines and forfeitures of particular perſons before conviction (which is here the inqueſt of office) are illegal and void; which indeed was the law of the land in the reign of Edward III. (2 Inſt. 48.) With regard to real property, if an office be found for the king, it puts him in immediate poſſeſſion, without the trouble of a formal entry, provided a ſubject in the like caſe would have had a right to enter; and the king ſhall receive all the meſne or intermediate profits from the time that his title accrued. (Finch. L. 325, 6.) As on the other hand, by the "articuli ſuper cartas," 28 Edw. I. ſt. 3. c. 19, if the king's eſcheator or ſheriff ſeize lands into the king's hand without cauſe, upon taking them out of the king's hand again, the party ſhall have the meſne profits reſtored to him. In order to avoid the poſſeſſion of the crown, acquired by the finding of ſuch office, the ſubject may not only have his "petition of right," which diſcloſes new facts not found by the office, and "monſtrans de droit," which relies on the facts as found; but alſo he may (for the moſt part) "traverſe" or deny the matter of fact itſelf, and put it in a courſe of trial by the common law proceſs of the court of chancery. Yet ſtill, in ſome ſpecial caſes, he hath no remedy left but a mere petition of right. (Finch. L. 324.) Theſe "traverſes," as well as the "monſtrans de droit," were greatly enlarged and regulated for the benefit of the ſubject, by the ſtatutes already mentioned and others. (34 Edw. III. c. 13. 36 Edw. III. c. 13. 2 & 3 Edw. VI. c. 8.) And in the traverſes thus given by ſtatute, which came in the place of the old petition of right, the party traverſing is conſidered as the plaintiff; and muſt therefore make out his own title, as well as impeach that of the crown, and then ſhall have judgment "quod manus domini regis amoveantur," &c. Blackſt. Com. b. iii.

From what we have delivered it appears that to traverſe an office, is to traverſe an inquiſition taken of office before an eſcheator. To return an office, is to return that which is found by virtue of the office.

There are two ſorts of offices iſſuing out of the exchequer

by commiſſion; *viz.* an office to entitle the king in the thing enquired into; and an office of inſtruction.

Office is alſo uſed for divine ſervice celebrated in public. St. Jerom is the perſon, who, at the requeſt of pope Damaſus, is ſaid to have firſt diſtributed the Pſalms, Epiſtles, and Goſpels, in the order in which they are now found in the Romiſh office. The popes Gregory and Gelaſius added the prayers, reſponſes, and verſes; and St. Ambroſe the graduals, hallelujahs, &c.

Office is more particularly uſed, in the Romiſh church, for the manner of performing the ſervice; which varies every day.

Thus they ſay the office of Sunday; the office of ſuch a ſaint, &c. The office is either *ſingle*, *half-double*, or *double*.

Office, again, is applied to a particular prayer preferred in honour of a ſaint.

When any perſon is canonized, a particular office is at the ſame time aſſigned him out of the common office of the confeſſors, the Virgin, or the like. See Saint and Canonization.

We ſay, the office of the Virgin; of the Holy Spirit; of the paſſion; the holy ſacrament, &c. The office of the dead is rehearſed every day, excepting on feaſt-days, among the Carthuſians. The office of the Holy Virgin is alſo added to the office of the day, in the order of Bernardines.

Offices, with regard to *Architecture*, denote all the apartments that ſerve for the neceſſary occaſions of a great houſe, or palace, or thoſe where the ſervants are employed: as kitchens, pantries, brewhouſes, confectionaries, fruiteries, granaries, &c. as alſo waſh-houſes, wood-houſes, ſtables, &c.

The offices are commonly in the baſſecour; ſometimes they are ſunk under ground, and well vaulted.

Office, in *Rural Economy*, the general name of any ſort of farm, building, or place where buſineſs is tranſacted relative to a farm; or for the purpoſe of containing the animals, produce, or other things belonging to the farm. The great points to be aimed at in buildings of this kind are thoſe of convenience and economy in labour. See Farm-Buildings.

Office *of Eſtate*, the name of the place where the principal buſineſs of it is tranſacted. Mr. Marſhall, in his work on landed property, ſays it ſhould be ſituated under the roof of the principal reſidence of the proprietor, round which his eſtate moſtly lies. Where much land lies detached, a ſecondary office ſhould be provided. And it may be laid down as a rule, in the management of landed property, that every diſtinct part of an extenſive eſtate ought to have a place upon it, however humble, in which the poſſeſſor may paſs a few days, to diffuſe over it a ſpirit of good order and emulation. He has known the moſt neglected, and almoſt ſavage ſpot, reclaimed, and put in a train of improvement, by this eaſy method. And hence the utility of conſolidating landed property, and throwing it into compact bodies; ſo that due attention may be conveniently paid to every part.

It is ſuggeſted that a *principal* office ſhould have a commodious buſineſs room; a ſmall anti-room, lobby, or waiting room; and a ſafe, keep, or ſtrong room, for the more valuable documents.

Concerning the kinds of furniture, with which an office of this ſort ſhould be ſupplied, they are,

1. General maps of the diſtinct parts of the eſtate, or of the different officiaries, or diſtricts, into which the more connected parts may be divided,—coloured ſo as to ſhew, diſtinctly, each farm, or the lands that are eventually intended to be laid into ſeparate farms,—with the woodlands, waters, &c. &c. in hand. And alſo ſeparate pocket-maps of the ſeveral farms, or intended farms; exhibiting, at one view, the outlines, the names, and the contents, of the different fields or pieces of land of which they are ſeverally compoſed,—and coloured agreeably to their occupancy; ſo that the ſeveral fields of the exiſting farms, (or intermixed parts of farms, intended to be united,) though ſcattered, may be readily perceived. If ſeparate columns of contents be endorſed on the backs of the maps, one of them of the intended farm, the others of the exiſting farms, or parts of farms, with their ſeveral totals ſubjoined, all the doubts and perplexity which are wont to ariſe on large eſtates, from the intermixture of farm lands, will, he thinks, be avoided. See Map.

2. The rentals and books of accounts.

3. Books of valuation; or 'field books;' namely, regiſters of the number, name, admeaſurement, and eſtimated value of each field, and every parcel of land, as well as of each cottage, or other building, not being part of a farmſtead, on the ſeveral diſtinct parts or diſtricts of the eſtate.—The valuations being inſerted in columns; as they ariſe whether by general ſurveys, or incidentally; headed with the names of their reſpected valuers; ſo that whenever a farm is to be re-let, theſe columns may be conſulted, and its real value be fixed, in a re-ſurvey, with the greater exactneſs.

4. A general regiſter of timber trees, growing on the ſeveral diviſions of the eſtate; ſpecifying the number in each wood, grove, hedge-row, and area;—with the ſpecies, number, and meaſurement, of each tree. Alſo ſeparate pocket books, containing thoſe of each diviſion; for the occaſional uſe of the manager and the wood-reeve.

5. A receptacle of ordinary papers,—ſuch as contracts, agreements, accounts, letters of buſineſs, &c.—intelligibly endorſed, dated or numbered, and arranged ſo as to be eaſily referred to. With a book of abſtracts, or heads, of papers of great importance, to be referred to on ordinary occaſions, and likewiſe to ſerve as an index to the originals, which require a more ſecure repoſitory than a common buſineſs room.

6. A ſafe repoſitory of documents; as title deeds, legal deciſions, awards of arbitration, counterparts of leaſes, paſſed accounts, &c. The moſt ſecure keep of important papers, is a ſmall room, ſtrongly arched over; having an iron door, opening into the office with a window ſhutter, alſo of iron: thus guarding the contents, on every ſide, from fire; the repoſitory of writings being inſulated; in the centre of the room. And a ſtanding regulation, reſpecting papers, whether they may be lodged in the office, or the ſtrong room, ought to be,—that no perſon be ſuffered to carry away a valuable paper, on any occaſion, without leaving in its place a receipt or memorandum, ſignifying by whom it was taken, and for what purpoſe; in order that it may be the more eaſily traced, in caſe it ſhould not be returned.

It is adviſed, that from theſe maps, books, and papers, from general ſurveys, and incidental occurrences, are to be formed pocket regiſters of the farms; correſponding, in number and ſize, with the portable books of maps. One folio, or two oppoſite pages being appropriated to each farm; ſo as to ſhew, at one view, the name of the farm and its number of acres. The name of the tenant and the exiſting rent. The tenancy; and, if on leaſe, the term of expiry. Any extraordinary covenant of the leaſe. The number of cottages let with the farm.

The number of timber trees growing upon it.
——— orchard trees growing upon it.
Alſo, the eligibility of the plan of the farm.
——— the occupier of the farm.
——— ——— the preſent rent of the farm.
The ſtate of the buildings.
——— the fences and gates.

The ſtate of the roads and water-courſes.
——— cultivation and live ſtock.
Likewiſe the repairs, more immediately wanted.
The improvements of which it is capable.
Together with ſhort notices or abſtracts of—
The agreements entered into with the tenant.
The permiſſions granted him; and
The injunctions delivered to him. With any other incident or occurrence reſpecting the farm or its occupier, that requires to be remembered: and with references to the books and papers which may pertain to the ſeveral particulars: thus having, at one view, a complete abſtract of the hiſtory, and preſent ſtate, of every farm; together with the particulars of attention which each will require. The trouble of forming an abſtract of this kind, or of renewing it, when filled, or in order to adapt it to the varying circumſtances of the ſeveral farms, is inconſiderable, compared with its uſes: which are not only obvious to theory, but are fully eſtabliſhed in practice. On returning to an eſtate, after twelve months abſence, he has generally found, that, by conſulting a regiſter of this ſort, and, through its means, making ſyſtematic enquiries, reſpecting the incidents that have occurred on the ſeveral farms, during his abſence, he has in this ſummary way, and before he entered upon a freſh view, became better acquainted, not only with the general intereſts, but with the more ordinary buſineſs, of the ſtate, than the acting manager, who had conſtantly reſided upon it, without ſuch a remembrancer: which ought not to comprehend tenanted farms, only; but ſhould compriſe woodlands, quarries, the demeſne, &c. in hand, as well as the more important improvements going on: each of which ought to have its ſeparate folio aſſigned it. It is ſtated that to a proprietor, or his confidential, who only goes over his eſtate occaſionally, ſuch an intelligent companion is eſſentially ſerviceable. He cannot profitably direct, nor ſafely adviſe with, an acting manager, or other agent, or officer of the eſtate, until he has conſulted ſo infallible an oracle. And the utility of ſuch a regiſter, while a proprietor is abſent from his eſtate, if he can be ſaid to be ſo, with ſuch a faithful mirror in his poſſeſſion, is too obvious to require explanation.

It is alſo recommended, that beſides thoſe written documents and regiſters, the office rooms of an eſtate ſhould be furniſhed with the mechanic inſtruments that are uſeful in its improvement and management: as earth borers, to ſearch for uſeful foſſils, &c. &c.; levelling inſtruments, for laying out roads and water-courſes, &c. &c. &c. Alſo models and drawings of draining mills, floodgates, farmſteads, buildings, implements, &c. &c. &c.

It is concluded that there are men who are loſing hundreds or perhaps thouſands annually by neglect or miſtaken frugality in the management of their eſtates, yet who will conſider this executive eſtabliſhment, and theſe forms and regulations of buſineſs, as unneceſſary and extravagant. Yet where the eſtates are very large, there can be no doubt theſe eſtabliſhments and regulations muſt facilitate the management of them in a very conſiderable degree, and of courſe be of eſſential advantage to thoſe who are the proprietors of them.

OFFICER, a perſon poſſeſſed of a poſt or office.

*Great* Officers *of the Crown*, or *State*, are the lord high-ſteward, the lord chancellor, the lord high-treaſurer, the lord preſident of the council, the lord privy-ſeal, the lord great chamberlain, the lord high conſtable, the earl marſhal, and lord high admiral. See Chancellor, Treasurer, Marshal, &c.

Officers *of Juſtice*, are thoſe who are entruſted with the adminiſtration of equity and juſtice in the courts thereof.

Officers, *Royal*, are thoſe who adminiſter juſtice in the king's name; as the judges, &c. See Judge.

Officers, *Subaltern*, are thoſe who adminiſter juſtice in the name of ſubjects. Such are thoſe who act under the earl marſhal, admiral, &c.

Officers *of Police*, are thoſe in whom the government and direction of the affairs of a community are inveſted. Such are mayors, ſheriffs, &c.

Officers *of War*, are thoſe who have command in the forces.

Theſe are either *general*, *field*, or *ſubaltern* officers.

Officers, *General*. See General *Officers*.

Officers, *Field*, are ſuch as have command over a whole regiment; ſuch as the colonel, lieutenant-colonel, and major.

Officers, *Subaltern*. See Subaltern.

Officers, *Commiſſion*, are ſuch as are appointed by the king's commiſſion.

Such are all from the general to the cornet and enſign, incluſive.

They are thus called in contradiſtinction to *non-commiſſioned* officers, as ſerjeant-majors, quarter-maſter-ſerjeants, ſerjeants, corporals, drum and fife-majors, who are nominated by their reſpective captains, and appointed by the commanding officers of regiments, and by them reduced without a court martial.

Officers, *Staff*, are the quarter-maſter-general, and the adjutant-general, who are ſtrictly ſaid to exiſt only in time of war: alſo, the quarter-maſters, adjutants, ſurgeons, and chaplains of regiments.

Officers, *Warrant*, are thoſe who have no commiſſions, but only warrants from ſuch boards or perſons as are authorized by the king to grant them.

Officers, *Sea*, or *officers of the marine*, are thoſe who have command in ſhips of war.

Officers, *Flag*. See Flag.

Officers *of the Houſhold*, are the lord ſteward, treaſurer of the houſhold, comptroller, cofferer, maſter, clerks of the green-cloth, &c. the lord chamberlain, vice-chamberlain, gentlemen of the privy and bed-chamber, gentlemen uſhers, grooms, pages, maſter of the wardrobe, of the ceremonies, &c. the maſter of the horſe, avenor, equerries, ſurveyors, &c. See Houshold. See alſo each officer in his proper article.

Officers, *Staff*, are ſuch as in the king's preſence bear a white ſtaff; and at other times, going abroad, have a white ſtaff borne before them by a footman bare-headed. Such are the lord ſteward, lord chamberlain, lord treaſurer, &c.

The white ſtaff is taken for a commiſſion; and at the death of the king, the officers break their ſtaff over the hearſe made for the king's body, and thereby diſcharge their inferior officers.

Officers, *Municipal*. See Municipal.

Officers, *Reformed*. See Reformed.

Officers *of the Mint*. See Mint.

Officers, *Signals for*. See Signal.

OFFICIAL, Officialis, in *Canon Law*, the biſhop's deputy or lieutenant; or an eccleſiaſtical judge appointed by a biſhop, chapter, abbot, &c. with charge of the ſpiritual juriſdiction thereof.

Of theſe there are two kinds: the one, as it were, vicar-general, of the church, exerciſing juriſdiction throughout the whole dioceſe, called by the canoniſts *officialis principalis*, in our ſtatute law the biſhop's chancellor.

There is no appeal from this court to the biſhop; his being eſteemed the biſhop's court.

The other, called *officialis foraneus*, as having his jurisdiction *foris, & extra civitatem*, is appointed by the bishop when the diocese is very large; having a certain extent of territory assigned him, wherein he resides.

This official has but a limited jurisdiction, though he have *universitatem causarum*, and exercise it in the bishop's name. Our statute-law calls him *commissary*.

The bishops, especially those of large sees, finding themselves oppressed with a multiplicity of business, at first, discharged a part of it upon their archdeacons and priests, to whom they gave commissions revocable at pleasure. These are called *vicarii*, or *officiales*.

As we do not meet with this term any where before the constitutions of the *sextus decretalium*, it is pretty apparent the custom had not its rise till the end of the thirteenth century.

In process of time the function was divided into two; and the title official given to him with whom the bishop entrusted the exercise of litigious justice; and that of vicars general, or grand vicars, to those who had the voluntary jurisdiction.

The number of officials was soon excessively multiplied; and not only bishops, but chapters and archdeacons, would have their officials.

The officials, by degrees, had drawn to their cognizance and jurisdiction most of the civil causes; till they were taken out of their hands by appeals, &c.

Official is also used, in our laws, for a deputy appointed by an archdeacon, for the executing of his jurisdiction: and he standeth in the same relation to the archdeacon as the chancellor doth to the bishop.

OFFICIALTY, the court or jurisdiction of which an official is head.

The practice of officialties is now reduced into a little compass; and actions of promises, and dissolutions of marriages, are the principal things transacted therein.

OFFICIARIIS *non faciendis, vel amovendis*, a writ directed to the magistrates of a corporation, requiring them not to make such a man an officer, or to put one out of the office he hath, until enquiry is made of his manners, &c.

OFFICINAL, formed of *officina*, a *shop*, in *Pharmacy*, a term applied to such medicines, whether simple or compound, as are required to be constantly kept in readiness in the apothecaries' shops, to be mixed up in extemporaneous prescriptions.

The *officinal simples* are appointed, among us, by the College of Physicians; and the manner of making the compositions is directed in their Dispensatory.

OFFICIO, *Suspensio ab*. See Suspension.

Officio, *Ex*. See Ex *Officio*, Information, and Oath.

Officio, *Quod clerici non eligantur in*. See Quod.

OFFIDA, in *Geography*, a town of Italy, in the marquisate of Ancona; 42 miles S.E. of Ancona.

OFFING, or Offin, in the *Sea Language*, that part of the sea that is at a good distance from shore; where there is deep water, and no need of a pilot to conduct the ship into port.

If a ship from shore be seen sailing out to seaward, they say she stands for the offing. And if a ship having the shore near her, have another a good way without her, or towards the sea, they say, that ship is in the offing.

OFFOLANKA, in *Geography*, one of the smaller Friendly islands. S. lat. 19° 35′. E. long. 185° 31′.

OFFRA, a town of Africa, on the Slave coast, where the English and Dutch have a factory; 3 miles S.W. of Jahim.

OFFRANVILLE, a town of France, in the department of the Lower Seine, and chief place of a canton, in the district of Dieppe; 3 miles S. of Dieppe. The place contains 1520, and the canton 13,286 inhabitants, on a territory of 190 kiliometres, in 34 communes.

OFF-RECKONING, in *Military Language*. See Reckoning.

OFF-SET, in *Gardening*, a sort of sucker, or small young plant, issuing from the sides of the main root of different sorts of perennial plants, whether bulbous, tuberous, or fibrous-rooted, by means of which they are often readily increased.

The method of increasing by off-sets is applicable, in general, to all sorts of bulbous and tuberous-rooted perennial plants, such as tulips, anemones, &c. in which there are small bulbs, or tubers, that on being planted out afford plants of exactly the same kind as those from which they are taken, and which, after having one or two years' growth, flower, produce seed, and furnish a supply of off-sets in their turn.

In the vast tribe of fibrous-rooted perennial plants, most sorts afford a progeny of this sort, for propagating and perpetuating their respective species and varieties, both in the flowery kind, &c. and in some esculents, but more considerably in the former; by which numerous sorts of the most beautiful flowering perennials are multiplied. Off-sets are, therefore, not only an expeditious and certain method of propagation, but one by which there is a certainty of having the desired sorts continued, whether species or particular varieties.

They have this advantage over seedlings, that the plants of the flowery kind often flower in one year; whereas seedling plants of the bulbous kinds are frequently four, five, and sometimes six or seven years before they flower in perfection. By seedlings new varieties are principally gained, the roots of which furnish off-sets, by which they are increased.

The separating off-sets may be performed in some sorts every year, in others once in two or three years, according to the sorts, and the increase of off-sets afforded by the main roots.

The proper seasons for separating or taking them off, in the bulbous and many tuberous-rooted plants, are chiefly summer and autumn, when they have done flowering, and the leaves are decayed, as at that period the roots of these sorts, having had their full growth, assume an inactive state, drawing little nourishment from the earth for a few weeks. It is also the only proper period for moving all the bulbous kinds in particular, both to separate off-sets and transplant the main roots, or to take them up for keeping a while. See Bulb.

The roots should be taken up in dry weather, if possible, and all the off-sets separated singly from the main bulb, &c. planting them in nursery-beds, in rows six inches asunder, by dibble, or in drills two or three inches deep, or in any other method that may be suitable. They should remain a year or two, according to their size, in this situation to get strength; then be transplanted, at the proper season, where they are to continue, managing them as other bulbous and tuberous-rooted plants. See Bulb and Tuber.

And the off-sets of fibrous-rooted perennial plants, may either be slipped off from the sides of the main roots as they stand in the ground, or the roots may be wholly taken up, and parted into as many slips as there are off-sets properly furnished with fibres. In this sort, the proper season is the autumn, when their stalks decay, or early in the spring, before new ones begin to shoot forth; though some hardy

sorts

ſorts may be ſlipped any time in open weather, from the autumn to the early ſpring, and others almoſt any time when they occur; planting them by dibble, the ſmaller ones in nurſery-beds, in rows ſix or eight inches aſunder, to have a year's growth; and the larger ones at once where they are to remain.

But in ſeveral ſorts of under-ſhrubby perennial plants that are capable of being increaſed by off-ſets from the bottoms, the proper ſeaſon for taking them off is the autumn and ſpring, or in the hardy kinds any time in open weather, during the autumn or early ſpring, planting them in nurſery-rows for a year or two, or till of proper ſize for the purpoſes they are deſigned for.

The off-ſets of ſucculent plants ſhould generally be ſlipped off in ſummer, and, previous to planting thoſe of the tender kinds, be laid on a dry ſhelf for ſome days, till the moiſture at bottom is dried up; then planted in pots of dry ſoil, and managed according to their different kinds and habits of growth. See SUCCULENT PLANTS.

Off-ſets are never produced from annual plants of any kind.

But the particular management that is requiſite in the different kinds is more fully explained under the culture of the plant to which it belongs.

OFF-SETS, in *Surveying*, are perpendiculars let fall, and meaſured from the ſtationary lines, to the hedge, fence, or extremity of the incloſure.

OFF-SET *Staff*, a rod, or ſtaff, of any convenient length; for inſtance, of ten links of the chain.

This ſtaff is divided into ten equal parts. Its uſe is for the ready meaſuring the diſtances from the ſtation line of things proper to be repreſented in a plan. See CHAIN.

OFF-TRACING. See CALQUING, COUNTER-*Drawing*, DESIGNING, and PENTAGRAPH.

OFF-WARD, in the *Sea Language*, the ſame with contrary to the ſhore: thus they ſay, *the ſhip heels off-ward*, when, being aground, ſhe heels towards the water-ſide; *the ſhip lies with her ſtern to the off-ward, and the head to the ſhore-ward*, when her ſtern is towards the ſea, and head to the ſhore.

OFVANAKER, in *Geography*, a town of Sweden, in the province of Helſingland; 37 miles W. of Soderhamn.

OFVERBY, a town of Sweden, in Weſt Bothnia; 32 miles N.W. of Pitea.

OGBUCKTOE, a ſettlement on the E. coaſt of Labrador. N. lat. 55° 55′. W. long. 60°.

OGDEN, SAMUEL, in *Biography*, a learned divine of the church of England, was born at Mancheſter in 1716. Having been inſtructed in grammar-learning at the free-ſchool in his native town, he was entered of King's college, in the univerſity of Cambridge, from which houſe he removed to St. John's college in the year 1736. He took his degree of B. A. in 1738, and in the following year was elected fellow of his college. In 1740 he received deacon's orders; and ſoon after was admitted to the degree of M. A. and ordained prieſt. Three years after this he was elected maſter of the free-ſchool at Halifax in Yorkſhire, which he retained till the year 1753, when he went to reſide at the univerſity of Cambridge. At the firſt Commencement, after his return, he took the degree of doctor of divinity; and on that occaſion recommended himſelf ſo ſtrongly to the duke of Newcaſtle, who was chancellor of the univerſity, by the exerciſe which he performed, that his grace preſented him to the vicarage of Damerham in Wiltſhire. In 1764 he was appointed Woodwardian profeſſor, and in 1766 was preſented to the rectory of Lawford in Eſſex, and alſo to that of Stansfield in Suffolk. Dr. Ogden had acquired great celebrity in the univerſity by the popularity of his preaching, and in 1770 he publiſhed a volume of "Sermons on the Efficacy of Prayer and Interceſſion; which being very favourably received, he printed, in 1776, another volume on the ten commandments, to which, in the following year, he added a ſecond, "On the Articles of the Chriſtian Faith." He died in the year 1778, in the ſixty-ſecond year of his age. His ſermons are ſhort, animated, and ſtriking. Sometimes the author riſes to the ſublime, and ſometimes he is diſtinguiſhed by beautiful ſtrokes of pathos. His method is deſultory; his reaſoning is not always perſpicuous; and his ſtyle, though correct and clear, is too conciſe and abrupt to be recommended as a model of good compoſition on general ſubjects. In the year 1780, Dr. Halifax publiſhed a new edition of his ſermons in two volumes octavo, with a memoir prefixed, to which the reader is referred for further particulars.

OGEE, or OG, in *Architecture*, a moulding, conſiſting of two members, the one concave, the other convex, the ſame with what is otherwiſe called *cymatium*.

Vitruvius makes each member of the ogee a quadrant of a circle; Scamozzi, and ſome others, make them ſomewhat flatter, and ſtrike them from two equilateral triangles.

The figure of the ogee bears ſome reſemblance to that of an S.

OGEE, in *Gunnery*, an ornamental moulding in the ſhape of an S, uſed in guns, mortars, and howitzes.

OGEECHEE, in *Geography*, a river of America, in Georgia; 18 miles S. of Savannah river, the courſes of which rivers are parallel to each other. It riſes near the Appalachian mountains, and diſcharges itſelf into the ſea, oppoſite to the N. end of Oſſaban iſland; 18 miles S. of Savannah.

OGELSTRÖMEN, a river of Sweden, which riſes in the mountains bordering on Norway, and runs into the Angermann, near Liden.

OGENDOW, a town of the Birman empire; 10 miles S.W. of Pegongmew.

OGERSKOI, a town of Ruſſia, in the government of Perm; 52 miles W. of Perm.

OGESIMA, a ſmall iſland of Japan, in the ſtrait between Niphon and Xicoco.

OGGIANO, a town of Italy, in the department of the Lario; 11 miles E.S.E. of Como.

OGHAM, or OGUM *Characters*, among the Iriſh antiquaries, are certain characters found on monuments, and on old writings of a cryptographic, or ſtenographic nature: theſe antiquaries contend that their origin is very remote, and that their exiſtence proves the juſtice of the claim which the Iriſh make to the uſe of letters at a period long antecedent to that when they were firſt introduced into the other Weſtern nations of Europe. In giving an account and deſcription of the Oghams, therefore, it is propoſed to comprehend a ſhort diſcuſſion on this important point of antiquarian reſearch, which, if we are not miſtaken, will lower the claims of the Iriſh to the level of juſtice, truth, and common ſenſe. Coolneſs and ſobriety of judgment are of the firſt importance and neceſſity in every antiquarian inveſtigation, but they are moſt indiſpenſably neceſſary, where objects of Celtic antiquarianiſm are involved.

According to the moſt accurate and beſt informed writers on the ſubject of Iriſh characters, there were three kinds of Ogums; firſt, Ogum beith, where *b h*, or the Iriſh letter *beith*, the firſt conſonant, is uſed inſtead of the vowel *a*. To this Ogum, the name of Ogum conſoine is given.

Harris,

Harris, in his edition of ſir J. Ware's Antiquities of Ireland, gives the following example of it.

| *a* | *e* | *i* | *o* | *u* |
|---|---|---|---|---|
| *bh* | *fc* | *ng* | *dl* | *ft* |

Sometimes conſonants were ſubſtituted for diphthongs, as in the following example:

| *ae* | *ia* | *ua* | *io* | *oi* |
|---|---|---|---|---|
| *mm* | *ll* | *bb* | *cc* | *pp* |

The ſecond kind was called Ogum coll, or the Ogum formed out of the letter *c*, to which the name of *coll* is given in the Bethluiſnion alphabet: in this kind of Ogum the letter *c* is ſubſtituted for all the vowels, diphthongs, and triphthongs, repeated, doubled, and turned in various ways. The following are examples of this ſpecies of Ogum:

| *a* | *e* | *i* | *o* | *u* |
|---|---|---|---|---|
| *c* | *cccc* | *cccc* | *cc* | *ccc* |
| *ea* | *ia* | *oi* | *io* | *ua* |
| ⊂ | ⊃ | ɔ | ⊂ | ɔɔ |

Before proceeding to the conſideration of the third kind of Ogum, it may be proper to offer a few remarks on the two ſpecies which have been juſt deſcribed.

It is ſufficiently obvious that their antiquity cannot be great; and that the uſe of them was by no means confined to the Iriſh nation, even at the earlieſt period to which it can be traced. We are informed by Suetonius, in his "Life of Julius Cæſar," and by Dio, that that emperor, when he wrote to any one what he wiſhed to be kept ſecret, always employed the fourth letter after that which he ought to have uſed; as *d* for *a*, *e* for *b*, &c.; and Suetonius and Iſidorus relate that Auguſtus had alſo a cypher which he employed in his writings, when he wiſhed them to be kept ſecret, uſing the letter following that which he ought to have employed, as *b* for *a*, and *c* for *b*: ſometimes he varied his cypher; for the letter *z*, he uſed *aa*. Indeed this cypher mode of writing, to which the two ſpecies of the Iriſh Ogums, which we have deſcribed, evidently belong, was not only well known to the Greeks and Romans, but was employed by them in various forms, and reduced to a clear and regular ſyſtem. The ancient notes or cyphers were comprehended under three heads: 1. The hieroglyphical, where the object to be underſtood was expreſſed by a ſymbol, as where a circle was put to expreſs the ſun. 2. The Tironian notes, which were ſo called from Tiro, the freedman of Cicero; in theſe a cypher or character had the power of many letters. Theſe are of great antiquity; they appear to have been borrowed by Ennius from Eaſtern and Greek archetypes, to have been greatly augmented, and uſed with great ſkill by Tiro, and finally to have been digeſted and reduced into a regular ſyſtem by Seneca. 3. Sigla, or literary ſigns; theſe were merely verbal contractions, which are found on marbles, coins, and medals. The Roman laws and proceedings were contained in theſe ſigla; and, as ſome antiquaries are of opinion, alſo in the ſecond ſort of cypher. Cicero certainly ſtates that the forms of proceſs in the Roman law were written in ſecret marks (notis); and this expreſſion points out rather the ſecond than the third ſpecies of cypher. So much intricacy and obſcurity had ariſen from the uſe of theſe cryptogamic characters, that Tribonianus, who compiled the Juſtinian code, was frequently at a loſs to diſcover their meaning; and in A. D. 533, their uſe was forbidden by an imperial edict.

Cyphers of one or other of theſe kinds were uſed wherever a Roman ſtation or colony was planted; and they were ſoon adopted by the barbarous nations whom the Romans had ſubdued. Theſe nations, or rather their prieſts, to whom alone, at this period, the knowledge of letters was confined, not only adopted the general mode of the Romans, of ſubſtituting one character for another, and thus forming a cryptographic alphabet, but they alſo mixed Roman notes and characters with their original alphabets: hence we find in the ſeventh, eighth, and ſubſequent centuries, ſo many alphabets among the Gothic and Celtic tribes, uncouth in their figure, confuſed in their order, and barbarous in their name. There is ſufficient evidence to prove that among the principal nations of both theſe tribes, their reſpective primitive alphabets were employed for ſuppoſed magical purpoſes; that a knowledge of the power and aſcribed virtue of the letters, of which it was formed, was confined to a certain order of men, by whom it was employed for theſe purpoſes; and that this order of men, after the common alphabet, by the progreſs of knowledge, would no longer ſerve theſe purpoſes, again clothed it in myſtery by the intermixture of characters borrowed from their Roman conquerors.

Cryptographic modes of writing, exactly ſimilar to the two ſpecies of Iriſh Ogums which have been deſcribed, were practiſed in all the northern countries of Europe. In the Icelandic Edda at Upſal, is an example of the firſt ſpecies of Ogum, or the Ogum conſoine, where, inſtead of the vowel, the conſonant which follows next in the alphabet is placed, as

"Dfxtfrt ſcrkptprks bfnfdkth skt pmnkbxs hprks."

Here, inſtead of *a*, *e*, *i*, *o*, *u*, *y*, the conſonants *b*, *f*, *k*, *p*, *x*, and *z* are placed, ſo that it reads thus;

"Dextera ſcriptoris benedicta ſit omnibus horis."

A ſimilar cypher was uſed by the Anglo-Saxons.

In theſe two ſpecies of Ogums, therefore, there is no trace either of antiquity or peculiarity: the third ſpecies will require a more detailed conſideration.

This third ſort is the Ogum *croabh*, or the virgular Ogum, which is thus deſcribed by Mr. Aſtle, in his "Origin of Writing," page 179, 2d edition. "It was compoſed of certain lines or marks, which derive their power from their ſituation or poſition, as they ſtand in relation to one principal line, over or under which they are placed, or through which they are drawn; the principal line is horizontal, and ſerves for a rule or guide, whoſe upper part is called the left, and the under ſide the right; above, under, and through which line, the characters or marks are drawn, which ſtand in the place of vowels, conſonants, diphthongs, and triphthongs." In a ſpecimen which he gives of Ogham writing of this kind, taken from J. Ware's Antiquities of Ireland, the cypher is very ſimple. The horizontal line is the principal, or maſter line, as it is called; and the perpendicular and diagonal lines, above, below, and through the horizontal line, ſtand for twenty letters, in four diviſions of five letters each; the conſonants are repreſented by the firſt fifteen, and the vowels by the laſt five: arbitrary marks are ſubſtituted for the diphthongs and the letter Z. Colonel Vallancey, in his Iriſh grammar, gives a ſpecimen of this kind of Ogum, in which the cypher is different from that given by ſir J. Ware, the diagonal lines ſtanding for the vowels.

That, however, there is great uncertainty reſpecting the cypher of this kind of Ogum, is evident, from the account that colonel Vallancey gives of it in another place. In a paper of this gentleman, in the 7th volume of the Archæologia,

Archæologia, to which we ſhall afterwards have occaſion to advert more at length, he confeſſes that he had erroneouſly ſaid that the Ogum characters were marked by certain ſtrokes ſtanding perpendicularly on an horizontal maſter line; but from ancient MSS. he found that the maſter line was drawn perpendicular, and the characters marked by ſtrokes perpendicular to it, over the right and left; yet in the ſame paper he gives another manner of writing the Ogum, in which horizontal ſtrokes are drawn on each ſide of a perpendicular line. Other writers give ſpecimens of circular Ogums; ſo that, if the Iriſh antiquaries are to be credited, theſe are, 1ſt, the circular mode of drawing the Ogum; 2d, the Ogum on a horizontal maſter line with perpendicular ſtrokes; 3d, the Ogum on a perpendicular maſter line with perpendicular ſtrokes; and 4th, the Ogum on the perpendicular maſter line with horizontal ſtrokes. Whatever may be the antiquity of this ſpecies of cryptographic writing, it is evident that the mode of interpreting it muſt be very looſe and ambiguous, and that no dependance can be placed on the meaning of the inſcriptions which are found in it.

But this ſpecies of Ogum is repreſented by the Iriſh antiquaries, not only as cryptographic, but as ſtenographic: how little it deſerves the latter character, may be eaſily made obvious; it requires fifteen lines or ſtrokes to expreſs the firſt five letters of the alphabet, or fifty-one for the eighteen elements of the Iriſh language. Yet this is the Ogum which colonel Vallancey aſſures us, in his Iriſh grammar, "the Iriſh antiquaries preſerved as a piece of the greateſt value, and that it was penal for any but the Druids to ſtudy or uſe it."

Sir James Ware is the firſt author who mentions the Ogum croabh, or virgular Ogum (Antiquities of Ireland, xi. 20.); he ſays, that he was in poſſeſſion of a thick MS. written entirely in this Ogum. Keyſler mentions, that in his time (1720) the earl of Carnarvon had in his library a MS. on this kind of writing, and Aſtle refers to a MS. preſented to the Britiſh Muſeum by the late Rev. Dr. Milles, dean of Exeter, preſident of the Society of Antiquaries at London, which had formerly been in the library of Henry, earl of Clarendon; among the tracts of this MS. volume, there is one entitled "(Anomymi Hiberni) Tractatus de variis apud Hibernos veteres occultis ſcribendi formulis ſeu artificiis, Hibernice Ogum dictis." From this tract, Aſtle has given a plate of the different kinds of virgular Ogums.

Notwithſtanding the direct and poſitive authority of ſir J. Ware, and the prediſpoſition of colonel Vallancey to give credit to any thing which favours or proves the claims of the Iriſh to high antiquity, the latter gentleman, for a long time, according to his own confeſſion, concluded, too haſtily, that "both ſir James and himſelf had been impoſed upon by modern bards, and that no ſuch characters ever exiſted in Pagan times." Archæologia, vii. 277.

This Ogum the Iriſh ſeanaches or antiquaries repreſent as the alphabetical character, which was regularly uſed as ſuch, and not as a cypher, by their Pagan anceſtors long before the time of St. Patrick, to whom the introduction of letters into Ireland is generally aſcribed. It is rather ſurpriſing, therefore, that before it was mentioned and deſcribed by ſir James Ware, it ſhould neither have attracted their notice, nor been the object of their reſearches. M'Curtin, a hereditary antiquarian of the county of Clare, who died about the middle of the ſeventeenth century, aſſerts in his Iriſh grammar, that he had met with no leſs than thirty-two ways of writing this Ogum, "ſo common and well known (obſerves Mr. O'Halloran, in his Hiſtory of Ireland, vol. i. p. 68.) was it *even then*." But colonel Vallancey is diſpoſed to doubt whether theſe could be all alphabetical Oghams; and referring to the plate which Mr. Aſtle has given, in his work on the origin and progreſs of writing, of ſuch Ogums as he had diſcovered in Iriſh MS. in Ireland, he gives it as his opinion, that only one is ancient; "ſome," he adds, "are the inventions of modern bards, but the moſt are ſcales of *Proſodia*, originally drawn in circles, and from thence formed into right lines, at pleaſure, to the number of 150 different ſcales, as fully deſcribed in an ancient MS in my poſſeſſion." (Archæologia, vii. 227.) From not attending to this circumſtance, the Iriſh bards fell into the miſtake, that the ancient Iriſh had ſo many different alphabets. This opinion, however, is directly oppoſite to that which is maintained by O'Flaherty, who, on the authority of Duald Firbiſs, whom he characteriſes as "the only pillar and guardian of Iriſh antiquities, while he lived; and whoſe death was an irreparable loſs to any further improvement on them," maintains that there were actually different forms of Ogum characters, of this ſpecies, to the number of one hundred and fifty; of ſeveral of which Duald Firbiſs was in poſſeſſion; and of which he wrote an account to O'Flaherty, and "of Croabh Ogham, *i. e.* virgean characters." O'Flaherty's Ogygia, tranſlated by the Rev. James Hely, vol. ii. p. 99.

Theſe various and contradictory accounts reſpecting the nature of the virgean Ogum, in conjunction with the circumſtance, that, if the account of its nature, origin, and uſe, as given by the Iriſh antiquaries, had been correct and well founded, it muſt have been often employed both in MS. and on ſtones, altars, and cromlechs, yet it could not be traced by the indefatigable zeal and perſeverance of colonel Vallancey, certainly would not eaſily or readily have yielded to a belief in its high antiquity and almoſt ſacred character, in the mind of any perſon not deeply tinctured with credulity. We have already mentioned, that colonel Vallancey was diſpoſed, at one time, to doubt of the exiſtence of ſuch an Ogum; but the vacillation of his mind, or rather his wiſh to believe, became apparent in his Iriſh grammar, where he aſks, with a ſtrong emphaſis, "ſhall we doubt the authority of ſir James Ware? ſhall we diſbelieve our eyes, when we behold Ogum inſcriptions on many remains of antiquity?" From this paſſage in his Iriſh grammar (p. 7.), it might naturally be inferred, that theſe inſcriptions had been ſeen by colonel Vallancey himſelf; no ſuch thing; for four pages afterwards, he ſays, "we are ſorry it is not in our power to quote any paſſages in our Druidic Ogum, *ſuch books having not fallen into our hands.*" Now, it can ſcarcely be maintained that there is no contradiction here, if in the paſſage firſt quoted, he meant to aſſert, that he himſelf had ſeen Ogum *inſcriptions*, becauſe in the other paſſage, he ſays, no *books* containing the Druidic Ogum had fallen into his hands: for the purpoſe of giving an example (which he laments he cannot give) the Ogum inſcriptions on the remains of antiquity, would have ſerved as well as paſſages or ſpecimens from Ogum MSS.

As, however, the very high antiquity of the virgean Ogum could not well be proved, unleſs it were found on ſome of the Iriſh monuments or altars, the reſearches of the Iriſh antiquarians were directed to them. About the beginning of the eighteenth century, a monument at New Grange, in the county of Meath, a ſhort diſtance from the river Boyne, was diſcovered: ſeveral of the rude ſtones which compoſe it are decorated with a variety of devices, circular, zigzag, and diamond-ſhaped; many of the ſtones on each ſide of the *adel* have ſimilar rude marks upon them, and one of them has ſpiral zigzags. Soon after the diſcovery of this monument, the Iriſh antiquaries proclaimed to the world, that they had found the Ogham characters; but no reſemblance to letters or characters can be traced by impartial

partial and cool obſervers; and ſir Richard Colt Hoare, in his Journal of a Tour through Ireland, expreſsly ſtates, that the marks which he obſerved on many of the ſtones bore very little reſemblance to letters, and a great ſimilarity to the ornaments that he had found in the ancient Britiſh urns diſcovered under the tumuli in Wiltſhire (p. 256.); and Mr. Edward Llhwyd, who yielded to no man in zeal for the antiquities of the Celtic tribes, while he united an uncommon degree of coolneſs and judgment with his antiquarian fondneſs and knowledge, though he deſcribes the monument at New Grange very particularly, does not even conjecture, that the rude carvings on the ſtones were letters or Ogum characters.

Colonel Vallancey, in the ſecond volume of his *Collectanea*, gives engravings of two croſſes, ſtanding in the church-yard of Caſtle Dermot, in the county of Kildare, with inſcriptions on them, which he regards as ſpecimens of the Ogum characters; theſe croſſes are ſuppoſed to bear the date of the tenth century. But it may be remarked, in the firſt place, that the claim of theſe inſcriptions to the Ogum character is very doubtful; and ſecondly, even allowing that they are in that character, and of the age aſſigned to them, the antiquity of this character does not riſe nearly up to the period of Iriſh Paganiſm; and, therefore, no proof can be grounded on theſe croſſes for the Druidic origin or uſe of the virgean Ogum; and it is not meant to be denied, that ſubſequently to the introduction of Chriſtianity, it was employed in Ireland; and probably on monuments in the tenth century, though this ſir Richard Colt Hoare is ſtrongly diſpoſed to doubt.

In the Iriſh grammar of colonel Vallancey, a paſſage is quoted from an Iriſh MS. which ſtates, that "Fiacra was mortally wounded at the battle of Caonry, his funeral leacht or ſtone was erected, and on his tomb was inſcribed his Ogum name." (P. 7.) But though this appears ſufficient evidence and guide to lead to the diſcovery of an ancient Ogum inſcription (if the monument were ſtill in exiſtence), it does not ſeem that the tomb of this hero was ſought after by any Iriſh antiquary. At laſt, about the year 1780, a diſcovery was made, which ſatisfied colonel Vallancey, and all true Iriſh antiquaries, that the virgean Ogum was a regular alphabetical character, and that it exiſted, and was in general uſe, long before the coming of St. Patrick into Ireland; having thus, in their opinion, traced back the virgean Ogum to an antiquity higher than the era of the introduction of Chriſtianity into Ireland, they ſuppoſed they had advanced a conſiderable ſtep towards putting it beyond a doubt that its origin was Druidic. This ſuppoſed diſcovery was made by Mr. O'Flanagan, at that time a ſtudent of Trinity college, Dublin; we ſhall give the ſubſtance of what he ſays, in a paper read before the Royal Iriſh Academy, on the 19th December 1785, reſpecting the circumſtances which led to the diſcovery; and the interpretations of the inſcription which he offers.

Being perfectly acquainted with the various dialects of the Iriſh language, he amuſed himſelf with reading many of the legends both in proſe and verſe; in one of the latter, aſcribed to Oſſian, he met with the following paſſage: "The fierce and mighty Conan was not in the deſperate battle of Gabhra; for in May, the preceding year, the dauntleſs hero was treacherouſly ſlain by the Fenii of Fin, at an aſſembly met to worſhip the ſun: his ſepulchral monument was raiſed in the north-weſt! His wailing dirge was ſung, and his name is inſcribed in Ogum characters on a flat ſtone, on the very black mountain of Callan."

The firſt object which Mr. O'Flanagan diſcovered on mount Callan, which is about nine miles from Ennis, was a Druid altar; but this had not the ſmalleſt traces of any characters appearing on it; though it might have been ſuppoſed, that here, if any where, the Druidic Ogum would have been engraved. At laſt his zeal was rewarded; about a mile north-eaſt of the altar, a cottager informed him, that there was a ſtone, "not unlike a tomb-ſtone, having ſtrokes engraven thereon, very unlike letters." As Mr. O'Flanagan had neglected to take his grammar with him, he was not thoroughly prepared to collect the entire ſenſe of the inſcription; but from the rules in his memory, he decyphered it in the following manner: "Fan liſi ta Conan Colgac cos-fador;" "beneath this ſtone is Conan the Fierce, the Long-legged." On his return home, and conſulting the rules given by colonel Vallancey, in his grammar, for decyphering the Ogum characters, he found the meaning to be "Fan li difica Conan Colgac cos-obmda;" beneath this ſtone is laid Conan the Fierce, the Nimble-footed. Had Mr. O'Flanagan reſted contented with this improved verſion, he could not have afforded room for entirely diſbelieving the exiſtence of Ogum characters on this monument; but anxious to prove that this kind of writing was not only very ancient, but had a wonderful ſuperiority in the comprehenſiveneſs of its meaning, to any ſet of alphabetical or ſtenographic characters known, he has afforded grounds for moſt rational and complete ſcepticiſm.

It appears from this gentleman's account, that even with the aſſiſtance of the rules contained in colonel Vallancey's Iriſh grammar, for decyphering the Ogum character, he found ſome difficulty in making out the meaning of the inſcription on this monument; and while he was muſing over it, Mr. Burton, a friend who had accompanied him to Callan, "calling to mind that the Phœnicians, from whom the Iriſh derived their origin, generally write from the right hand to the left, took the letters backwards; *i. e.* in a contrary direction from that in which we had decyphered them." By this contrivance a ſecond reading was found, which, wonderful to relate, had not only made good ſenſe, and had reference to the ſame hero, but proved a continuation of the firſt reading. A common antiquarian would have been content with theſe two readings; not ſo Mr. O'Flanagan. On his arrival in Dublin he conſulted the book of Ballemote, from which he found there were different ſcales of the Ogum character, in each of which the number of ſimilar lines, on whatever ſide drawn, did not exceed five. After having made himſelf perfectly acquainted with this ſcale, he again applied to the ſtudy of the inſcription; when he drew from it no fewer than five different meanings: the firſt has been already given; the ſecond is, "Na flida nica Conan Colgan cos-obmda;" obſcure not the remains of Conan the Fierce, the Nimble-footed: the third is, "Adm bo ſocc agloc fan oca cifa dil Naf;" long let him lie at eaſe on the brink of this lake, beneath theſe hieroglyphics, darling of the Sacred: the fourth is, "Adm bo ſocc ag loc na ſoc a cina del fan;" long let him lie at eaſe on the brink of this lake, who never ſaw his faithful clan depreſſed: the fifth and laſt is, "Almho Coſſag dos ta cu os aſit a lid cuat;" hail with reverential ſorrow the drooping heath around his lamentable tomb. On this inſcription, thus decyphered, ſo very pregnant with meaning, Mr. O'Flanagan makes the following remarks: "When all theſe various readings are united, there appears a rational beginning, continuation, and concluſion of the ſame ſenſe. But what is ſtill more remarkable, the number of readings is the limit of the number of lines in the Ogum ſcale. The whole is in the ſtile and manner of the ancients, deſcriptive both of the man and the place; and though the language be very ancient, yet it is equally familiar and eaſy to ſuch as are well

well verſed in the ſeveral idioms and dialects of the Iriſh language."

Before proceeding to offer any remarks on the Callan inſcription, and on Mr. O'Flanagan's interpretation of it, we ſhall give the rules on which he contrived to bring out of it ſuch copiouſneſs of meaning: had theſe rules been laid down in the Iriſh grammars, and in treatiſes on the decyphering of the Ogum character, and had they been illuſtrated and confirmed by examples of undoubted antiquity, the inſcription on the Callan monument, as interpreted by Mr. O'Flanagan, might have been received as a ſpecimen of the Druidic Ogum, and as a proof, not only of the great antiquity, but of the wonderful ingenuity of this mode of writing: but when we ſhall find that the rules which Mr. O'Flanagan followed in interpreting the inſcription were in the higheſt degree arbitrary, and which, if extended, might have elicited fifty meanings inſtead of five, and would go to deſtroy all certainty in language, our doubts reſpecting the Ogum character will be ſtrengthened, and by no means removed by the Callan inſcription.

In order to get the firſt and ſecond meanings, the inſcription muſt be decyphered from the broad to the narrow end of the ſtone, or from left to right; the letters F and N being interchanged, whenever they occur, as the ſenſe ſhall direct: the third and fourth readings are found by taking the two former backwards (here the proceſs is from right to left, commuting the letters F and N as before.) The fifth and laſt reading is made out "by decyphering the Ogum line from the ſmall to the broad end of the ſtone, changing its poſition that the proceſs may be from left to right. In this, neither of the letters F or N occurs, and therefore it admits of no further readings." The reaſon which led Mr. O'Flanagan to the commutation of the letters F and N, is equally whimſical and unfounded with every other ſtep in the proceſs of interpreting this inſcription. "This commutability of the letters F and N depends on a circumſtance peculiar to the Iriſh alphabet, it having two different arrangements: one of which begins with B, L, N, and is called Beithluiſnuin, and the other with B, L, F, and called Beithluisfearn; the latter is *peculiar to the Ogum ſyſtem*, but when it is neceſſary for the conſtruction, it does not totally reject the former, which was the alphabet in common uſe, until Greek and Roman literature viſited this country, and made the Iriſh arrange their alphabet, as far as it extended, conformable to their own." And in a ſubſequent page he obſerves, "obſcurity, and to contain much within a narrow compaſs, was the purpoſed end and object of the Ogum; for from the conſtruction it contains much within a ſmall ſpace, and is ultimately founded on an alphabet of different characters, which is evident even from the explication of the inſcription before us, wherein the letters F and N (which are ſeverally repreſented by three and five perpendicular ſtrokes below the horizontal maſter line) are commutable, a property which they have not in any other part of our language; this commutation depending, as has been already obſerved, on the two different arrangements of the Iriſh alphabets: and thus it is left to the reader's choice, to which of the two letters F or N, he will apply either of the aforeſaid marks, but the ſenſe will always direct him to the proper mode of application." Tranſactions of the Royal Iriſh Academy for the year 1787, vol. i. Antiquities, p. 12.

Having thus given a detailed account of the celebrated Callan inſcription, of the interpretation which Mr. O'Flanagan has given of it, and of the rules which he has followed in decyphering it, we ſhall offer a few remarks, which, if we are not miſtaken, will not only go far to diſprove the exiſtence of an Ogum inſcription on this monument, or, granting its exiſtence, the accuracy of the interpretation put upon it; but alſo the claim of the Ogum character or alphabet to Druidic invention or antiquity.

In the firſt place, Dr. Ledwich, in his Antiquities of Ireland, very pertinently and fairly aſks, "Can it be imagined that the Callan inſcription has ſtood almoſt 1500 years (for the death of Conan is ſaid to have happened in the year 295), in a naked and wild ſituation, uninjured by the tooth of time, and all the viciſſitudes of a variable climate? That the great Atlantic ocean, and its briny atmoſphere, have had no influence on this rock, and ſo far from pulveriſing its ſurface, have rendered it uſeful for vegetation?" (P. 341.) Mr. O'Flanagan, indeed, in a note to his paper (p. 14.), informs us, that from the hard texture of the ſtone the inſcription is perfectly legible; but in another place he ſays, that the ſtones of this monument are of the ſame kind as thoſe of the Druidic altar, and thoſe he expreſsly deſcribes as "gritty," certainly not a kind of ſtone likely to preſerve entire the inſcription on its ſurface. It ſhould alſo be recollected, that a ſingle eraſure of one of the cyphers, or even of part of one of the cyphers, would have been ſufficient to deſtroy, or eſſentially to alter, the meaning of any Ogum inſcription.

In the ſecond place, two engravings are given of the Callan inſcription, both by Mr. O'Flanagan; one in the ſeventh volume of the Archæologia, p. 281; and the other in the firſt volume of the Tranſactions of the Iriſh Academy (Antiquities, p. 16.) Now whoever will compare, even in a curſory and ſuperficial manner, theſe two engravings, will find that they materially differ.

In the third place, Mr. O'Flanagan in his paper in the Iriſh Tranſactions, as has been already noticed, ſays, that his firſt reading, "Fan licſi ta Conan Colgac cos-fada," was made out before he had an opportunity of conſulting colonel Vallancey's grammar, and that it was afterwards found to be erroneous; whereas, in his letters to that gentleman, publiſhed in the ſeventh volume of the Archæologia, he expreſsly ſays, "by the rules given for the Ogham croab in M'Curtin's dictionary, and your grammar, I decypher this inſcription in the following manner," *i. e.* exactly in the manner which in his paper in the Iriſh Tranſactions he declares to be erroneous, and to have been the reſult of his decyphering it from memory.

In the fourth place, though a general remark has been already offered on the very arbitrary and unfounded rules, by which Mr. O'Flanagan proceeded in the interpretation of the inſcription, yet a more detailed examination of them may be proper. Mr. O'Flanagan confeſſes that "the diſcovery of the true ſenſe of the inſcription was principally owing to the ingenious thought of Mr. Burton, with reſpect to the reading backward; which, whether it affects the ancient literary ſyſtem of this country or not, at leaſt was inſtrumental in exciting me to the ſearch, which I ſhould otherwiſe have been apt to neglect; for finding one ſenſible reading, it is probable I ſhould not have thought of tracing it farther *than the rules in our grammars might direct*, and thoſe I find are totally inſufficient." (Iriſh Tranſactions, Antiquities, p. 16.) Here is a full and complete acknowledgment, that his mode of interpreting the inſcription was entirely arbitrary; and as the rules laid down in the grammars for the interpretation of the virgean Ogum, muſt be ſuppoſed to have been drawn from all the known varieties of this mode of writing, Mr. O'Flanagan's method muſt be regarded, not only as arbitrary, but as utterly unfounded

and unſupported. It is even deſtitute of any ſupport which might be derived from the ſuppoſed Phœnician origin of the Iriſh nation; for though this circumſtance, if well eſtabliſhed, might render it highly probable that the Iriſh would imitate their anceſtors in writing from the right-hand to the left, it could never juſtify the concluſion, that becauſe the Phœnicians wrote in this manner, therefore the Iriſh, in the third century, both retained this mode, and followed the weſtern mode of writing from the left-hand to the right.

Mr. O'Flanagan appears to have been ſuſpicious of the ſoundneſs of the opinion ſuggeſted by his friend Mr. Burton; and therefore applied to Mr. O'Connor, an "antiquarian of credit," who decides very peremptorily on the ſubject.

"That the Mileſian family," ſays he, "imported letters into Ireland, and that their anceſtors learned them from the Phœnicians, I am certain; and Mr. Burton judged well in averring that our earlieſt ſcribes wrote from the right-hand to the left, but they changed to the more commodious manner of writing from the left to the right, and laid aſide the uncouth crooked character of the Phœnicians, when the beautiful Greek and Roman characters were made known here in the fourth and fifth centuries." P. 15.

On the Mileſian origin of the Iriſh nation, and on the Phœnician origin of the Mileſians, it is not here neceſſary to ſay any thing; but on the other poſitions, or rather aſſertions, of Mr. O'Connor, a few remarks may be offered. He aſſerts that the earlieſt Iriſh ſcribes wrote from the right-hand to the left: in proof and defence of this aſſertion he does not offer a ſingle argument or authority; and indeed that would have been impoſſible, for all the Iriſh MSS. are written from the left-hand to the right, and there is not the ſmalleſt trace of any evidence that they ever wrote in any other manner. It can hardly be expected, therefore, by the moſt warm admirer of Mr. O'Connor's antiquarian knowledge, that his bare and unſupported aſſertion ſhould be admitted againſt all other evidence on this ſubject. But Mr. O'Connor, in his zeal to make out his point, unfortunately proves too much; according to him, the Iriſh ſcribes changed to the more commodious mode of writing from the left to the right, at the ſame time that they adopted the beautiful Greek and Roman characters, *i. e.* "in the fourth and fifth centuries." But if this new mode of writing was not adopted till the fourth or fifth centuries, what becomes of the genuineneſs of the inſcription on the monument of Conan, who is ſaid to have been buried A.D. 295. Mr. O'Flanagan cannot ſurely expect that all his modes of reading and interpreting the inſcription ſhould be allowed him, if he agrees with Mr. O'Connor that the earlieſt ſcribes wrote from the right to the left-hand, and that the other mode was not brought into uſe till the fourth and fifth centuries; he muſt either give up the genuineneſs of the inſcription, or two of his modes of reading it. If, on the other hand, he adheres to the general opinion, and to the evidence of all MS. and other inſcriptions, that the uſual mode of writing was from the left to the right, he muſt loſe the advantage of the third and fourth readings; and, conſequently, the comprehenſiveneſs of the inſcription which he ſo much admires will be conſiderably curtailed, and the obſervation which he makes, that "the number of readings is the limit of the number of lines in the Ogum ſcale," will fall to the ground. It may be remarked alſo, that in order to get out the fifth and laſt reading, he is obliged to have recourſe to another unauthorized and arbitrary mode of proceeding: inſtead of decyphering the Ogum line from the broad to the narrow end of the ſtone, he decyphers it from the ſmall to the broad end; but as this, if no other contrivance were alſo uſed, would neceſſarily only give the reading, found out by reverſing the firſt and ſecond readings, he at the ſame time changes the poſition of the ſtone that the proceſſes may be from left to right; ſo that by this mode thoſe cyphers which were properly below the horizontal maſter line, become above it, and *vice verſâ*; and as the letters repreſented by the Ogum cyphers depend upon their poſition above or below this line, he thus gets a new ſet of letters altogether. Certainly, if theſe liberties of tranſpoſing letters were allowed and uſed by Iriſh antiquarians in general, they might make out whatever ſuited their fancy, or hypotheſis from any inſcription or MS.: but who could put faith in their interpretation?

Fifthly. Hitherto the remarks which have been offered go more againſt the interpretation of this inſcription, and againſt its alleged antiquity, than againſt the claim to Druidic origin, maintained for the Ogum cypher, by the Iriſh antiquarian. Another plan which Mr. O'Flanagan deviſed for getting out all the meaning, as he conceived, of this inſcription, will offer us very concluſive arguments on this latter point, at the ſame time that it will ſtill farther prove the arbitrary and unfounded nature of the rules he followed, and the futility of his interpretation.

None of the firſt four readings would be made out if the letters F and N, wherever they occur, were not commuted; but for this commutation no authority is given: it ſeems to have been entirely a thought of Mr. O'Flanagan's, in order to make out ſome meaning from this inſcription, or at leaſt, ſuch a meaning as ſhould prove the monument to be that of Conan; for, be it obſerved, he does not commute them in every caſe, but only "as the ſenſe ſhall direct." Can any thing be conceived more looſe and unſatisfactory than this? It was, indeed, neceſſary that Mr. O'Flanagan ſhould limit the rule he himſelf had laid down; for had the letters F and N been commuted in every inſtance where they occur in this inſcription, the name of Conan would not have been found, either in the firſt or ſecond readings; and as it does not occur in the third, fourth, or fifth readings, the monument might have been that of any other hero, as well as Conan's. So completely does Mr. O'Flanagan follow his rule of commuting the letters F and N, only as the ſenſe ſhall direct, that in the word Conan the firſt *n* is got by retaining that letter, and the ſecond *n*, by commuting the Ogum mark for *f* into that letter.

"This commutability," obſerves Mr. O'Flanagan, "of the letters F and N, depends on a circumſtance peculiar to the Iriſh alphabet, it having two different arrangements; one of which begins with B, L, N, and is called Beithluiſnuin; and the other with B, L, F, and is called Beithluisfearn; the latter is peculiar to the Ogum ſyſtem, but when it is neceſſary for the conſtruction, it does not totally reject the former, which was the alphabet in common uſe, till Greek and Roman literature viſited this country, and made the Iriſh arrange their alphabet, as far as it extended, conformable to their own." This paſſage, though given before, is quoted again, as it ſuggeſts ſeveral moſt important remarks. It is here aſſerted that the Ogum ſyſtem, when it is neceſſary for the conſtruction, does not totally reject the Beithluiſnuin alphabet. But why has Mr. O'Flanagan confined the commutability of the alphabets to the letters F and N? Had the arrangement of the two alphabets agreed in the order of all the letters except theſe, it might have been proper ſo to confine the commutability; but in the order of ſeveral other of the letters, the arrangement is different: but this

circumſtance did not ſuit Mr. O'Flanagan's hypotheſis to mention or apply. It may be added, that had the commutability been carried to its legitimate length (allowing it to be well founded), fifty readings inſtead of five might have been made out of this inſcription.

In the paſſage juſt quoted, Mr. O'Flanagan ſtates a fact which is completely deciſive againſt the Druidic origin and antiquity of the Ogum cypher; this cypher is arranged according to the alphabet called Beithluisfearn, but does not totally reject the alphabet called Beithluiſnuin: now the latter was the alphabet in common uſe until Greek and Roman literature viſited Ireland, when the former alphabet was adopted. It follows, therefore, that the Ogum cypher, having been adapted to an alphabet confeſſedly poſterior in its origin to the introduction of Chriſtianity into Ireland, cannot claim an antiquity greater than that alphabet. Had it been more ancient, it would naturally have been adapted to the more ancient alphabet, though after the introduction of the more modern one, it occaſionally, or, in ſome inſtances, might have been applied to the latter; but as the direct reverſe is the fact, as the Ogum ſyſtem is radically founded on the modern alphabet, while it only does not reject the ancient one, its date muſt be conſidered as contemporary with, at the higheſt, but more probably poſterior to that alphabet, which was introduced into Ireland along with Greek and Roman literature.

The high antiquity, and even the Druidic origin of the Iriſh Ogum, as well as of their alphabet, is contended for on other grounds beſides thoſe which are derived from monumental inſcriptions and old MSS. The Druids, it is aſſerted, had the uſe of letters from the earlieſt period, to which we can trace this order of men; and their letters were formed upon the ſyſtem of ſymbolical ſprigs, which may ſtill be traced in the virgean Ogum, and Beithluiſnuin alphabet of the Iriſh. Of this alphabet, O'Flaherty, in his Ogygea, gives a particular deſcription. "Each letter borrowed its appellation from trees." The book of Lucan, upon whoſe genuineneſs and authority Iriſh antiquaries lay great ſtreſs, though Mr. Aſtle affirms it is only 380 years old, and abounds ſo greatly in fables and abſurdities, that an intelligent reader would as ſoon believe any of the tales related in it, as that the Mileſian colony taught the uſe of letters in Ireland many centuries before the Chriſtian era (p. 121, 122.) gives the following account of the number, order, and name of each letter in the alphabet.

*B.* 1. *Beithe*, the birch-tree

*L.* 2. *Luis*, commonly *Caerthean*, the wild aſh.

*F.* 3. *Fearn*, the alder, of which ſhields are made.

*S.* 4. *Sail*, the willow.

*N.* 5. *Nion*, vulgarly *Unſioun*, the aſh-tree of which ſpears are made.

*H.* 6. *Huath*, vulgarly *See*; white-thorn, or thorny buſhes, that grow on hedges.

*D.* 7. *Duir*, vulgarly *Cuilcaun*, the ſcarlet oak, broom, holm, or holly.

*T.* 8. *Tinne*. The explanation of this letter is not given.

*C.* 9. *Coll*, the hazle.

*Q.* 10. *Queirt*, vulgarly *Abholl*, the apple-tree.

*M.* 11. *Muin*, vulgarly *Fineamhuin*, the vine-tree.

*G.* 12. *Gort*, vulgarly *Fidheaun*, the ivy.

*Ng.* 13. *Ngedal*, vulgarly *Gilcach*, or *Raid*, the reed.

*P.* 14. *Pethpoc*. There is no explanation of this.

*Z.* 15. *Ztraif*, vulgarly *Draighean*, the ſloe-tree.

*R.* 16. *Ruis*, vulgarly *Trom*, the alder-tree.

*A.* 17. *Ailm*, vulgarly *Gius*, the fir-tree.

*O.* 18. *Onn*, vulgarly *Aiteann*, furze.

*U.* 19. *Ur*, vulgarly *Fræch*, heath or ling.

*E.* 20. *Eadhadh*, vulgarly *Craneriothach*, the aſpen-tree.

*I.* 21. *Idho*, or *Idhad*, vulgarly *Ibhar*, the yew-tree.

*Ea.* 22. *Ebhadh*, vulgarly *Criothach*, the aſpen-tree.

*Oi.* 23. *Oir*, vulgarly *Feords*; the ſpindle-tree, or prick-wood.

*Y.* 24. *Uillean*, vulgarly *Eadhlean*, woodbine, or honey-ſuckle.

*Io.* 25. *Iphin*, vulgarly *Spirian*, or *Iſpin*, the gooſeberry-tree.

*X.* 26. *Amhancholl*. The explanation of this letter is not given.

Before proceeding to a direct and formal examination of the Druidic antiquity and origin of this alphabet, one remark may be offered, which, of itſelf, independently of other proof, is ſufficient, in the minds of calm and rational enquirers, to create conſiderable doubts on this point. It will be obſerved that the name of the fourth letter in the Bethluiſnuin alphabet is *ſail*, the willow: he muſt be a ſturdy etymologiſt, indeed, who will contend that this is a primitive Iriſh word, and not a derivative, from the Latin *ſalex*.

But we have a direct and poſitive evidence that the Druids did not make uſe of letters, at leaſt for the purpoſes of religion. Cæſar expreſsly ſays, "neque fas eſſe exiſtimo aut ea litteris mandare; cum in reliquis fere rebus, publicis privatiſque rationibus, *Græcis* literis utantur." The word *Græcis* has by many critics been ſuppoſed to be an interpolation, but it would appear without ſufficient authority. Mr. Aſtle remarks, "that the ancient Gauliſh letters are derived from the Greek, and their writing approaches more nearly to the Gothic than that of the Roman: this appears by the monumental inſcription of Gordian, meſſenger of the Gauls, who ſuffered martyrdom in the third century, with all his family. Theſe ancient Gauliſh characters were generally uſed by that people before the conqueſt of Gaul by Cæſar, but after that period the Roman letters were gradually introduced." (P. 57.) The Roman letters appear to have taken place of the Grecian, or Gauliſh, in Britain about the time of Tiberius; for on a coin of Cunobeline, king of the Caſſii and Trinovantes, who flouriſhed in the reign of that emperor, the letters are decidedly Roman. Now, if the Druids had poſſeſſed an alphabet of their own, it is to be ſuppoſed that it would have been uſed, and not a foreign alphabet on the coins of the Britiſh monarch. When Celſus oppoſed the antiquity and learning of the Druids to thoſe of the Jews, Origen, in reply, denied that there were any writings of the Druids in exiſtence; a denial he would hardly have made had they been as remarkable for their learning and writings, as the Iriſh and other Celtic etymologiſts would have us to ſuppoſe.

Nor are the proofs of the primitive nature and high antiquity of the Iriſh alphabet, drawn from other ſources, better founded. One of theſe proofs is thus ſtated by Mr. O'Halloran, in his "Introduction to the Study of the Hiſtory and Antiquities of Ireland," p. 29. "As a new inſtance of the originality of our characters, we may add that our letters in ancient times were called Feadha, alluding to wood: our Ogum, or hierographic character, is to this day called Ogum croabh, or the branchy type, and every letter in our common alphabet alludes to ſome tree. Our earlieſt writings were on the tablets of birch-tree, called Orauin, and the collected pieces Taibhle-Fileadh, or Philoſophical Tablets. It was to this cuſtom undoubtedly that Horace alluded, when he ſtyled the firſt compoſition of laws, engraving them on wood, leges incidere ligno." It is ſcarcely poſſible to read this proof of the originality of the Iriſh characters,

without a ſmile of credulity and contempt: the very terms uſed to expreſs the collected pieces, are evidently derived from another language, either from the Latin and Greek directly, or from the Engliſh; *Taibhle-Fileadh* bears too cloſe a reſemblance to philoſophical tables, to be regarded as a pure and primitive Iriſh expreſſion. But independently of this circumſtance, what does this pretended proof of the originality of the Iriſh characters amount to? They were engraven on wood, the terms expreſſing them had reference to wood, and therefore they were not borrowed. The reverſe of the inference would have been more rational and probable; for in the primitive ſtate of moſt languages, the ſame was the caſe; and the Anglo-Saxon language, from which there is good reaſon to ſuppoſe the Iriſh borrowed their alphabetical characters, had expreſſions of nearly ſimilar meaning, applied to their alphabet. Indeed in all the northern languages, there is a reference in the word uſed to expreſs an alphabet, to the cuſtom of cutting the letters on wood. In Icelandic, Runa Stafr is an alphabet; and the word Bog-ſtav, or Buch-ſtab, is uſed in Germany to ſignify a letter: this is evidently derived from bog, or buch, a beech-tree, and from ſtav, or ſtab, a ſtaff or ſtick.

But on this point, it is needleſs to add any thing to the opinion and teſtimony of Mr. Aſtle, contained in the following paſſages. "It appears that the Iriſh have neither written monuments nor coins to prove their pretenſions to the uſe of letters, at ſo early a period as they contend for. The tables of wood upon which they are ſaid to have written, no author of any authority ever pretended to have ſeen. But the evidence which we might have expected to have derived from ancient MSS. is defective, indeed; for the oldeſt Iriſh manuſcript which we have diſcovered is the pſalter of Caſhel, written in the latter end of the 10th century." P. 120.

"Mr. Innes, in his "Eſſay on the Antiquities of Scotland and Ireland," and Mr. James Macpherſon, in the third edition of his "Introduction to the Hiſtory of Great Britain and Ireland," produce inconteſtible evidence to invalidate the reports of the Iriſh. Theſe authors contend that Ireland was firſt peopled from Britain; that the former nation was ſo far from being the ſeat of polite learning for many years before the neighbouring nations, or even Greece itſelf had emerged from ignorance, as hath been pretended, that they were generally deemed, by the moſt reſpectable writers of antiquity, to have been leſs civilized than any of their neighbours: that the manners of the old Iriſh were inconſiſtent with the knowledge of letters: that the Ogum was a ſpecies of ſtereography, or writing in cypher; and they thus conclude with deciſive proofs againſt the pretended literature of the ancient Iriſh. They invalidate the accounts of the emigration of the Mileſian colony, and diſpute their pretended extraction from any of the nations of Scandinavia. Great ſtreſs hath been laid, as appears above, by the advocates for the antiquity of letters among the Iriſh, that their alphabet differs from all others in name, order, number, and power. Theſe arguments were adopted by thoſe who contended for the antiquity of the Runic letters, which have been confuted. Mr. Innes, in his eſſay above quoted, p. 446, delivers it as his opinion, that the *Beth*, *Luis*, *Nion*, or alphabet of the Iriſh, was nothing but an invention of the Iriſh ſeanachies, who, after they received the uſe of letters, put the Latin alphabet into a new arbitrary order, and aſſigned to each letter the name of ſome tree; and that this was not a genuine alphabet of the Iriſh in ancient times, or peculiar to them; but was a bare inverſion of the Latin alphabet." P. 122.

"To conclude this head, it is impoſſible to ſay whether all which hath been advanced will operate upon the minds of thoſe of the Iriſh nation, who are ſuperſtitiouſly devoted to the legendary tales of their anceſtors, for it is in vain to oppoſe rational doubts, arguments, or even facts, to popular credulity; although we may with great reaſon ſuppoſe, that the fictions which the vanity and patriotiſm of the Iriſh have been raiſing for ages, will gain no credit with the ſenſible and judicious part of mankind, but will vaniſh before the ſtrong beams of hiſtory and criticiſm: in truth, all ſcepticiſm muſt vaniſh by an inſpection of the 22d plate, wherein we have ocular demonſtration that the Erſe and Iriſh characters are the ſame; and that they are ſimilar to thoſe uſed by the Saxons in Britain, appears from ſeveral Saxon alphabets in the preceding plates; ſo that thoſe who obſtinately perſiſt in aſſerting that the Iriſh characters are not derived from the Roman, after what hath been ſaid on this head, muſt deny the evidence of their ſenſes." P. 138.

But the Iriſh borrowed not only their regular alphabet, but alſo one ſpecies at leaſt of their Ogums: the conſideration of this ſpecies, as more nearly allied to alphabetical characters than the virgular Ogum, we have left to the preſent place; but it will not detain us long. This ſpecies was called the *Marcomannic Runes;* an engraving of them is given by Dr. Ledwich in his "Antiquities of Ireland," p. 329. It might have been ſuppoſed that both the name and the epithet applied to theſe characters, would have ſatisfactorily proved, that the Iriſh had borrowed them from the northern nation: but Mr. O'Halloran contends that the occult manner of writing employed by the northern nations, to which the name *Runic* was given, was not only of Iriſh origin, but that the name *Runic* is purely Iriſh, and cannot be explained in the northern languages. It cannot, indeed, be denied that *run*, in Iriſh, ſignifies ſecreſy, or myſtery; but it has the ſame ſignification in the northern langnages. On this point Dr. Ledwich remarks; "The word and its meaning muſt have been adopted from the northern, for it could not co-exiſt in the Teutonic or Gothic, and Celtic, in ſimilar letters and import, unleſs we aſſert theſe tongues to he the ſame. As all know they were not, then we muſt have had it from the northern invaders of this iſle, and to them is to be attributed the loſs of the old Celtic name *Ogum* for that of *Run*, introduced by them. O'Brien, treating of this word, without any deſign of doing ſo, confirms the truth of what is aſſerted, hy ſhewing, that in five dialects of the Teutonic, it is preſerved in its original ſignification." P. 332.

The following circumſtance ſtill farther illuſtrates and confirms the idea, that the Iriſh term *run* is derived from the Teutonic dialects, and that from the northern nations, the Iriſh borrowed at leaſt ſome ſpecies of their ſecret characters. The Runes of the northern nations were ſuppoſed, by a particular mode of uſing them, to be poſſeſſed of magical qualities; and the underſtanding and application of theſe qualities were confined to the prieſts and prieſteſſes: of the latter, Keyſler gives a very full and curious account (Antiquitates Septentrionales, p. 371.), and informs us that they were called *Alirunee;* but according to O'Brien (Iriſh Dictionary, *in voce*) *Alarunaighe*, in the Iriſh language, is the wiſe man acquainted with ſecrets. The Marcomannic Runes, therefore, employed by the Iriſh, as well as the term *run*, may fairly be conſidered as of Teutonic origin.

The following are the general concluſions which may be drawn from the authorities and arguments brought forward in this article.

1. That the virgular Ogum cannot have an origin prior to the introduction of Greek and Roman literature into Ireland, ſince it is adapted to an alphabet, the arrangement of which took place at that time.



2. That

2. That the Iriſh alphabets bear ſtrong marks of having been borrowed from the Anglo-Saxon inhabitants of England. The alphabet called Bobeloth is regarded as the oldeſt, and Dr. Ledwich remarks, that "the names and figures of the letters are exactly in the ſtyle of the Britiſh, Runic, and Marcomannic runes," and this, the plate he has given of it ſufficiently proves: the form of the letters in the Bethluiſnuin alphabet is ſtill more palpably derivative and modern.

3. That the Iriſh claim to literature, in very early periods of their hiſtory, and eſpecially their claim to Druidic literature, is utterly unfounded.

With reſpect to the mode of aſcertaining the comparative antiquity of MS., written in the virgular Ogum, Mr. Aſtle informs us that "Diphthongs are not found in the ancient MSS.: the vowels are written ſeparately, as *a e*, not *æ*, &c. therefore an Ogham or cypher with marks for diphthongs is not ancient." (P. 189.) Mr. Aſtle adds, that king Charles I. correſponded with the earl of Glamorgan, when in Ireland, in the Ogham cypher, a ſpecimen of which he gives in his thirty-firſt plate. Some of this coreſpondence is preſerved among the royal letters in the Harleian library.

Iriſh etymology is ſuch delicate ground to tread upon, and it offers, in general, ſo little that is ſatisfactory, or uſeful, that we ſhould conclude this article without examining into the derivation of the word *Ogum*, did it not throw light, as we conceive, on a curious, and little underſtood paſſage in one of Lucian's dialogues.

It is rather ſurpriſing that ſuch an undaunted and ſanguine Iriſh antiquarian and etymologiſt as colonel Vallancey ſhould aſſert (Iriſh Grammar, p. 4.), "that authors are at a loſs for the derivation of the word Ogum, which is not to be found in any dictionary of the Iriſh." That it is not to be found in them is very true; and (as has been already remarked) as the word *Run*, even in the oldeſt MSS., is uſed to ſignify ſecret writing, and not the word *Ogum*, this is a proof that, even in very remote times, the mode and practice of this kind of writing was borrowed by the Iriſh from the northern nations. But though the word *Ogum* is not to be found in Iriſh dictionaries, it exiſted in the old Celtic: it ſtill exiſts in the kindred dialect of the Welſh; and in both theſe languages its meaning is certain, and appropriate to its application at preſent in the Iriſh language. Keyſler (Antiq. Septen. p. 38.) expreſsly ſtates, "probe noverim, vocabulum *Oga*, Ogum, vel Ogma Celte ſignificaſſe ſecreta literarum, vel literas ipſas." And Rowland, in his Mona Antiqua, p. 238, ſays, it is ſtill preſerved in the Welſh.

But Mr. O'Flanagan (Iriſh Tranſactions, p. 13.) traces its origin and meaning ſtill farther back in the Iriſh language. The fundamental rules of the Ogum are given in five circles, drawn at certain intervals within each other; a diagram of which, taken from the Book of Ballymotte, he gives in page 16. Hence he derives the word Ogum from Oc, Ogh, or Ogha, a circle; and he adds, "as the lines of which it is compoſed evidently refer to an alphabet already exiſting, by this word (Ogum) in our language is underſtood an obſcure character, or an occult manner of writing."

Without laying much ſtreſs on this attempt to trace the word *Ogum* ſtill farther back in the Iriſh language, it ſeems evident that it is a Celtic term, which formerly exiſted in this language, though now loſt, except in its application to the cyphers which go under that name. O'Halloran, however, in his zeal to prove this point, goes even beyond the common degree of Iriſh etymological ignorance or raſhneſs, in the following paſſage, in his Introduction to the Study of the Hiſtory and Antiquities of Ireland, p. 38. "We have a recent evidence that the word came from Ireland; for William Halloran, head of the nominals at Orford, the contemporary and great opponent of our Scotus, is better known amongſt ſchoolmen by the name of William of Ocham, and Ogham, than by his real name of O'Halloran; the name of Ogham being given him by his countrymen, on account of his great knowledge in this occult writing, and in which, Ware declares, he was poſſeſſed of an entire book wrote in vellum." It is ſcarcely poſſible to produce from any author ſo ſhort a paſſage, containing ſo much ignorance and miſrepreſentation. From the conſtruction of the latter part of it, one would ſuppoſe that we had Ware's authority, that William Halloran poſſeſſed an entire book of Ogums; whereas the real meaning is, that Ware poſſeſſed ſuch a book. Beſides, William Halloran was never called William of *Ogham;* and the epithet of Ocham, or Okeham, applied to this philoſopher, might have led Mr. O'Halloran to ſuſpect that this was the name of his birth-place, even had he been ignorant that he was actually born at Okeham in Surrey, and took his appellation, as was uſual, from that place. But the honour of his country, and his fondneſs for Iriſh etymology and antiquity, eſpecially when aided by an opportunity of celebrating a nameſake, and probably an anceſtor of his own, ſeems to have been too ſtrong for Mr. O'Halloran's love of hiſtoric accuracy.

Though colonel Vallancey confeſſes himſelf ignorant of the Iriſh derivation of the word *Ogum*, yet, in conformity to his known ſyſtem of Iriſh antiquities, he finds no difficulty in tracing it back to an oriental origin. It is derived, according to him, from the Chaldaic or Phœnician אחם, *Ocham:* and though there is much doubt among the rabbis reſpecting the meaning of this term; ſome explaining it to mean a cheſt to keep ſecret writing in; others, brazen veſſels; while others think it is the name of the town; colonel Vallancey poſitively avers, but without vouchſafing to give reaſon or authority for his aſſertion, that "the true and literal meaning of the word is a *court character*, appropriated to the records of the church and ſtate." Archæologia, vii. 284.

But though colonel Vallancey can bring forward only his own aſſertion for the oriental origin and meaning of the word *Ogum*, there can be little doubt that this, or a very ſimilar word, exiſts in the eaſtern language, with exactly the ſame meaning as it poſſeſſes in Iriſh. Mr. Weſton, in a paper in the 14th volume of the Archæologia, p. 246, quotes the authority of ſir William Jones, to prove that, in the Sanſcrit, the word *agam* means myſterious; and is derived from *gama*, to go, with the *a* prefixed, ſignifying to go to, to come at, or to acquire the knowledge of.

To apply the remarks which have been offered, reſpecting the etymology and meaning of the word *Ogum*, to the paſſage of Lucian, already referred to. Lucian, in his piece, entitled "De Hercule Gallico," edit. Paris, 1615, p. 853, deſcribes the Celtic Hercules; but from his account of him, it is evident that the Gauls viewed and worſhipped Hercules exactly in the ſame light as the Greeks and Romans did Mercury, *viz.* as the god of eloquence. This, indeed, he ſays, he was expreſsly informed by a Celt. But "the Celts," adds Lucian, "call Hercules by a word in their own vernacular tongue, *Ogmian*" (ογμιος). Schmidt, in a diſſertation in the firſt volume of the Archæologia, endeavours to prove that ογμιος had the ſame meaning in Celtic as in Greek, and is properly a furrow or boundary. For this he is rudely attacked by Toup, who conſiders ογμιος as a corruption for ομογνιος, and that the Hercules of Lucian is ομογενιος, or one of the dii penates.

As, however, Lucian expreſsly ſays that ογμιος was a Celtic word, we muſt look for its meaning in the dialects of that

that language; and as it was applied by the ancient Celts to their god of eloquence, the meaning, in all probability, has reference to the character of this deity. But the word *Ogum* is ſo ſimilar to it, both in ſound and meaning, that little doubt can be entertained that "*Hercules Ogmius* (to uſe the words of Keyſler) non alius ſit, quam *literatus*, *doctus*, *eloquens*." So far this part of Lucian's writing may be rationally and ſatisfactorily explained; but the opinion of Campbell and Toland, that, in the deſcription which Lucian gives of the Celtic Hercules, the nature and properties, as well as the name of the Iriſh alphabet, may be diſcovered, is too wild and ridiculous to claim a moment's inveſtigation or notice.

OGHAO, in *Geography*, a ſmall iſland in the South Pacific ocean, weſt of Annamooka.

OGIDOO, a town of Bengal; 24 miles S.W. of Ramgur.

OGIER, Charles, in *Biography*, a man of learning, was born at Paris in 1595. He ſtudied firſt at Bourges, afterwards at his native city, and then went to Valence to attend lectures in the law, of which faculty he was made a doctor. He followed for ſome time the profeſſion of an advocate; but becoming diſguſted with this employment, he accepted the poſt of ſecretary to Claude de Meſmes, count d'Avaux, in his embaſſy to the northern courts. Ogier accompanied him during his miſſion in the years 1634 and 1635, and drew up an account of his travels; when the count d'Avaux, finding himſelf complimented in it, deſired him to keep it in MS. for 20 years. It was firſt publiſhed in 1656, under the title of "Caroli Ogerii Ephemerides five Iter Danicum, Suecicum, Polonicum, cum eſſet in Comitatu illuſtro Claudii Memmii, Comitis Avauxii, ad ſeptentriones Reges extraordinarii Legati." This work contains many curious particulars of the manners and cuſtoms, the eminent characters, &c. of the countries viſited by the author, and likewiſe of the negociations of the count d'Avaux. It is interſperſed with Latin verſes. Ogier died in 1654. He had a brother Francis, an eccleſiaſtic, who attended the count d'Avaux, when he went to ſign the peace of 1648. He was author of poems, ſermons, and other works, of which one of the moſt eſteemed was his "Jugement et Cenſure de la Doctrine curieuſe de Fr. Garaſſe." He died in 1670. Moreri.

OGILBY, John, who had a conſiderable ſhare in introducing typographical ſplendour into this country, was born in the year 1600, at or in the vicinity of Edinburgh. His father, who was a branch of an ancient and conſiderable family, became a priſoner for debt in the king's bench, and was unable to give his ſon a liberal education: he, therefore, bound himſelf an apprentice to a dancing-maſter in London, and was afterwards employed in the family of the earl of Strafford, who appointed him deputy-maſter of the revels at Dublin, where Ogilby erected a theatre. To his honour it is mentioned, that with the firſt money which he earned, he freed his parent from priſon; an act of filial piety deſerving of the higheſt commendation. By a ſevere ſtrain in the muſcles of his leg, he was obliged to procure ſome other means for obtaining a livelihood. "It is not worth while," ſays his biographer, "to purſue the various fortunes of his life, through which he diſplayed extraordinary induſtry, a projecting head, with a talent of obtaining patronage in the execution of his projects, and a ſpirit not to be depreſſed by misfortunes and reverſes." He overcame his want of a literary education, ſo far as to be able to tranſlate from the Latin and the Greek: hence we have his verſions of Homer and Virgil. His Homer, though a very bad tranſlation, had the honour of being a great favourite with Pope in his childhood, and is thought to have kindled the poetical flame in his breaſt. The cuts to his tranſlation of Virgil were highly valued, and ſerved for a ſplendid edition of that poet. He publiſhed a magnificent edition of the bible with plates, for which he was remunerated by the houſe of lords. In 1661 he was appointed to conduct the ceremonies at the king's coronation, of which he publiſhed a pompous account in folio, with plates. He had the misfortune to loſe his whole property in the great fire of London; after which he obtained the appointment of his majeſty's coſmographer and geographic printer, in which capacity he printed ſome volumes of his great Atlas. He alſo publiſhed an account of Japan; and an account of the great croſs-roads of the kingdom, from his own actual ſurvey and menſuration by the wheel, which was for a conſiderable time a ſtandard work, and paſſed through many editions. He died in 1676.

OGIVES, or Og *Arches*, in *Architecture*, are arches or branches of a Gothic vault, which, in lieu of being circular, paſs diagonally from one angle to another, and form a croſs with the other arches which make the ſide of the ſquares, whereof the ogives are diagonals.

The middle, where the ogives cut or croſs each other, is called the *key*, which is ſometimes carved in form of a roſe, or a cul de lampe. The members or mouldings of the ogives are called nerves, branches, or reins; and the arches which ſeparate the ogives, double arches.

OGLETHORPE, James, in *Biography*, an Engliſh general, born in Weſtminſter about the year 1688, was the ſon of ſir Theophilus Oglethorpe of Godalmin in Surrey, who was accuſed of diſaffection in the reign of William and Mary. He entered the army as an enſign in 1710. He afterwards ſerved under prince Eugene, to whom he became ſecretary and aid-de-camp. On the reſtoration of peace, he returned home, and obtained a ſeat in the houſe of commons, where he was diſtinguiſhed by his exertions for the benefit of trade, and a reform in the priſons. In 1732 he went to America, ſettled in Georgia, and erected the town of Savannah. He again viſited that country, and made an unſucceſsful attempt upon Fort Auguſtine, the capital of Florida, belonging to the Spaniards. For this he was tried, on his return to England, and acquitted. In 1745 he was promoted to the rank of major-general, and was ſent againſt the rebels, but did not overtake them; on which account, the buſineſs was inveſtigated by a court-martial, but the general was honourably acquitted. He died in 1785, at the advanced age of 97, being by many years the oldeſt general in his majeſty's ſervice. Smollet's Continuation, vol. i. and ii. European Mag.

Oglethorpe, in *Geography*, a county of Georgia, in America, on the north ſide of Alatamaha river, weſt of Liberty county; containing 9780 inhabitants, of whom 3089 are ſlaves.

OGLIASTRO, a town of the iſland of Sicily, in the valley of Mazara; 9 miles S.S.E. of Palermo.

OGLIO, a river of Italy, which riſes in the biſhopric of Trent, and joins the Po at Bergo Forte.

Oglio. See Olio.

OGMO, in *Geography*, a town of Lower Siam, on the eaſt ſide of the gulf. N. lat. 13° 43′. E. long. 101° 48′.

OGMU, a town on the weſt coaſt of the iſland of Leyta. N. lat. 10° 55′. E. long. 124° 30′.

OGNATA, a town of Spain, in Guipuſcoa; 3 miles S.W. of Segura.

OGNI, a cluſter of five ſmall iſlands in the Grecian Archipelago, between the iſland of Scio and the coaſt of Natolia. N. lat. 38° 33′. E. long. 26° 14′.

OGOA, in *Mythology*, a deity worſhipped by the Carians, eſpecially in the city Mylaſſus. We learn from Pauſanias (In Arc.), that the ſea, which was thought to paſs under the temple of this god, ſometimes overflowed it. It is probable, therefore, that Ogoa was the name which the Mylaſſians gave to the god of the ſea.

OGOLETZ, in *Geography*, an iſland of Ruſſia, in the ſtraits of Vaigatſkoi. N. lat. 69° 40'. E. long. 26° 14'.

OGOR, a river of Ruſſia, which runs into the Duna, 12 miles S.E. of Riga.

OGOROO, one of the ſmaller Friendly iſlands; 15 miles N. of Annamooka.

OGOST, a river of European Turkey, which runs into the Danube near Rakova, in Bulgaria.

OGOUA. See Oegwa.

OGRAM Lough, a lake of the county of Clare, Ireland, the river flowing from which paſſes through Scarriff to the Shannon. By Dutton and Pelham it is called Lough O'Grady. It is in the north-eaſtern mountainous diſtrict of the county. Beaufort.

OGRAN, a town of Hungary; 15 miles N.N.W. of Preſburg.

OGRESSES, or Agresses, in *Heraldry*. See Pellets.

OGULIN, in *Geography*, a town of Croatia; 32 miles E. of Fiume.

OGYGES, in the *Hiſtory of the Heroic or Fabulous Age* of Greece, a ſovereign of Attica and Bœotia, under whoſe reign happened the inundation ſince known by the name of Ogyges's deluge. Whether this prince was a native or a foreigner; at what time he lived; and what was the deluge which happened under his reign, are queſtions of no very eaſy ſolution. The Greek hiſtorians tell us, that Ogyges reigned, as we have ſaid, in Attica and Bœotia, while Phoroneus, the ſon of Inachus, governed Argolis, and that it was in his time the deluge happened which has paſſed under his name, and the date of which Cenſorinus fixes about the year 1200 before the Trojan war: but in proof of theſe facts they cite no authorities. The Parian Marbles ſay nothing of it, and that famous chronicle begins only with the arrival of Cecrops in Greece. According to Auguſtine (De Civ. Dei), the deluge of Ogyges happened under Phoroneus, the ſecond king of Argos; and he alleges, that this was the opinion of Euſebius and Jerome. Sir Iſaac Newton, who has very much contracted the antiquities of Greece, places the date of this deluge in the year 1045 before our vulgar era. Julius Africanus, on authorities which he has cited, and among others that of Diodorus Siculus, maintains, that Ogyges lived more than 1020 years before the firſt Olympiad, and conſequently nearly 1800 years B.C.; and this date agrees with the opinion of Petavius, who fixes the deluge under that prince's reign to the year 1796 before our vulgar era. St. Jerome contends, that it was not at Attica, as all the ancients allege, but in Egypt that the deluge of Ogyges happened; but as Jerome ſuppoſes that prince to have been contemporary with Moſes, we may conjecture that this contended deluge was nothing elſe but the event that happened in the Red ſea at the exodus of the Hebrews. Banier thinks it certain, that Ogyges was not a native of Greece; but does not determine whether he was from Egypt or Phœnicia, or from the country of Amalek. He went and ſettled at Thebes in Bœotia, named frequently by the ancients Ogygian Thebes; and he reigned alſo over Attica. It was under his reign the inundation happened, which occaſioned great deſolation in the country, and went by the name of the deluge. The epocha of the deluge is placed by Banier towards the year 1796 B.C., agreeably to the Greek hiſtory, and to the opinion of Petavius and Marſham. In Blair's Table, the reign of Ogyges in Attica is fixed in the year 1796 B.C., and his death in 1764 B.C., when the deluge happened; which deluge is ſaid to have laid waſte the country of Attica for 200 years, till the coming of Cecrops.

OGYGIÆ Insulæ, or *Ogygian Iſles*, in *Ancient Geography*, comprehend a certain number of iſlands near that part of Italy called Brutium, to the eaſt, and oppoſite to a kind of peninſula, north-eaſt of the Scylacian gulf. They are repreſented as the territory of the nymph Calypſo, and one of them bears her name, as well as that of Ogygia. It is particularly deſcribed by Pliny.

OHAMANENO, in *Geography*, a ſmall but good harbour, on the weſt ſide of Ulietea, one of the Society iſlands. The channel leading into it is about a quarter of a mile wide, lying between two low ſandy iſlands, within which is good anchorage in 28 fathoms, and ſoft ground. S. lat. 16° 45'. W. long. 151° 38'.

OHAMENE Harbour, a fine bay on the eaſt ſide of Otaha, one of the Society iſlands; which paſſes in between two ſmall iſlands, Tochoutu and Whannuaia, forming a good harbour, with 25 to 26 fathoms water.

OHANG JAVA, a group of nine iſlands in the Pacific ocean, diſcovered by Taſman, and lying in S. lat. 4° 36'. E. long. 154° 17'. One of theſe iſlands is of conſiderable extent, the other eight are ſcarcely better than large rocks; but though they are low and flat, they are well covered with wood, and abound with inhabitants. The people are black, and woolly-headed, like the Negroes of Africa. Their weapons are bows and arrows; and they have large canoes, which they navigate with a ſail.

OHATOOA, one of the Navigator's iſlands, probably the ſame with that called by La Perouſe *Ozolova;* which ſee.

OHERURUA, a harbour on the weſt coaſt of the iſland of Otaha. S. lat. 16° 38'. W. long. 151° 30'.

OHETEROA, an iſland in the South Pacific ocean, 13 miles in circuit, and rather high than low, but neither populous nor fertile in proportion to the other iſlands in theſe ſeas. The chief produce ſeemed to be the tree of which they make their weapons, called in their language "Etoa." It was encompaſſed by Cook and his companions, Auguſt 1769; but it had neither harbour nor anchorage about it. The natives, who were fierce and hoſtile, ſeemed to be luſty and well made: under their arm-pits they had black marks about as broad as the hand; they had alſo circles of the ſame colour, but leſs broad, round their arms and legs, but no other part of the body was marked. The cloth that formed their dreſs reſembled that of the other iſlands in its materials, of a bright but deep yellow, covered with a compoſition like varniſh, which was either red or of a dark lead colour: over this were painted ſtripes of many different patterns, regularly diſpoſed. Their habit was a ſhort jacket of this cloth, reaching about as low as their knees, conſiſting of one piece, and ſtitched round with long ſtitches. It was girt round them in ſuch a manner, that they exhibited a gay and warlike appearance. Some had caps of the feathers of the tropic-bird, and ſome had cloth turbans. Their arms were long lances, made of the hard wood of the tree called Etoa, well poliſhed and ſharpened at one end, ſome of which were 20 feet long, and three fingers thick. They had alſo a weapon, which was both a club and pike, and made of the ſame wood, about ſeven feet long, and poliſhed and ſharpened at one end with a broad point. As a guard, when they attacked each other, they had ſeveral folds of mats, placed under their clothes from the

the neck to the waiſt. Other things which were ſeen in this iſland were ſuperior to any which our navigators had ſeen before: the cloth was better dyed, and painted with greater neatneſs and taſte; the clubs were better cut and poliſhed; and the canoe, though ſmall, was very richly ornamented and well carved. Their hoſtile diſpoſition prevented any intercourſe. Hawkeſworth's Voyages, vol. ii. p. 273. &c.

OHETUNA, a harbour on the ſouth-eaſt coaſt of Ulietea.

OHEVAHOU, an iſland in the South Pacific ocean. S. lat. 9° 42′. W. long. 139° 2′.

OHHUD, a mountain of Arabia, in the province of Hedsjas, where Mahomet was defended by the Koreiſh; 8 miles N. of Medina.

OHIO, one of the United States of America, admitted into the union by act of congreſs, April 28th 1802, and organized March 3d 1803. Its length and breadth are 200 miles each; and it lies between 38° 10′ and 40° N. lat., and 80° 30′ and 85° 45′ W. long. Excluſively of the waters of lake Erie and Sanduſky, it contains 39,128 ſquare miles nearly, or 25,043,637 acres; of which 17,409,717 acres have been purchaſed of the Indians. Of theſe lands, to which the Indian title is extinguiſhed, 580,159 acres have been appropriated for the endowment and ſupport of an univerſity, an academy, and ſchools, and for the ſupport of religion; 8,418,068 acres are private property; and the remaining 8,411,490 acres are reſerved for the future diſpoſal of congreſs. This ſtate lies weſt of Pennſylvania, and is bounded ſouth by the Ohio river; weſt by the Indiana territory, being ſeparated from it by a line drawn from the mouth of the Great Miami river due north, nearly to the parallel of 42° N. lat.; north by Michigan territory and lake Erie, from the former of which it is divided by an eaſt and weſt line drawn through the ſoutherly extremity of lake Michigan, and interſecting the territorial line in lake Erie; eaſt by Pennſylvania. In 1804, this ſtate was divided into 18 counties, as in the following table:

| Counties. | When conſtituted. | No. white Males of 21 Years and upwards, according to the Cenſus of 1803. | Chief Towns. |
|---|---|---|---|
| Trumbull | 1799 | 1111 | Warren |
| Columbiana | 1803 | 542 | |
| Jefferſon | | 1533 | Steubenville |
| Bellmont | 1803 | 1030 | Pultney |
| Waſhington | 1788 | 1246 | Marietta |
| Gallia | 1803 | 307 | Galliopolis |
| Scioto | 1803 | 249 | Alexandria |
| Adams | | 906 | Maſſieſburgh |
| Clermont | | 755 | Williamſburgh |
| Hamilton | 1799 | 1700 | Cincinnati |
| Muſkingum | 1803 | † | |
| Fairfield | | 1051 | New-Lancaſter |
| Roſs | | 1982 | Chilicothe |
| Franklin | | 240 | Franklington |
| Warren | | 854 | |
| Greene | | 446 | |
| Butler | | 836 | |
| Montgomery | | 526 | |
| | | 15,314 | |

† Included in Waſhington county.

The whole number of inhabitants in Ohio in 1803, was eſtimated at about 76,000, excluſively of ſeveral hundreds of people of colour, and the conſtant influx of emigrants amounting yearly to about 12,000.

For judicial purpoſes, the ſtate of Ohio is divided into three circuits, *viz.* 1. Butler, Clermont, Greene, Hamilton, Montgomery, and Warren. 2. Adams, Fairfield, Franklin, Gallia, Roſs, and Scioto. 3. Bellmont, Columbiana, Jefferſon, Trumbull, and Waſhington.

The chief towns of this ſtate are Marietta, Chillikothe, Cincinnati, Galliopolis, Xenia, &c. which ſee reſpectively. The principal rivers are the Ohio, Muſkingum, Hockhocking, Scioto, Miami, &c. Although a great part of this country is uneven, it cannot be called mountainous nor even hilly. However, in the upper and northern parts of the ſtate it may deſerve the latter appellation, and it is too rough to admit of much cultivation; and in other parts the inundation and ſettlement of the waters render it waſte land. No part of the federal territory unites, as it is ſaid, more advantages, with regard to health, fertility, variety of productions, and foreign intercourſe, than that tract which ſtretches from the Muſkingum to the Scioto and the Great Miami rivers. The country on the Ohio is every where pleaſant, with large level ſpots of rich land, and remarkably healthy. The bottom and ſides of the river are ſtony from Pittſburg down to the low country, a diſtance of about 800 miles. The ſtrata of ſtone are horizontally diſpoſed, and conſiſts principally of either free-ſtone or lime-ſtone. Although the flat lands on the Ohio are not ſurpaſſed by any in the United States for fertility, they are in many places ſmall and inconſiderable, being encircled by hills and mountains on one ſide and the river on the other. The lands on the various ſtreams that fall into the Ohio are interſperſed with all the variety of ſoil which conduces to pleaſantneſs of ſituation, and lays the foundation for the wealth of agricultural and manufacturing people. Large level bottoms, or natural meadows, (*priaries*) from 20 to 50 miles in circuit, are every where found bordering the rivers and variegating the country in the interior parts. Theſe afford a peculiarly rich ſoil, and may be cultivated with little labour. In many of theſe bottoms a man may clear an acre a day, fit for planting with Indian corn; as here is no underwood, and the trees, which grow high and large, are not thickly ſet. This country produces all the neceſſaries of life in great abundance, and far beyond the conſumption of the inhabitants; the reſidue, with many other articles, ſuch as hemp, cordage, hard-ware, glaſs, whiſkey, apples, cider, and ſalted proviſions, are carried down the river to New Orleans, where they find a ready market. Iron, lead, and copper are found in ſeveral places: beſides native ſulphur, nitre, and alſo vitriol and alum. Every part of the ſtate ſupplies pit-coal (lithanthrax); and the mines of it are not only abundant, but inexhauſtible, from Pittſburgh many miles down the river. Boles and pigments are found on the banks of the rivers: clay ſuitable for pottery and bricks is abundant. On the banks of the Ohio are fine marcaſites, ſometimes called thunder-ſtones; theſe are black, leſs ponderous than coal, and yet capable of giving fire when ſtruck againſt ſteel. Their compoſition is irregularly foliaceous; in the fire they yield a blue ſulphurous flame, and calcine into a purple powder. The natives uſe them in curing or rather bleaching leather. The prevailing growth of timber and the more uſeful trees are maple and ſugar-tree, ſycamore, black and white mulbery, ſome of which are of a very large ſize, black and white walnut, cheſnut, various ſorts of oak, hickory, cherry, buck-wood, or horſe cheſnut, honey-locuſt, elm, cucumber-tree, lynn-tree, gum-tree, iron wood, aſh,

aſh, aſpin, ſaſſafras, crab-apple tree, papaw or cuſtard apple, a variety of plum trees, nine bark-ſpice, and leather wood buſhes. Both the high and low lands produce great quantities of various kinds of grapes, from which the ſettlers ſupply their own conſumption with rich red wine. Hops grow ſpontaneouſly. The ſugar maple is the moſt valuable tree for an inland country. One tree will yield on an average about four pounds of ſugar a year, and the labour is trifling. The ſap is extracted in the months of February and March, and granulated, by the ſimple operation of boiling, to a ſugar equal in flavour and whiteneſs to the beſt Muſcovado. Springs of excellent water abound in every part of the territory; and ſmall as well as large ſtreams for mills and other purpoſes are interſperſed; but as there is little fall in the ſtreams, they fail in dry ſeaſons, and good mill-ſeats are ſcarce. The ſwamps may be eaſily drained and converted into arable and meadow land; and the hills, though frequent, are gentle and ſwelling; the ſoil is deep and rich, covered with a heavy growth of timber, no where incapable of tillage, and well adapted to the production of wheat, rye, indigo, tobacco, &c. In this ſtate, the orchard and garden fruit-trees thrive ſurpriſingly; the peach trees bear abundantly, and the fruit is ſuperior in ſize, beauty, and flavour to any that is raiſed in the northern ſtates. The productions of the fields, in general, are wheat, oats, barley, rye, Indian corn, hemp, flax, and cotton. The gardens yield all the culinary plants in perfection. Melons grow to a large ſize, and ripen into deliciouſneſs. Over the ſurface of the ground and in the extended foreſts grows a natural herbage, in great abundance, on which cattle are found to thrive remarkably well. This country alſo affords ample gratification to the curious botaniſt in his reſearches for new, rare, and curious plants. The climate in this ſtate is exceedingly mild and agreeable. The winter commences at the ſolſtice and laſts about two months. The ſnow does not lie upon the ground for more than three days. It ſeldom freezes for more than five or ſix days ſucceſſively, at which time the ſurface of the ſtagnant waters and of the ſmaller ſtreams is congealed. The winds in winter are very variable; and the ſevereſt cold attends the N.W. wind. In January are many fine days, a pure ſerene air, and clear ſun-ſhine, with ſoutherly and ſouth-weſterly winds. The ſpring is attended with rains and cloudy weather, with ſouth and ſoutherly winds. In the latter end of April the ſeaſon is in its flowery prime. During the ſummer the heats increaſe, tempered at night by refreſhing breezes up the river. There are frequent ſhowers with thunder. The autumn is diſtinguiſhed by ſerene and fine weather: but at the autumnal equinox the rains begin, with cold winds from the N.E. round to the N.W. The ſalubrity of the climate is equal to that of any part of the United States; though on ſome of the low and wet grounds fever and ague are prevalent. The diſtance of 100 miles N. or S. makes a great difference in the temperature of the air. Near the river Sanduſky the cold is much more ſevere, with a greater quantity of ſnow, than on the Muſkingum; and on the Scioto ſnow hardly ever remains on the ground. The weather alſo varies conſiderably on the E. and W. ſide of the Alleghany mountains. All ſtorms of thunder and lightning riſe either with S.W. or N.W. winds; but in Pennſylvania the N.W. wind brings fine and clear weather.

The exports from this country conſiſt of flour, corn, hemp, flax, cotton, beef, pork, ſmoked hams, veniſon, whiſkey, peach-brandy, oak-ſtaves, lumber, &c. raw and tanned hides, and peltry. Ship building has lately commenced and is likely to increaſe with advantage to the country.

No country was originally better ſtocked with wild game of every kind than this. Innumerable herds of deer and wild cattle were ſheltered in the groves, and fed in the extenſive low grounds that abound here. Turkies, geeſe, ducks, ſwans, teal, pheaſants, partridges, &c. were within a few years paſt very plentiful; but on the approach of ſettlers, buffaloes diſappear. Geeſe and ſwans are now ſeldom killed; ducks are not plentiful. Bears, deer, and turkies, are now the principal game. At the falls of the Ohio, geeſe and ſwans are found in great plenty. The rivers abound with various kinds of fiſh, which are generally large and of excellent quality.

Among the curious antiquities of this country we may mention its forts, which are moſtly of an oblong form, ſituated on well choſen ground, and contiguous to water. They are very ancient, and it is ſuppoſed that they were conſtructed 1000 years ago, but for what purpoſe and by whom, are queſtions of ſpeculation and reſearch. At a convenient diſtance from theſe are tumuli or mounds of earth, ſomewhat reſembling the barrows of other countries (ſee BARROW); and which have been found to contain a chalky ſubſtance, ſuppoſed to be bones and of the human kind. Other works have been diſcovered 90 miles from Marietta, on one of the weſtern branches of the Muſkingum, extending near two miles, the ramparts of which are now in ſome places more than 18 feet in perpendicular height. Theſe elevated mounds, ſquares, and forts, reſemble thoſe of Mexico, and it has been ſuggeſted that they have the ſame original; and they have been aſcribed to a people, the moſt ancient of which there is any account in that part of the world, called by Clavigero, in his "Hiſtory of Mexico," Toltecas. He deſcribes theſe people as celebrated for their ſuperior civilization and ſkill in aſtronomy and the arts. Theſe people are ſaid to have been baniſhed from their native country, and to have commenced an emigration about the middle of the ſixth century. In the courſe of their emigration they ſtaid for different intervals of time in various ſtages of their journey; in ſome places erecting houſes and directing their attention to the concerns of agriculture. The fact of ſuch an emigration from a northern region of theſe brave and warlike people, at an early period, though it is not poſſible accurately to aſcertain the dates of every event, cannot be doubted: and that they erected the fortifications and mounds that are here mentioned, as they advanced in their progreſs, ſeems not improbable. It merits conſideration alſo, that the ſituation, conſtruction, form, and general contents of the Aſiatic tumuli and the ancient American mounds are ſo ſimilar, that they may be aſcribed to the ſame people. Many other reaſons may be ſuggeſted to juſtify the opinion that the aborigines of America were deſcendants of the ancient Scythians, and paſſed into that continent from the eaſtern parts of Aſia; ſuch is the practice of ſcalping their priſoners, the fabric and ſtructure of birch canoes, the method of marching in what is called "Indian file," and the conſtruction of implements of war and inſtruments of the chaſe. Many other circumſtances might be mentioned, in which there is a reſemblance between the ancient Americans and the Tartar tribes of Aſia.

Other curioſities of this country, are the caves of artificial conſtruction found on the bank of the Ohio: in one of which, called by the Indians "the habitation of the great ſpirit," are found inſcriptions, names of perſons, dates, &c. Among the natural curioſities of this country we might alſo mention the "Prairiés," which are immenſe plains of different ſorts, occaſioned either by the exſiccation of lakes or vaſt moraſſes, or by the abſorption of the rains that fall upon them, and which reſemble the vaſt "Steppes" in the upper

parts of Ruſſia and Siberia. There are alſo found open cleared ſpots on the ſummits of hills, called "Buffaloe beats," becauſe they are ſuppoſed to have been occaſioned by the reſort of theſe animals thither in fly time. The "ſalt licks" are alſo among the natural curioſities of this country.

For a more particular account of theſe remains of antiquity we refer to Harris, ubi infra. At Athens, in the diſtrict of Middletown, is the "Ohio Univerſity," eſtabliſhed by an act paſſed on the 12th of December, 1801. This inſtitution, though recently eſtabliſhed, is endowed with 46,000 acres of land, within which the town of Athens, on the Hockhocking river, 40 miles by water from the Ohio, is pleaſantly ſituated. Of this land, 1500 acres were cleared in 1804, leaſed, and inhabited by 100 families. The corporation conſiſts of the governor of the ſtate for the time being, the preſident, and not more than 15, nor leſs than 10 truſtees.

The legiſlative authority of this ſtate is veſted in a general aſſembly, compoſed of a ſenate to be choſen biennially, and a houſe of repreſentatives to be choſen annually, both by the people: the repreſentatives to be proportioned by law from time to time to the population. The ſenators are divided into two claſſes, by lot; the ſeats of the firſt claſs to be vacated at the expiration of one year; of the ſecond at the expiration of the ſecond year; ſo that one-half is to be annually choſen. The houſe of repreſentatives have the power of impeachments, which are to be tried by the ſenate. The ſupreme executive power is veſted in a governor to be choſen biennially, by the people: he is eligible only ſix years in any term of eight years. The judiciary power is veſted in a ſupreme court, in courts of common pleas in each county, and juſtices of the peace. The judges of the ſupreme and county courts are to be appointed by a joint ballot of the two houſes of aſſembly, to hold their offices for ſeven years. In all elections, all white males, above the age of 21 years, having reſided in the ſtate one year next preceding the election, and who have paid or are charged with a ſtate or county tax, ſhall enjoy the right of an elector, in the diſtrict where he actually reſides at the time of the election.

The ſettlement of this county was checked and retarded for ſeveral years by the Indian war, which terminated on the 3d of Auguſt 1795, when a treaty was formed at Greenville between major-general Anthony Wayne on the part of the United States, and the chiefs of the following tribes of Indians, *viz.* the Wyandots, Delawares, Chawanou, Ottawas, Chippewas, Putawatimes, Miamis, Eelriver, Weeas, Kickapoos, Pian-Kaſhaws, and Kaſkaſkias. By this treaty the Indians ceded a conſiderable territory to the United States, and the latter relinquiſhed their claims to lands that are particularly deſcribed. Preſents were made to the Indians of goods to the amount of 20,000 dollars; and the treaty ſtipulated the grant of goods every year thenceforward, to the amount of 9500 dollars, at firſt coſt in the United States, to be delivered to the Indians at ſome convenient place northward of the Ohio. Since this treaty, a trade has been opened by a law of congreſs with the forementioned tribes of Indians, on a liberal footing, which promiſes to give permanence to the treaty and ſecurity to the future inhabitants. Morſe's Geography. Harris's Journal of a Tour, &c Boſton, 1805.

Ohio, the principal river in the ſtate above-deſcribed, ſeparating this ſtate and Indiana territory from Kentucky and Virginia on the S.E. and formed by the confluence of the Alleghany and Monongahela below Pittſburg. Both the names, Alleghany and Ohio, have the ſame meaning in different Indian languages; the former in the Delaware, and the latter in the Seneca, ſignifies the "fine, or fair river;" and the whole ſtream, from its head to its junction with the Miſſiſippi, was ſo denominated by theſe reſpective nations. Hence it was firſt named by the French, "La Belle Riviere." From Pittſburg it takes a N.W. courſe for about 25 miles, then turns gradually to the W.S.W., and purſuing that courſe for about 500 miles, winds to the S.W. for nearly 160 miles, and at length empties itſelf into the Miſſiſippi in a S.E. direction, about 1100 miles below Pittſburg, and nearly at the ſame diſtance above New Orleans, in N. lat. 36° 43′, or 37° 0′ 20″. It is very crooked in its courſe, but its general direction is S. 60° W. At fort Pitt, it is a quarter of a mile wide; 500 yards at the mouth of the Great Kanhaway; 1200 yards at Louiſville; and at the rapids, half a mile, in ſome few places below Louiſville, but its general breadth does not exceed 600 yards. In ſome places its width is not 400, and in one place particularly, far below the rapids, it is leſs than 300. Its breadth in no place exceeds 1200 yards, and at its junction with the Miſſiſippi, neither river is more than 900 yards wide. Its length, as meaſured according to its meanders by Capt. Hutchins, is as follows: From Fort Pitt

| | Miles. |
|---|---|
| To Log's Town | 18½ |
| Big Beaver Creek | 10¾ |
| Little ditto | 13½ |
| Yellow Creek | 11¾ |
| Two Creeks | 21¾ |
| Long Reach | 53¾ |
| End Long Reach | 16½ |
| Muſkingum | 26½ |
| Little Kanhaway | 12¼ |
| Hockhocking | 16 |
| Great Kanhaway | 82½ |
| Guyandot | 43¾ |
| Sandy Creek | 14½ |
| Scioto | 48¾ |
| Little Miami | 126¼ |
| Licking Creek | 8 |
| Great Miami | 26¾ |
| Big Bones | 32½ |
| Kentucky | 44¼ |
| Rapids | 77¼ |
| Low Country | 155¾ |
| Buffalo River | 64½ |
| Wabaſh | 97¼ |
| Big Cave | 42¾ |
| Shavanee River | 52¼ |
| Cherokee river | 13 |
| Maſſack | 11 |
| Miſſiſippi | 46 |
| | 1188 |

In common winter and ſpring floods, the Ohio affords 30 or 40 feet of water from the Miſſiſippi to Louiſville; 25 or 30 feet to La Torte's rapids; 40 above the mouth of the Great Kanhaway; and a ſufficiency at all times for flat-bottomed boats and canoes, to Fort Pitt. The inundations of this river begin about the latter end of March, and ſubſide in July, although they frequently happen in other months. Beſides the waters of many creeks, the Ohio receives in its courſe ſeveral rivers; *viz.* the Great and Little Kanhaway, or Kenhawa, the Great and Little Guyandot, the Great and Little Sandy, Licking, Salt, Cumberland, and Tenneſſee from the E. and S.; and the Muſkingum, the Hockhocking,

Hockhocking, the Great and Little Scioto, the Great and Little Miami, and the Wabaſh, from the N.

The *rapids* in the Ohio are ſituated in N. lat. 38° 8′, according to Hutchins's Survey; 705 miles below Pittſburg. They are occaſioned by a ledge of rocks, which extends acroſs the bed of the river. When the water is low, the greater part of the rocks becomes viſible, and the navigation is difficult; though there is a channel through which flat-bottomed boats can paſs in ſafety, conducted by a ſkilful pilot: but in the time of the freſhets, the rapids are hardly to be perceived by the navigator, except from the ſuperior velocity of the veſſel's movement; and then a 74 gun-ſhip might deſcend with the greateſt eaſe. The ſituation of the rapids is very delightful; and the town of Louiſville commands a grand view of them. In levelling their deſcent, it has been found to be 22½ feet in two miles, except at the rapids. The current of this river is gentle, its waters clear, and its boſom ſmooth and unbroken.

The numerous iſlands interſperſed in this river add much to the beauty of its appearance; but they embarraſs the navigation, particularly in low water, as they occaſion ſhoals and ſand bars. The extent of ſome of theſe iſlands is conſiderable; their ſoil is rich, and they are covered with a fine growth of trees. Morſe and Harris.

Ohio, the north-weſternmoſt county of the ſtate of Virginia, bounded E. by Waſhington county in Pennſylvania, and N.W. by the river Ohio, which ſeparates it from the ſtate of Ohio. It contains 4483 free inhabitants, and 257 ſlaves. Its chief town is Weſt Liberty.—Alſo, a county of Kentucky, containing 1121 inhabitants, of whom 122 are ſlaves.

OHIOPE, a ſmall northern tributary ſtream of Alatamaha river, in Oglethorpe county, Georgia, in America.

OHIOPIOMINGO, a tract of land in the ſtate of Kentucky, ſituated in Nelſon county, on the river Ohio, S.W. of Salt river.

OHIOPYLE Falls, a cataract of America, in Youghiogany river, about 20 feet in perpendicular height, and 80 yards wide, at the diſtance of 30 or 40 miles from the mouth of this river, where it mingles its waters with thoſe of the Monongahela.

OHITABOO, an iſland in the South Pacific ocean. S. lat. 9° 55′. W. long. 139° 6′.

OHLAU, a town of Sileſia, in the principality of Brieg, on the river Ohla, which riſes four miles S. of Munſterberg, and runs into the Oder at Breſlau. The town is ſituated in the midſt of marſhes, and ſurrounded with walls and ramparts. It has a large caſtle, a copper flatting mill, and two churches, one for Roman Catholics and another for Proteſtants. It has alſo a Poliſh church. Its vicinity yields great quantities of tobacco, 8 miles N.W. of Brieg.

OHLM, or Ulm, a town of Germany, in the circle of the Lower Rhine, and electorate of Mentz, on the Selz; 6 miles S.W. of Mentz.

OHM, a river of Germany, in the circle of the Lower Rhine, which runs into the Lahn, near Marpurg.

OHOULANG, a town of Thibet; 107 miles S. of Haratoube.

OHRA, a river of Germany, in the circle of Lower Saxony, which runs into the Unſtrutt, 6 miles N. of Erfurt.

OHRDRUF, a town of Germany, in the circle of Upper Saxony, and principality of Gotha, capital of the county of Glaichen. After having often ſuffered by fire, it is now in a flouriſhing ſtate by its numerous manufactures; 8 miles S.S.E. of Gotha.

OHRENBAU, or Ohrnbau, a town of Germany, in the circle of Franconia, and biſhopric of Aichſtatt; 6 miles S.S.E. of Anſpach.

OHRINGEN, or Oringawe, a town of Germany, in the circle of Franconia, and principality of Hohenlohe, on the Ohrn, which runs into the Cocher: this river divides it into the Old and New Town; it contains two churches and an hoſpital; 34 miles E.S.E. of Heidelberg.

OHRLE, a town of Germany, in the circle of Lower Saxony, and duchy of Bremen; 3 miles S.W. of Bremervord.

OHTAKARI Islands, a cluſter of ſmall iſlands on the E. ſide of the gulf of Bothnia. N. lat. 64° 6′. E. long. 23° 26′.

OI, a river of Ruſſia, which runs into the Yeniſei, N. lat. 55° 16′. E. long. 91° 34′.

OIA, a river of Ruſſia, which runs into the Obſkaia gulf, N. lat. 68°. E. long. 72° 24′.

OJA, a town of Sweden, in the province of Sconen; 21 miles S.S.E. of Lund.—Alſo, a town of Sweden, in the province of Smaland; 9 miles S.W. of Wexio.

OIBO, or Maoibo, one of the Querimba iſlands, in the Indian ſea, near the coaſt of Africa. S. lat. 12° 12′.

OICH-Loch, a conſiderable lake in the county of Inverneſs, Scotland, is ſituated in the great vale of that diſtrict, and conſtitutes part of the ſeries of lakes and rivers which extend acroſs the whole iſland, from the Moray Frith to the Sound of Mull. It is about four miles in length, and contains ſeveral beautiful little iſlands covered with trees. The banks of this lake riſe very gradually, and form a ſeries of ſmall bays on each ſide. From its eaſtern extremity iſſues the river Oich, which, after a courſe of five miles, diſcharges itſelf into loch Neſs, at the diſtance of 400 yards from the mouth of the river Tarff. The peninſula between theſe ſtreams is diſtinguiſhed as the ſcite of Fort Auguſtus. This is a regular fortreſs, defended by four baſtions, and has barracks capable of accommodating a garriſon of four hundred men. It is not, however, conſidered a place of any ſtrength, being commanded by the ſurrounding hills. The rebels ſtormed this fort in 1746, but not deeming it of importance to the ſucceſs of their cauſe, ſoon again abandoned it, after deſtroying the greater part of the fortifications.

OICHIL, a mountain of Scotland; 12 miles S.W. of Perth.

OJECK, a town of Poland, in the palatinate of Sandomirz; 12 miles S.S.W. of Sandomirz.

OJEON, a town of Japan, in the iſland of Ximo; 25 miles S.W. of Awa.—Alſo, a town of Spain, in the province of Granada; 3 miles N. of Marbella.

OJEREN, a lake of Norway, in the province of Aggerhuus; 24 miles long and two wide; 10 miles E. of Chriſtiania.

OJESTADS, a town of Norway; 24 miles N.N.E. of Chriſtianſand.

OIGNY, a town of France, in the department of the Cote d'Or; 12 miles S. of Chatillon ſur Seine.

OJIO, a town of New Navarre; 24 miles E. of Caſa Grande.

OIL, in *Chemiſtry* and the *Arts*. Oils are divided into two claſſes: A. *Volatile*, and B. *Fixed oils*. The latter into two orders; *a*, fat, and *b*, drying oils.

A. *Volatile or Eſſential Oils*.—Theſe are ſo called becauſe they are evaporable at a moderate heat without decompoſition, and becauſe in them the odour or fragrance, or as the old chemiſts called it, the *eſſence* of vegetables conſiſts. Oils of this kind are obtained generally from vegetables, and ſome varieties from animals. They are extracted from the roots,

leaves, flowers, ſeeds, and fruits of vegetables, but ſeldom from ſeeds with two cotyledons, which generally afford the fixed oils; while the huſk, or cover of the ſeed, is always more or leſs impregnated with volatile oil, the acrimony of which defends in ſome degree the rudiments of the young plant from the depredations of inſects. The volatile oils, which are procured from the fruits of the lemon, the orange, and the bergamotte orange, are thoſe which alone are capable of being obtained by expreſſion. For this purpoſe a ſmall wheel, with its circumference ſet with ſtout nails, is put in motion, and a lemon or orange is applied to it till the whole of the yellow outer rind is raſped away. The raſpings fall to the bottom of the caſe in which the wheel turns, and they are then ſqueezed between two plates of glaſs. By this gentle preſſure the eſſential oil flows from the ruptured cells into any adjoining veſſel, and is there ſuffered to reſt till the water and other impurities have ſubſided. In a way ſimilar to this is obtained in India the precious perfume called the oil or "otter" of roſes. For this purpoſe a clean caſk or glazed earthen jar is filled with roſe-leaves ſeparated from its calyces, which are covered with ſpring-water. The veſſel is then ſet in the ſun for two or three days, and brought under cover in the night. At the end of the third or fourth day ſmall particles of yellow oil will float on the ſurface of the water, which in a week will have accumulated into a thin ſcum: this ſcum is taken up by a little cotton tied to the end of a ſtick, and ſqueezed into a ſmall phial.

Eſſential oils are generally obtained by diſtillation. The freſh herbaceous plant, or the dried plant, previouſly macerated for a few hours in water, or the bark or wood raſped or cut into ſhavings, and macerated for ſeveral days, are cloſely rammed down in a tinned copper ſtill or alembic; and when covered with water, the head of the ſtill is luted on and the refrigeratory filled with cold water, and then the fire is lighted and ſo regulated as to keep the contents of the ſtill conſtantly ſimmering, without boiling. The ſteam condenſed in the worm will form a ſmall ſtream of water, which is to be collected in proper veſſels, till it comes off nearly inſipid and inodorous; and then the diſtillation is ſtopped. The firſt part of the produce, as it is turbid from ſuperſaturation with eſſential oil, is kept for ſome hours in a cold place, during which time the exceſs of oil will ſeparate from the water, and either float on the ſurface or ſink to the bottom, according to its ſpecific gravity. The oil is completely ſeparated from the diſtilled water by an inſtrument called the Italian recipient; and the whole of the water produced by the firſt diſtillation is employed in the next, inſtead of plain water; ſo that thus the produce of oil in the ſecond diſtillation will exceed that of the firſt, by the whole quantity held in permanent ſolution by the water of the former proceſs. By this proceſs, the amount of oil yielded by equal quantities of the ſame ſubſtance will form a conſtantly increaſing ſeries, till the whole of the water drawn off by each diſtillation is completely ſaturated with oil. It is not till the ſeventh, or even ſometimes the tenth diſtillation, that the produce of oil attains its maximum. Eſſential oil may be procured not only from odorous vegetables themſelves, but from ſuch of the immediate products of vegetation as poſſeſs any odour; ſuch are the balſams and many of the reſins and gum reſins. The peculiar odour of vegetables, when not in a ſtate of decompoſition, depending on the volatile oil they contain, it is plain that the odours of the oil themſelves are equally various. Their taſte is exceedingly hot and pungent, and in ſome, particularly the oil of peppermint, followed by a remarkable ſenſation of coldneſs, though the thermometrical temperature undergoes no change. The acrimony of ſome of the oils, as the oil of cloves, is ſo great as actually to deſtroy the outer ſkin of the tongue and of other ſenſible parts. The colours of eſſential oils are various, ſome being blue, others green; but the uſual colour is light yellow, verging more or leſs by long keeping to reddiſh-brown. Other ſtriking characters of volatile oils are that they are liquid, more or leſs at different temperatures, ſometimes thick and glutinous like the expreſſed oils, and ſometimes ſolid and in cryſtals. In the latter ſtate they approach the nature of reſins. They are highly combuſtible, producing much ſmoke, condenſing into ſoot. They are alſo of an agreeable ſtrong ſmell, and of a pungent acrid taſte. They are volatile at a heat leſs than 212°. And they give a greaſy ſtain to paper, but evaporate without leaving any mark. Volatile oil, however, may be detained in a higher heat by mechanical mixture with dry clay or ſand; and then it undergoes a partial decompoſition, carburetted hydrogen being given out, and a little charcoal remaining in the receiver; the undecompoſed reſidue, if ſubjected three or four times ſucceſſively to ſimilar treatment, will be entirely deſtroyed.

The following table exhibits the moſt prominent properties of ſome of the volatile oils.

TABLE of Volatile Oils.

| Names. | Colour. | Specific Gravity. | Conſiſtency at 60°. Freezes at 14°. | Odour. |
|---|---|---|---|---|
| Turpentine | None. | .792 | Fluid as water. | Strong. |
| Juniper | Green. | .611 | Very fluid. | Strong ſmell. |
| Roſemary | None. | .934 | Thin liquid. | Like the plant. |
| Mint | None. | .975 | Very fluid. | Agreeable. |
| Cloves | None. | 1.034 | Oily and very fluid. | Very fragrant. |
| Lemon | Yellow. | | Thin liquid. | Very agreeable. |
| Orange | Yellow. | .888 | Ditto. | Nearly ſimilar. |
| Cinnamon | Yellow. | 1.035 | Oily and leſs liquid. | Pleaſant. |
| Saſſafras | None. | 1.094 | Oily. | Like the root. |
| Fennel | | .997 | Becomes ſolid at 50°. | |
| Tanſy | | .946 | | Very ſtrong. |
| Dill | | .994 | | |
| Carraway | None. | .94 | | Very ſtrong and pungent. |
| Penny Royal | | .978 | | Agreeable, like the plant. |
| Cuſhmin | | .975 | | |

Nutmegs

| Names. | Colour. | Specific Gravity. | Conſiſtency at 60°. Freezes at 14°. | Odour. |
|---|---|---|---|---|
| Nutmegs | None. | ·948 | Like butter. | Very pleaſant. |
| Aniſeed | None. | | Becomes ſolid at 50°. | Very ſtrong. |
| Thyme | Brown. | | Cryſtallizes. | Like camphor. |
| Spike | Yellow. | ·936 | | Very ſtrong. |
| Lavender | None. | | Thin liquid. | Very agreeable. |
| Origanum | | ·94 | | Very ſtrong and acrid. |
| Wormwood | Green. | | | |
| Camomile | Blue. | | | |
| Hops | Green. | | Like butter. | Like the flower. |
| Parſley | Green. | | | |
| Bergamotte | Yellow. | | Not oily. Is ſolid at 23°. | Very pleaſant. |
| Cardamom | None. | | Oily. | |
| Mace | | | Oily. | Agreeable. |
| Roſes | None. | | | |
| Peppermint | Green. | | Thin liquid. | Very agreeable. |
| Savine | None. | | | Diſagreeable. |
| Pepper | None. | | Like butter. | Very acrid. |

When the volatile oils are recently diſtilled they evaporate without leaving any reſiduum. They are diſtilled with greater facility when water or alcohol is preſent. After they have been expoſed to the air for ſome time they do not entirely evaporate, but a ſlight reſiduum is left of the nature of reſin. When deprived of heat to a certain extent they become ſolid, having an unctuous appearance. Some of them aſſume the cryſtalline form.

It has been aſſerted by Tingry, that light has the property of increaſing the abſolute weight of the volatile oils when expoſed in a cloſe glaſs veſſel, the air at the ſame time being excluded. This fact, however, ought to be doubted, till confirmed by ſtronger evidence. This he attributes to the fixation of light, a thing at preſent unknown to chemiſts. The eſſential oils, eſpecially the more volatile of them, deoxygenate atmoſpheric air very completely, as was firſt aſcertained by Dr. Prieſtley, and this circumſtance partly accounts for the uneaſy ſenſations experienced by moſt perſons when in a cloſe newly painted room.

The action of oxygen upon theſe bodies is very conſpicuous. They become viſcid, and aſſume a yellow colour. The colour becomes deeper, more eſpecially if it is expoſed to the ſun, and the oil ultimately aſſumes the form of reſin. In thick oils another change takes place; a weakly acidulous water is produced, and priſmatic cryſtals are depoſited; the reſidue of the oil becoming, in the mean time, concrete. Theſe cryſtals, which have been occaſionally miſtaken for camphor, are ſlightly ſoluble in hot water, and more ſo in alcohol; to which they communicate the property of reddening vegetable blues; when gently heated, they ſwell and cryſtallize in needles by cooling; when heated by the blowpipe they evaporate, but do not inflame; from theſe properties they have been conſidered as an acid very analogous to the benzoic. Some eſſential oils afford real camphor by evaporation, as Prouſt has ſhewn. (See CAMPHOR.) If the maſs ſo changed into reſin be ſubjected to diſtillation, an oil ſimilar to the original comes over, leaving behind a reſin of greater hardneſs, and more infuſible than the original maſs. Almoſt all the ſubſtances denominated reſin are capable of affording a portion of an eſſential oil by the action of heat, the reſin becoming harder and leſs fuſible. It is on theſe facts that the art of japanning depends. If the ſurface of any body be covered with common tar, and then expoſed to the heat of a ſtove for a certain time, the oily part evaporates, leaving a hard coating, which does not ſoften at a heat ſhort of that which would decompoſe it, and at the ſame time ſo hard as not to be penetrable by the nail. Common pitch and reſin are of different degrees of ſoftneſs, according to the extent to which the diſtillation has been carried. The change produced in the volatile oils, by expoſure to the air, has been ſuppoſed to ariſe from the abſorption of oxygen, but in all probability this is not the fact. That oxygen diſappears is undeniable, but that it is retained in the body is doubtful. We are informed by Fourcroy, that drops of water are formed when oxygen is expoſed over oil of turpentine. Hence it is highly probable, that the oxygen combines with the hydrogen of the oil, forming water, which leaves a compound having leſs hydrogen, and in conſequence more fixed and hard.

The volatile oils, from the great quantity of hydrogen they contain, take fire with great facility, and burn with a copious white flame, producing much ſoot. If the products of combuſtion be collected, they will be found to conſiſt of water and carbonic acid, derived from the carbon and hydrogen of the oil, with the oxygen of the atmoſphere.

It is by this means that we are to expect an analyſis of theſe ſubſtances, an object which has not yet been accompliſhed, but which is very deſirable.

The volatile oils do not undergo any change with hydrogen or carbon. They combine to a certain extent with ſulphur, by which they acquire a browniſh colour, and diſagreeable ſmell. This ſulphurized oil gives out on diſtillation ſulphuretted hydrogen; it is often called "balſam of ſulphur."

It is ſaid that theſe compounds are decompoſed by heat with a violent effervescence, which is ſuppoſed to ariſe from the ſulphur combining with the hydrogen, forming ſulphuretted hydrogen.

Camphor, which may be deemed a concrete volatile oil, combines with phoſphorus by trituration. This compound may afterwards be diſſolved in moſt of the volatile oils. The ſolution is luminous when expoſed to the air, ſo as to tell the hour of the night.

Water has little action upon the volatile oils. The water, however, diſſolves as much as gives it a ſtrong taſte of the oil. When the oil is firſt dropped upon ſugar, and this put into water, a greater quantity is retained. Advantage is frequently taken of this fact in pharmacy.

They are moſtly ſoluble in alcohol and ether, though in limited proportions.



The

The alkalies have much leſs action upon the volatile oils than upon the fixed oils. They are more ſuſceptible of combining with theſe bodies, in proportion as they approach the ſtate of reſin. Common turpentine combines with potaſh, while oil of turpentine is but with difficulty made to unite with it. This has been called *Starkey's ſoap*.

We are in poſſeſſion of ſome facts relative to the action of acids upon the oils.

The ſulphuric acid diſſolves them, and mutual decompoſition takes place. The colour becomes dark, and charcoal is at length depoſited. When water is poured upon the ſolution, a reſinous maſs becomes ſeparated. Hence it appears, that the oxygen of the ſulphuric acid produces a ſimilar change with the oxygen of the atmoſphere.

The nitric acid, when poured upon moſt of the eſſential oils, cauſes them to inflame with great violence, leaving behind a ſpongy coal of a brown colour. The acid ſhould be very ſtrong for this experiment.

Muriatic acid ſlightly diſſolves theſe ſubſtances, but we have no facts as to their mutual change.

It may eaſily be conceived, that many of the metallic oxyds will produce the ſame changes upon the volatile oils which are produced by the acids, and the oxygen of the atmoſphere. The facility with which lead, mercury, and manganeſe give up their oxygen, offers a ready method for an accurate analyſis of theſe bodies.

The volatile oils are uſed in medicine, and are conſidered ſtimulants. They are alſo uſed as perfumes; and in the compoſition of varniſhes and oil paints.

*Fixed, Vegetable, or Unctuous Oils.*—The fixed oils have the following characters:

1. They are greaſy to the touch.

2. They are moſtly liquid, or rather in the ſtate of a moderately thick, but not viſcid, fluid, at the common temperature of the atmoſphere, but become ſolid at certain degrees below.

3. They do not boil at leſs than 600°.

4. They take fire at a certain temperature, and burn with different degrees of brilliancy.

5. They are not acrid like the volatile oils, but frequently almoſt inſipid, or poſſeſſing a mild ſub-nauſeous taſte, and a peculiar flavour, according to the vegetables from which they are produced. Their colour, when recent, has more or leſs of a greeniſh tinge, which by keeping becomes yellow, and in ſome inſtances orange-coloured, verging on red. Their ſpecific gravity is uſually between that of alcohol and water, as they ſink in the former, and float on the ſurface of the latter. Of theſe fluids, there is no circumſtance in which they differ ſo much as in the temperature at which they congeal: ſome continue ſolid at the higheſt atmoſpherical temperature, as palm oil, and the reſt of the vegetable "butters," as they are called from this circumſtance; others require being cooled down to the freezing point of water; and others, again, are capable of enduring a much greater degree of cold without becoming ſolid.

6. They are inſoluble in water and alcohol.

7. They leave a ſtain on paper, which cannot be removed by evaporation.

Fixed oils are ſo called, becauſe they are incapable of being volatilized by heat without decompoſition. When any of them, *e. g.* olive oil, is heated in a cloſe diſtillatory apparatus, as ſoon as the fluid has arrived at its boiling point, a white vapour is diſengaged, conſiſting of oil, carburetted hydrogen, and carbonic acid. The firſt of theſe is for the moſt part condenſed in the receiver; while the other two, retaining in ſolution a portion of oil, eſcape in the form of permanent gas: and when every thing volatile has been driven off, nothing remains in the retort but a little charcoal. The oil which is found in the receiver is lighter, more limpid and volatile, than that from which it was procured; and theſe qualities are obſerved to increaſe by each ſucceſſive diſtillation; carbon and carburetted hydrogen being diſengaged as at firſt. By continuing this proceſs with the product of each diſtillation, the oil at length entirely diſappears, being partly decompoſed, and partly carried off in ſolution by the carburetted hydrogen gas.

They are principally procured from the cotyledons of ſeeds, and ſometimes, though rarely, from the pulp or fleſh of fruits. The ſubſtance containing the oil is beaten to a pulp, and then heated to a certain temperature. It is then ſubjected to the action of a ſtrong preſs, to force out the oil. Much of the mucilage is carried off with the oil. This is more particularly the caſe when the pulp is heated. If it be preſſed cold, the oil is much freer from colour, and in a ſtate of greater purity; but the quantity obtained is leſs. The oil obtained in this way is ſaid to be *cool drawn*. If the heat be too great, the oil will be more coloured. The kernels of the common nut, the walnut, and the hickory nut, yield an abundance of oil: it is alſo expreſſed from the ſeeds of the lint, the rape, the poppy, and the ſun-flower; and in great abundance from the exterior ſubſtance of the olive. All the fixed oils, except the latter, are obtained from the cotyledons of ſeeds; and it is remarkable that no ſeed with one cotyledon affords a fixed oil. Oil may be extracted not only by preſſure, which is the moſt common method, but by immerſion in hot water. In this latter caſe, the oil ſeparates from the other ingredients with which it is naturally mixed, and riſes by the force of gravity to the ſurface of the water, from which it is ſkimmed off. Recently drawn oil is more or leſs impure, on account of its containing a variable proportion of mucilage, fecula, and perhaps other ſubſtances: of theſe a part is always depoſited by reſt, eſpecially if the contact of the air is not wholly excluded; but another portion remains in permanent ſolution; and to this that partial ſpontaneous decompoſition in oils, called "rancidity," is principally owing. They are alſo obtained from animals, ſuch as whale oil and neat's-foot oils.

All animals, except thoſe included in the claſs of inſects, contain oil; the quantity of which, as well as its ſituation in the body, is ſubject to conſiderable variety. (See Cellular *Membrane*, Adeps, and Sebacic *Acid*. See alſo *Anatomy of* Birds, Fish, and Mammalia.) While the fat remains in the living body, it is always in a fluid or ſemi-fluid ſtate; but its conſiſtence changes, when it is extracted and expoſed to the common temperature. The oil or fat, inveſting the kidnies of quadrupeds, is called ſuet or tallow, and is the hardeſt and moſt ſolid of any; the next in hardneſs is the fat of the bones, and that in which the muſcles are imbedded is the next in degree: the fat of the hog, called "lard," is the leaſt ſolid. The fat of birds is ſeldom ſo ſolid as hog's lard, and in many ſpecies is actually fluid. The fat or oil of fiſh is almoſt always fluid at the common temperature. There is alſo fat in the yolk of eggs, which may be extracted by ſimple preſſure, after the yolk has been coagulated by heat.

Animal oil is obtained in its pureſt ſtate by ſhredding freſh ſuet, and liquefying it in boiling water, and then paſſing it through a piece of thin gauze, in order to ſeparate the cellular membrane. Thus purified, its colour is yellowiſh-white: it is moderately hard, of a mild taſte, and almoſt deſtitute of odour or flavour; it is combuſtible, like the fixed vegetable oils, and agrees with theſe in the changes produced upon it by the alkalies and other chemical re-agents.

All

All the animal oils belong to the claſs of unctuous or fat oils, none of them being either drying in themſelves, or capable of becoming ſo by means of litharge and other ſubſtances. Fat, expoſed to dry diſtillation, when it acquires the temperature of about 400°, emits a white acrid and diſagreeable vapour: as the heat increaſes, ſome of the oil comes over into the receiver, and that which remains in the retort acquires a blackiſh tinge; empyreumatic, acetous, and ſebacic acids manifeſt themſelves, together with carburetted hydrogen and carbonic acid of a very offenſive odour. Hence it is inferred that there is a real difference between animal and vegetable oils, though it has not been pointed out by chemical analyſis. The coarſer kinds of animal oil, extracted by putrefaction and a ſtrong heat, poſſeſs a much more diſagreeable odour than any of the vegetable oils; and, when rancid, diſengage ammonia by the action of the fixed cauſtic alkalies, in which they alſo differ from the latter. The fiſh oils, always rancid, are for the moſt part thick and glutinous, which renders them in ſome degree unfit for burning, and ſome other uſes to which they are applied. Many attempts have been made to meliorate them; and it appears by the experiments of Mr. Doſſie, that they may be conſiderably improved by means of fixed alkali and chalk, by which the albumen and gluten are thrown down, and the ſupernatant oil, after due reſt, may be poured off in a fluid ſtate, and very ſenſibly amended in conſiſtence, odour, and fitneſs for burning. Animal oils are ſubſtances of very great economical importance. They are uſed as food, and in medicine as the baſis of various unguents: they are largely employed in the manufacture of ſoap, and alſo for burning either in lamps or in the form of candles. Aikin's Dict.

Whale oil is much contaminated by different animal matters, to which it owes its diſagreeable odour. It has, however, been ſo purified as to poſſeſs leſs ſmell and taſte than the beſt olive oil.

All the fixed oils are of leſs ſpecific gravity than water; and ſince they do not combine, the former muſt float upon the ſurface of the latter.

The fixed oils cannot be diſtilled without decompoſition. They boil at 600°: a vapour comes over, which condenſes into an oil, which is different from the original. An inflammable gas is diſengaged, and ſome coal depoſited. This is ſome proof that decompoſition takes place. From theſe facts we may fairly conclude, that the oil of lamps and candles, when in the act of burning, undergoes decompoſition. The inflammable gas and the vapour conſtitute the volatile part which makes the flame, while ſome carbon is ſeparated, which lodges in the wick.

Fixed oils are divided into two orders: (*a*), *fat oils*, and, (*b*), *drying oils*.

(*a*). *Fat Oils.*—Theſe are ſuch as, when expoſed to the air for a certain time, firſt become viſcid, and ultimately concrete, having the appearance of tallow, and in every reſpect ſimilar to fat. This oil will be more or leſs hard, according to the time expoſed: it at the ſame time acquires a diſagreeable odour, to which we give the name of rancidity. Of theſe kinds we may mention olive oil, almond oil, and that extracted from rape ſeed, called rape oil. This change is more rapidly brought about by dilute nitric acid, or any ſubſtance which affords oxygen. It has been ſuppoſed that the combination of the oxygen with the oil gives to it the concrete form. It is, however, to be regretted that we have not as yet learned from any experiments, whether the abſolute weight of the oil be increaſed or diminiſhed by the agency of the oxygen. It ſeems moſt plauſible to ſuppoſe, that the oxygen combines with a portion of hydrogen of the oil, forming water, leaving the remainder more concrete and leſs fuſible. Olive oil, by treating it with nitric acid, may be rendered equally infuſible with ſpermaceti.

The fat oils combine with the alkalies, earths, and moſt metallic oxyds, forming ſoaps. See SOAP.

They are not miſcible with water, except through the medium of ſugar, ſtarch, or gum. With the two latter they form compounds, called *emulſions*.

They do not combine with many of the combuſtible bodies. They unite with ſulphur, forming a dark brown compound of a diſagreeable ſmell. On cooling, ſome of the ſulphur is depoſited in cryſtals. Phoſphorus combines with ſeveral of the fat oils. Olive oil, when rubbed with phoſphorus in a mortar, diſſolves a portion of it. The ſolution, when expoſed to the air, by opening the bottle containing it, becomes very luminous. Any ſubſtance ſmeared with it ſhines for ſome time, but no perceptible heat is produced.

When concentrated ſulphuric acid is poured upon the fixed oils, decompoſition ſpeedily enſues. The products are water, carbon depoſited, giving a black colour. The ſulphur is alſo depoſited, and ſome acetic acid formed. When concentrated nitric acid is poured upon oils, the action is conſiderable; the oil takes fire, and burns, leaving a ſpongy coal behind. If the acid be dilute, as has been obſerved, it converts the fat oils into fat like tallow.

The fixed oils combine with ſome of the metals. A leaden veſſel ſoon becomes corroded by oil contained in it; the oil at the ſame time becoming thicker. They have ſcarcely any action upon tin; hence the uſe of the latter metal in preference to the former for oil veſſels. Oil has alſo a decided action upon iron, as we ſee in the axle-trees of carriages, and in all inſtances in which oil is uſed with iron to leſſen friction.

*b. Drying Oils.*—Theſe oils poſſeſs properties moſtly common to both, but differing in ſome particulars. They, like the fat oils, become concrete by the action of oxygen; but inſtead of aſſuming an opaque fatty appearance, they retain their tranſparency, and acquire the flexible property of horn.

The varieties poſſeſſing this property are the oils of nut, poppy, and lint.

Theſe oils are leſs fitted for combuſtion than the fat oils, but are of great uſe for paints and varniſhes, and making printers' ink. When uſed for the latter purpoſe the nut oil is preferred, on account of its not turning yellow. It is firſt ſet on fire, and allowed to burn for a ſhort time; it is then covered by a lid to extinguiſh it, and allowed to boil for ſome time. By this treatment it loſes its greaſy quality, becomes thick and ropy, and is more miſcible with water, a property of great importance in the above application. Drying oils become more ſuſceptible of the concreting quality by being boiled with litharge, or almoſt any ſubſtance containing oxygen. Doubtleſs in this proceſs the oxygen of the lead combines with the hydrogen of the oil, while the lead combines with the oil, to which it gives a dark colour, and makes it thicker. Acetat of lead, and other metallic ſalts, produce the ſame change.

When oil is mixed with the black oxyd of manganeſe, it ſome time after takes fire. This ariſes from a more rapid combination of the oxygen of the oxyd with the hydrogen of the oil.

The compoſition of the fixed oils has been given by Lavoiſier, but it is not to be relied upon. He makes it conſiſt of 79 carbon, and 21 hydrogen.

Another ſpecies of oils is found in ſome vegetables, which have an acrid taſte, and diſſolve in alcohol, like the volatile

volatile oils, but are not ſo volatile as to admit of diſtillation. The vegetable containing the oil is infuſed in alcohol, which diſſolves the oil. The alcohol is afterwards diſtilled from the oil.

Theſe oils are ſaid to be poiſonous, which appears to be their moſt diſtinguiſhing character. An oil of this kind is obtained from the root of the helleborus hyemalis, and another is found in tobacco.

Oils, *Empyreumatic*.—Theſe approach the nature of volatile oils, and are formed during the diſtillation of vegetable and animal ſubſtances. They have properties nearly allied to tar, and afford, by a ſecond and careful diſtillation, a liquid volatile oil, not much unlike the oil of common tar, which has many properties in common with oil of turpentine. A ſimilar ſubſtance is obtained from pit-coal by diſtillation, which oil belongs alſo to this claſs.

The colour of empyreumatic vegetable oil is yellowiſh-red, paſſing into blackiſh-red; it has a ſtrong odour, and an acrid empyreumatic taſte; it is more volatile than the fixed oils, but leſs ſo than the proper eſſential ones; by re-diſtillation with a little water it almoſt wholly loſes its colour, and becomes more volatile than before, though ſtill poſſeſſed of much of its empyreumatic flavour. See Aikin's Dict.

The uſe of oil in ſtopping the violent ebullition of various ſubſtances, may be very great in many occaſions of life. It is well known that if a mixture of ſugar, honey, or the like, be boiling on the fire, and in danger of riſing over the ſides of the veſſel, the pouring in a little oil immediately makes it ſubſide. In many caſes, the marking a circle round the inſide of a veſſel, in which a liquor of this kind is to be boiled, with a piece of hard ſoap, ſhall, like a magic ring, confine the ebullition to that height, and not ſuffer it to ſtir any farther. This is wholly owing to the oil, or fat, contained in the ſoap; but there is, beſides theſe, another very important uſe of oil, on a like occaſion, which is the pouring a little of it on any metallic ſolution, while making; this reſtrains the aſcent of the noxious vapours; preſerves the operator from danger; and, at the ſame time, by keeping down the evaporating matter, gives redoubled ſtrength to the menſtruum.

Pliny has mentioned an extraordinary effect of oil, in ſtilling the ſurface of water when it is agitated with waves, and the uſe made of it by the divers, for this purpoſe. "Omne," ſays he, "oleo tranquillari," &c. lib. ii. cap. 103. and Plutarch, in Quæſt. Natur. aſks, "Cur mare oleo conſperſum perlucidum ſit et tranquillum?" Pliny's account ſeems to have been either diſcredited or diſregarded by our writers on experimental philoſophy, till it was confirmed by ſeveral curious experiments of Dr. Franklin, which were publiſhed in the year 1744.

The property of oil above-mentioned has, however, been well known to modern divers and dredgers for oyſters, at Gibraltar, and elſewhere. The divers in the Mediterranean, in particular, deſcend, as in Pliny's time, with a little oil in their mouths, which they now and then let out; and which, on riſing to the ſurface of the ſea, immediately renders it ſmooth, ſo as to permit the light to paſs through the water, undiſturbed by various and irregular refractions.

The Bermudians, it is ſaid, are enabled to ſee and ſtrike fiſh, which would be concealed from their view, through the roughneſs of the ſea, by pouring a little oil upon it. And the Liſbon fiſhermen effect a ſafe paſſage over the bar of the Tagus, by emptying a bottle or two of oil into the ſea, when the ſurf is ſo great as to endanger its filling their boats. Our ſailors have alſo obſerved, that the water is always much ſmoother in the wake of a ſhip that hath been newly tallowed than it is in one that is foul.

Dr. Franklin was led, by an accidental obſervation made at ſea in 1757, to attend particularly to Pliny's account; and the various informations which he afterwards received relating to it, induced him to try ſome experiments on the ſubject. Standing on the windward ſide of a large pond, the ſurface of which was rendered very rough with the wind, he poured a tea-ſpoonful of oil on the water. This ſmall quantity produced an inſtant calm over a ſpace of ſeveral yards ſquare, which ſpread amazingly, and extended itſelf gradually, till it reached the lee-ſide, making all that quarter of the pond, perhaps half an acre, as ſmooth as a looking-glaſs. On repeating this experiment, which conſtantly ſucceeded, one circumſtance ſtruck him with particular ſurprize; this was the ſudden, wide, and forcible ſpreading of a drop of oil on the face of the water, which, he adds, "I do not know that any body has conſidered."

When a drop of oil is put on a looking-glaſs, or poliſhed marble, it ſpreads very little: but on water it inſtantly expands into a circle extending ſeveral feet in diameter, becoming ſo thin as to produce the priſmatic colours for a conſiderable ſpace, and beyond them ſo much thinner as to be inviſible, except in its effects of ſmoothing the waves at a much greater diſtance. It ſeems, ſays Dr. Franklin, as if a mutual repulſion between its particles took place as ſoon as it touched the water, and a repulſion ſo ſtrong as to act on other bodies ſwimming on the ſurface, as ſtraws, leaves, &c. forcing them to recede every way from the drop, as from a centre, leaving a large clear ſpace. The quantity of this force, and the diſtance to which it will operate, the author ſays, he has not yet aſcertained; but he thinks it a curious enquiry, and wiſhes to underſtand whence it ariſes. In endeavouring to account for the ſingular effects of oil, Dr. Franklin obſerves, that there ſeems to be no natural repulſion between water and air, ſo as to keep them from coming into contact with each other. Therefore air, in motion, which is wind, in paſſing over the ſmooth ſurface of water, may rub, as it were, on that ſurface, and raiſe it into wrinkles, which, if the wind continues, are the elements of future waves. The ſmalleſt wave does not immediately ſubſide, but in ſubſiding raiſes nearly as much of the water next to it. A ſmall power, continually operating, will produce a great action: ſo that the firſt raiſed waves, being continually acted upon by the wind, are, though the wind does not increaſe in ſtrength, continually increaſed in magnitude, riſing higher and extending their baſes, ſo as to include a vaſt maſs of water in each wave, which, in its motion, acts with great violence. But if there be a mutual repulſion between the particles of oil, and no attraction between oil and water, oil dropt on water will not be held together by adheſion to the ſpot on which it falls; it will not be imbibed by the water; but be at liberty to expand itſelf and ſpread on a ſurface, that prevents, perhaps, by repelling the oil, all immediate contact; the expanſion will continue till the mutual repulſion between the particles of oil is weakened, and reduced to nothing by their diſtance.

Dr. Franklin imagines, that the wind blowing over water, thus covered with a film of oil, cannot eaſily catch upon it, ſo as to raiſe the firſt wrinkles, but ſlides over it, and leaves it as ſmooth as it finds it. It moves a little the oil, indeed, which being between it and the water, ſerves it to ſlide with, and prevents friction: hence the oil dropt on the windward ſide of the pond proceeds gradually to leeward, as may be ſeen by the ſmoothneſs it carries with it quite to the oppoſite ſide: for the wind, being thus prevented from raiſing the firſt wrinkles, which he calls the elements of waves, cannot produce

produce waves, which are to be made by continually acting upon and enlarging thoſe elements, and thus the whole pond is calmed.

Upon the whole, there is great room to ſuppoſe (notwithſtanding the partial failure of an experiment made at Portſmouth, by Dr. Franklin, and others), that ſea-faring people may derive advantages from uſing oil on particular occaſions, in order to moderate the violence of the waves, or to leſſen the ſurf, which ſometimes renders the landing on a lee-ſhore dangerous, or impracticable.

To this purpoſe we are informed that the captain of a Dutch Eaſt India ſhip, being overtaken by a ſtorm, found himſelf obliged, for greater ſafety in wearing the ſhip, to pour oil into the ſea, to prevent the waves breaking over her, which had an excellent effect, and ſucceeded in preſerving her. Phil. Tranſ. vol. lxiv. part. 2. p. 445, &c.

Oil, in *Agriculture*, a fatty unctuous material, obtained from animal as well as vegetable ſubſtances. Theſe matters are diſtinguiſhed into different kinds, as ethereal or eſſential, and fat or fixed oils: the former are acrid, volatile, odoriferous, and exiſt in the plants in the ſame ſtates in which they are found; while the latter are fixed, deſtitute of odour, and mild to the taſte. Theſe laſt, when kept a long time, corrupt and become rancid. They do not act upon earths, but readily combine with alkaline ſalts, with which when cauſtic they form vegetable ſoaps.

Though theſe matters cannot be employed by the farmers in their ſimple ſtates, as being too expenſive, and having rather a noxious or poiſonous effect, than a beneficial one on the growth of plants, they may frequently be uſed in the condition of compoſts with advantage, as has been the caſe in the application of various of the groſſer ſorts of materials of this nature, ſuch as thoſe of whale blubber, the bottoms and refuſe of oil caſks, &c. when blended with earthy materials, ſo as to be laid upon the land in an even and regular manner. And in this ſtate of combination they have been found, by the experiments of different cultivators, to form very ſtrong and powerful manures.

The account of Mr. C. Baldwin's trials made with the bottoms or *foots* of oil, and a rich thick South-ſea whale oil, in the whole ſixty gallons, is thus ſtated.

Having a platform or bottom of twenty loads of mould, with eight loads of dung on it, he carried on three loads of light ſandy mould, and one load of brick and mortar rubbiſh, ground fine, and having mixed theſe well, and made a kind of diſh of it, about five feet wide and ten feet long, with a ladle he had put over it one-half of the oil. It was in Auguſt, and the warmth of the ſun ſoon made the thick oil ſoak into the compoſt, when it was directly thrown up in a heap, broke down again, and by five or ſix turnings well mixed together, and left in a heap two days, when it was ſpread equally over the whole dunghill; twenty loads more of good mould were then carried on, eight loads of dung, and the remaining thirty gallons of oil were mixed as before, in ſandy mould, and brick and mortar rubbiſh, and equally ſpread over, and the whole was covered by trimming the four ſides of the dunghill, and throwing it on the top. And thus the dunghill lay more than two months, when it was cut down by mattocks, carefully broke, well mixed, and turned over. The end of March it was carried on the field, ſpread and ploughed in; it lay about a fortnight, and was then ploughed again, and on the 22d of April it was drilled with the Rev. Mr. Cooke's excellent drill. The field was drilled with barley, two buſhels to the acre; the crop came up in a moſt even and beautiful manner; every ſeed was up within forty-eight hours of each other; all was ripe at the ſame time, and, from a couple of months after ſeed-time to harveſt, was rated by all who ſaw it, and it was ſeen by many, as a ſixty buſhel crop. At harveſt, three rows were cut acroſs the field, directly thraſhed and meaſured; one load out of thirteen was alſo thraſhed and meaſured, and both ſtated the crop to be ſixty buſhels; but to wave all poſſibility of diſpute or doubt, he is content to ſtate the crop at ſeven quarters *per* acre. As to the quality of the barley, he could here cite the opinion of one of the moſt eminent brewers in London, who ſaw the crop growing, and declared he would readily give 1000*l.* to be aſſured that all the barley crops in the kingdom were of equal burthen and weight; five quarters of it have been lately ſent to Nethrapps, in Norfolk, as ſeed-barley, under the denomination of 15 comb-barley; and an eminent maltſter tells him it weighs 220lbs. *per* ſack, or 55lbs. *per* buſhel, Wincheſter meaſure. It is added, that among the many gentlemen and farmers who ſaw the crop on the ground, was the celebrated Mr. Bakewell; he came with three or four others, and walking down the field, obſerved the hedge and bank; the bank, upon being touched with a ſtick, run down as ſand and gravel generally do, and Mr. Bakewell being aſked his opinion of the value of the land, if he does not miſtake, valued it at 18*d.* *per* acre, but turning to the crop, and deſiring his friends to do ſo alſo, he admitted that it ſeemed as if growing on land of 15*s.* or 20*s.* *per* acre. He muſt not omit ſaying that the barley followed oats, upon a lay of ſix years old; that the land was, as is too common in ſuch caſes, much infeſted with the little red or wire worm, and that the oats ſuffered much from them; when they were ploughing for the barley the firſt time, he obſerved many turned up by the plough, when a diſtant ray of hope inſtantly darted upon his mind, that the ſoil in its then ſtate, or from its ſtrong effluvium, might prove obnoxious to them, and he is happy in ſaying, that the barley did not ſuffer from them in the leaſt.

It is further ſtated, that he is trying the experiment in Hampſhire, having laſt autumn made up a dunghill, with twenty gallons of oil, on one-third of it for a ſix-acre field, which is now drilled with peaſe.

And he concludes by obſerving, that it is well known that all animal ſubſtances, in a ſtate of corruption, wonderfully promote vegetation, and are the actual food of plants. The whale-oil which he uſed is an animal ſubſtance, perhaps the richeſt part of the animal; whether he uſed enough, or what is the proper quantity *per* acre, experience muſt point out; ſay he uſed eight loads of mould, three or four loads of dung, and twelve gallons of whale-oil *per* acre. That oil applied to land, as a food for plants, in its crude ſtate, acts as a poiſon he cannot deny; but his proceſs is very different: he believes that oil, particularly animal-oil, is the pabulum of plants, that is, oil ſubtilized by the ſalts in a compoſt dunghill, left there a conſiderable time in a ſtate of putrefaction, and until the whole is become putreſcent; then he believes he has got the beſt and richeſt manure that can be carried on land. The barley evidently proved its excellence; a ridge of ſummer cucumbers in his garden pointed out to many its great power, the leaves being in general from ten, to ten and a half inches broad, and the vines occupied an uncommon ſpace of ground. Five hundred cabbages and ſavoys, planted by the ſide of four thouſand more, and which had only one handful of the oil manure put in each hole made by the dibble at the time of planting, were evidently near as big again as the others. See Oil-*Compoſt*.

Oil-*Cake*, the cake which remains after the oil has been expreſſed from flax, rape, and ſome other ſorts of ſeeds. Cakes of the firſt ſort are found to be extremely beneficial in the fattening of cattle, ſheep, and other animals, in different

diſtricts, where they are made uſe of upon an extenſive ſcale.

A recent writer has ſtated, that the late advances in the price of this article, have probably rendered it incapable of being made uſe of with much profit, except in particular caſes, and where manure is a principal object: with this ſort of food it is the common practice to give ſome other ſort of meat, ſuch as hay, cut chaff, and other ſubſtances of the ſame nature, and ſome begin by giving to a beaſt of a hundred ſtones, two cakes *per* day of about ſix pounds each, for ſix or eight weeks, and then increaſe them to three, till the animals become fat: at firſt, however, as the animals ſeldom like it, much leſs may be found ſufficient. In addition to the cake, from half a ſtone to a ſtone of hay is given each day, the whole conſumption in cake being about 21 cwt., and in hay 26 cwt., which at the prices previous to the late advance on theſe articles, rendered the expence of winter-fattening an animal of the above ſize ſomething more than ſeven guineas: lean cattle of the ſmaller kinds have been made perfectly fat in the courſe of eight or ten weeks by this ſubſtance in the trials of Mr. Moody. The cake in this application is broken down into ſmall parts, and frequently blended with the chaff or other ſubſtances that are made uſe of with it. On the continent, Mr. Young ſays, linſeed cake is ſometimes exhibited in a liquid ſtate, being diffuſed in hot water, and drank by the cattle, hay and other ſubſtances being given at the ſame time. And in the Lincolnſhire report, a method is ſuggeſted of giving cake to cattle while in the paſtures in a ſmall proportion, with great ſucceſs, a practice which may be applicable, where the cake-fed beaſts are not fully fattened for ſale in the early ſpring months. It is an advantage in fattening with this and other ſimilar ſubſtances, that the animals may be completed with them at much more advanced ages than in other modes of fattening.

But wherever this expenſive ſort of food is employed, great care ſhould be taken that the cakes be freſh, good, and free from mouldineſs. They are the beſt where the expreſſion of the oil has not been carried too far, but where this has happened they are moſtly deficient in nouriſhment.

It has been ſtated by Mr. Donaldſon, that in Lancaſhire, Yorkſhire, Norfolk, and a few other diſtricts, they ſometimes uſe oil-cakes of the latter kind, after being reduced to powder by means of a machine contrived for the purpoſe, as a manure, ſometimes for wheat and barley crops, but more generally for turnips. It is always ſown by hand, and harrowed in with the ſeed. The quantity uſed is from three to ſix quarters the acre. The price is extremely different in different diſtricts. It was then in Lancaſhire from ſix to eight ſhillings the quarter, in ſome parts of Yorkſhire from ſixteen to twenty. Experience has proved, that the ſucceſs of this manure depends in a great meaſure on the following ſeaſon. If rain happens to fall ſoon after the rape-duſt is applied, the crop is generally abundant, but if no rain fall for a conſiderable period, the effects of this manure are little diſcernible either on the immediate crop, or on thoſe which ſucceed it on the land in the following year.

And in an experiment ſtated in the eleventh volume of the Agricultural Magazine, four ridges, about twenty yards wide each, in the middle of a large field, were alternately manured with lime and rape-ſeed cake. The quantity of lime was, it is ſuppoſed, three chaldrons to an acre. The part oil-caked had a quarter of a ton an acre drilled by a machine, which throws the oil-cake reduced to powder, and the turnip ſeed, into the ſame drills. The ſoil was a ſtrong dry red loam, with a few ſpots of gravel interſperſed in different parts of the field. On theſe gravelly ſpots the turnips were rather ſuperior on the parts which were limed; but on the loam the oil-caked ridges produced, at leaſt, double the weight of thoſe which were limed.

Mr. Calvert, at Albury, when oil-cake was much cheaper than at preſent, found it the moſt advantageous and profitable food that he could give his cows; three cakes a day, with eight or ten pounds of hay, or four cakes and good ſtraw, were the uſual allowance; two were given to cows in calf and growing heifers: he practiſed this till cake advanced beyond 9*l.* a thouſand. How far it may anſwer at much higher prices, hay and butter having both greatly advanced, careful experiments will alone aſcertain, which he himſelf ſhould have made, but, Swediſh turnips being introduced and anſwering uncommonly well, he loſt the inducement to go on with the other food. Cake gave very good butter, and at 6*l.* or 7*l.* a thouſand was the cheapeſt food that could be given. Hertfordſhire Agricultural Report.

Good potatoe crops have been raiſed by it in ſome parts of Lancaſhire.

OIL-*Compoſt*, a ſubſtance of the manure kind, prepared by incorporating different oily materials with thoſe of other kinds. It has been highly extolled by ſome cultivators, while others have thought leſs favourably of its properties. It is probable, however, that the expence of articles of this nature muſt render their uſe very limited in moſt ſituations.

But on the ſuppoſition that oil rendered miſcible with water, conſtitutes the chief nouriſhment of vegetables, and affords their principal ſupport; Dr. Hunter of York propoſed the following oil-compoſt.

| | £. | s. | d. |
|---|---|---|---|
| Take North American pot-aſh 12lb. | 0 | 4 | 0 |
| Break the ſalt into ſmall pieces, and put it into a convenient veſſel with four gallons of water. Let the mixture ſtand forty-eight hours, then add coarſe train-oil, 14 gallons | 0 | 14 | 0 |
| | 0 | 18 | 0 |

It may be noticed, that in a few days the ſalt will be diſſolved, and the mixture, upon ſtirring, become nearly uniform. Then take fourteen buſhels of ſand, or twenty of dry mould. Upon theſe pour the above liquid ingredients. Turn this compoſition frequently over, after adding to it as much freſh horſe-dung as will bring on heat and fermentation: in ſix months it will be fit for uſe. And it is apprehended, that the above quantity will be found ſufficient for an acre; his trials, however, do not give him ſufficient authority to determine upon this point. But for the convenience of carriage, he has directed no more earth to be uſed than will effectually take up the liquid ingredients. However, if the farmer chooſes to mix up the compoſt with the mould of his field, he would adviſe him to uſe a larger portion of earth, as he will thereby be enabled to diſtribute it with more regularity upon the ſurface. He has not yet had any extenſive trial of its efficacy upon paſture and meadow grounds; but he preſumes, that whatever will nouriſh corn, will alſo feed the roots of graſs. When uſed upon ſuch lands, it ſhould be put on during a rainy ſeaſon, as all top-dreſſings are injured by the ſolar heat, and all kinds of cattle muſt be kept off the lands for ſome time, as they will bite the graſs too cloſe in queſt of the ſalt contained in the compoſt, which he has found to be the caſe in ſmall trials.

It is added, that the oil-compoſt is only intended to ſupply the place of rape-duſt, ſoot, woollen rags, and other expenſive

expenſive hand-dreſſings. It is in all reſpects inferior to rotten dung: where that can be obtained, every kind of manure muſt give place to it. But at the ſame time that dung affords nouriſhment, it opens the pores of the earth. Hand-dreſſings, on the contrary, give food to plants, but contribute little towards looſening the ſoil. This is an uſeful and practical diſtinction, and may be applied through all the variety of manures made uſe of by the farmer. And it is preſumed, that the oil-compoſt reſembles the natural food of plants; but he ſubmits that, as well as every thing elſe, to experience our unerring guide. It may be objected, that it has not ſufficiently undergone the putrid ferment, to attenuate the oily particles. The uſe of rape-duſt, ſoot, horn ſhavings, and woollen rags, takes off that objection, and at the ſame time confirms the theory upon which the above compoſt is founded. But he does not take upon him to direct the experienced farmer in the manner of uſing this new compoſt. He would have every perſon apply it in the way moſt agreeable to himſelf. Many things will occur to the practical huſbandman, that no reaſoning of the philoſopher could foreſee. By attending to the different ways of uſing it, we may, it is ſuppoſed, reap conſiderable advantages. Improvements may be collected even from the higheſt degree of miſmanagement. And facts muſt ever be the foundation of our reaſoning. Without them, the philoſopher is a kind of *ignis fatuus*. Inſtead of unfolding nature, he covers her with a cloud, and endeavours, as it were, to bring old chaos back again into the world. If, however, he ſhould preſume to inſtruct the farmer in the management of the compoſt, he would recommend it to be ſown immediately after the grain, and both harrowed in together.

The following experiment is ſtated, which, though trifling in its own nature, gave him the firſt encouragement to proſecute the ſubject upon a larger ſcale. He took four pots, Nos. 1, 2, 3, 4.

"No. 1. contained 12lb. of barren ſand, with 1 oz. of the ſand oil-compoſt.

"No. 2. contained 12lb. of ſand without any mixture.

"No. 3. contained 12lb. of ſand, with ½ oz. of ſlaked lime.

"No. 4. contained 12lb. of ſand, with 4 oz. of the ſand oil-compoſt."

And in the month of March he put ſix grains of wheat into each pot, and during the ſummer occaſionally watered the plants with filtered water. All the time that the plants were conſuming the farina, he could obſerve but little difference in their appearance. But after one month's growth, he remarked that No. 1. was the beſt; No. 2. the next; No. 3. the next; No. 4. much the worſt. And in Auguſt he made the following obſervations: No. 1. had five ſmall ears, which contained a few poor grains. No. 2. had three ſmall ears, containing a few grains, much inferior in goodneſs to the former. No. 3. had no ears. Only he obſerved two very ſmall ones within their reſpective ſheaths, which for want of vegetable ſtrength never made their appearance. No. 4. had no ears; the ſtalks appeared ſtunted in their growth.

"He then removed the plants from their pots, and took a view of the roots of each.

"No. 1. The roots tolerably large, and well ſpread.

"No. 2. The roots not ſo large.

"No. 3. The roots very ſhort and ſmall.

"No. 4. The roots much the ſhorteſt, with the appearance of being ricketty."

Upon this experiment it is ſuggeſted,

"1. That the oil-compoſt may be conſidered as a vegetable food; but it, when uſed too liberally, the alkaline ſalt will burn up the roots of the plant, and hinder vegetation. For which reaſon he would recommend the compoſt to be expoſed to the influence of the air for ſome months, before it is laid on. 2. That lime contains no vegetable food, and is, in its own nature, an enemy to vegetation. It is, however, of excellent uſe in aſſiſting vegetation."

Theſe experiments teach him, that all kinds of ſoils may be benefited by this manure. The limeſtone, gravelly, ſandy, and chalky ſoils ſeem to require it moſt. The rich loams and good clays have nouriſhment within themſelves, and ſtand more in need of the plough than the dung-hill. And it is noticed, that it is obſerved by farmers, that rape-duſt ſeldom ſucceeds with ſpring-corn, unleſs plentiful rains fall within a few weeks after ſowing. He has more than once made the ſame obſervation upon the oil-compoſt, which induces him to recommend it for winter crops only. From the unctuouſneſs of its nature, it is more than probable, that it ſhould lie expoſed for a long time to the influence of the weather, which benefit it is deprived of when uſed for barley, and ſuch crops as are ſown late in the ſpring. He is confirmed in this idea, from repeated experiments made with the compoſt upon turnips, which generally proved unſucceſsful. And at the ſame time he invariably found that thoſe parts of the field on which the compoſt had been ſpread produced the beſt crops of grain the following year. From this ſlow manner of giving its virtues, it ſeems to be an improper dreſſing for all plants that have a quick vegetation.

On the whole it is concluded, that the oil-compoſt, as it plentifully reſtores particles of the oily kind, ſimilar to thoſe that are carried off, has a fair appearance of proving an excellent reſtorative.

The following experiments in ſupport of the utility of this ſort of manure are ſtated. In the month of June he ſelected four lands of equal goodneſs in a field intended for turnips. The ſoil was a light ſand, with a ſmall portion of vegetable earth amongſt it. It was ploughed out of ſward in November, and had not borne a crop for many years. He diſtinguiſhed his experimental lands by Nos. 1, 2, 3, 4.

No. 1. was manured with rotten dung.

No. 2. with oil-compoſt.

No. 3. with lime.

No. 4. was left without any dreſſing.

On the 20th of June they were all ſown with turnip-ſeed, broadcaſt, and during the courſe of the ſeaſon were twice hoed.

"In November he viewed the field, and made the following remarks:

N° 1—the beſt.

2—the next.

3—the worſt.

4—better than N° 3.

"Here he ſuppoſes the oil-cómpoſt appears in a favourable light; but other trials, made with equal accuracy, ſeem rather to prove that it is not proper for turnips, barley, or quick growing vegetables. It requires being meliorated by the action of the atmoſphere, and therefore is better adapted to winter crops." But by repeated experiments made ſince he firſt brought forward this manure, he is "convinced that the addition of an alkaline ſalt is not ſufficient to alter the nature of ſoil, ſo as to make it fully capable of entering in to the roots of plants in its native form: but when decompoſed by the mixture of freſh dung, he is convinced that it then becomes the true pabulum of plants."

It is ſuppoſed that "when the land happens to be ſtiffer than is required for turnips, it may be good huſbandry to lay upon it a large quantity of lime to open its body for the free admiſſion of the tap-root of the turnip. The lands will

alſo be rendered more dry, without which the turnips will never arrive at any ſize. Farmers, in general, take great pains to pulverize their light ſoils intended for turnips; but they ſeldom plough deep enough. A turnip is found to root deep, and in all operations of huſbandry we ſhould be careful to follow the bias of nature. It is for that reaſon we ought to make ourſelves acquainted with the ſize and the ſhape of the roots of ſuch plants as are the objects of field huſbandry: when once we have obtained that neceſſary knowledge, it will be an eaſy matter to ſuit the preparation of the ſoil to the nature of the grain. It will alſo enable us to direct the variations of our crops upon juſt and rational principles."

But in Mr. Stovin's trials with oil-compoſt in 1769, the reſults were theſe:

| | £ | s. | d. | Produce. Q. | B. | P. |
|---|---|---|---|---|---|---|
| "One acre, ſown with barley, and manured with oil-compoſt - | 0 | 18 | 0 | 5 | 5 | 0 |
| "One acre adjoining, ſown with barley, and manured with rotten dung, twelve loads, worth - | 3 | 0 | 0 | 4 | 3 | 2 |
| Difference | | | | 1 | 1 | 2 |

And the compoſt barley was bolder and better corn than the other. In the year 1770, the dunged acre produced of rye, three quarters. The compoſt acre, of ditto, two quarters ſix buſhels. And in the year 1771, the ſame lands were ſown with oats, and the produce was greatly in favour of the dunged acre. This laſt experiment, being contrary to the idea of good huſbandry, was made with a view to determine the abſolute ſtrength of the compoſt. All top-dreſſings are exhauſted in the year. The oil-compoſt ſeems to retain its vigour longer. It will here be proper to obſerve, that theſe experimental lands were in a common field, which had been many years under the plough.

Alſo in Mr. Townley's experiments, they were as below. "In the ſpring of 1770, he prepared a piece of ground for onions. It was laid out into ſix beds of equal ſize, and all ſown at the ſame time.

"Over two of them, the oil-compoſt was ſcattered in a very moderate quantity; over the other two, pigeon-dung; and over the remaining two, ſome of his weed-compoſt, which he eſteems one of the beſt manures, for moſt vegetables, that can be made." It is compoſed of vegetable ſubſtances reduced into a putrid ſtate. "The onions came up very well in all the beds: but, in about ſix weeks, thoſe that were fed with the oil-compoſt plainly diſtinguiſhed the advantage they had over the reſt, by their luxuriancy and colour; and at the end of the ſummer perfected the fineſt crop that he had ever ſeen, being greatly ſuperior to the others both in quantity and ſize."

In another experiment with it in this crop, his ſucceſs was ſtill much greater though the ſoil was worn out. The oil-compoſt was uſed as a top-dreſſing after the crop was ſown. "The ſame ſpring he made an experiment upon four rows of cabbages, ſet at the diſtance of four feet every way. Two were manured with the oil-compoſt, and two with his own. All the plants were unluckily damaged, juſt before they began to form, by ſome turkies getting into the field, and plucking off the greateſt part of the leaves. However, they ſo far recovered as to weigh, in the September following, from 22lbs. to 28lbs. a-piece. The rows proved ſo equal in goodneſs that he could not determine which had the advantage."

And "the ſame year one part of a field of wheat expoſed to the north-eaſt winds, which that ſpring continued to blow for a month or five weeks, appeared very poor and languid at the time of tillering. Over it he ordered ſome of the oil-compoſt to be ſown with the hand, which not only recovered, but alſo puſhed forwards the wheat plants in that part of the field, ſo as to make them little inferior, if any, to the reſt."

The ſame ſpring he "made a comparative experiment upon four contiguous lands of oats, between the oil-compoſt and his own weed-compoſt. The latter had manifeſtly the advantage, though the other produced a very fine and large crop. He alſo tried the oil-compoſt upon carrots, and it anſwered exceedingly well. He did the ſame this year (1771), both upon them and his onions; and has the fineſt crops of thoſe vegetables he ever ſaw any where upon the ſame compaſs of ground."

Mr. Roebuck, in trying this manure in gardening, planted twelve alleys, that lay between his aſparagus beds, with cauliflower plants; each alley took up about thirty plants. One of the alleys he ſet apart for an experiment with the oil-compoſt, prepared as above.

"About a handful of the compoſt was put to the root of each cauliflower plant. In all other reſpects the alley was managed like the reſt. The plants in general flowered very well; but thoſe to which he applied the compoſt, ſprung up haſtily with ſmall ſtalks, and produced very poor flowers. He imputed this unfavourable appearance to the freſhneſs of the compoſt, which was only a few weeks old. In all future trials, he intends to expoſe it to the action of the air, in order to abate the heat, and neutraliſe the acrimony of the ſalt."

But "in the September following this unſucceſsful experiment, he planted the ſame alleys with early cabbages. The neceſſity of meliorating the compoſt was in this trial fully confirmed. For the cabbages that grew upon the alley, which in May had received the compoſt, were larger, and in all reſpects finer, than the others. The idea that he entertains of the compoſt is, that when meliorated in the earth, it is capable of giving a richneſs and freſhneſs to it. Upon this principle he would recommend it to gardeners as a ſubject worthy of further trials.

Although theſe experiments ſufficiently ſhew, that ſubſtances of this ſort may be uſed with advantage in the way of manures, their expence muſt in moſt caſes prevent their being made uſe of to any great extent.

Oil-*Manure*, ſuch as is conſtituted of oil with other materials. The compoſition of a manure of this kind, which has been ſaid to be highly beneficial, with the expence for one acre of land in 1792, is thus ſtated:

| | £ | s. | d. |
|---|---|---|---|
| Rape or train-oil ſix gallons, at 2*s.* 6*d.* - | 0 | 15 | 0 |
| Sea-ſand ſix buſhels, at 2*d.* - - | 0 | 1 | 0 |
| Coarſe ſalt two buſhels, at 1*s.* - - | 0 | 2 | 0 |
| Malt coombs 24 buſhels, at 4½*d.* - - | 0 | 9 | 0 |
| | 1 | 7 | 0 |

In the preparation of which, it is adviſed to ſpread the coombs on the floor about four inches thick, then to ſprinkle the ſalt as level as poſſible, throwing on half the quantity of ſand and half the quantity of oil out of a watering-pot, turning it and raking it well, afterwards to add the reſt of the oil and ſand as before, turning it well till thoroughly mixed, and then throw the whole into a heap for uſe. On this it is ſuggeſted, that as the prolific quality of oil-cake is only in proportion to the oil it contains, this compoſition muſt be preferable, having a much greater quantity of oil



in

in it; and as malt coombs are a manure of themſelves, eſpecially for turnip land, at about eighty or ninety buſhels *per* acre, he dares venture to aſſert, that twenty-four buſhels with the addition of oil is equal to the above quantity, or even to the twelve loads of muck. The ſand and ſalt mixed with it, not only occaſion it to imbibe the oil more freely, but likewiſe give it a better body for the conveniency of ſpreading on the land. And though ſome may think the quantity of ſalt is too little, he is convinced of the contrary, having found by experience that a ton or even a ton and a half has not anſwered ſo well as three or four hundred. The caſe is very ſimilar with regard to lands near the ſalt marſhes, where the tide ſometimes overflows them, and it is well known by thoſe who occupy ſuch lands that nothing will grow for three or four years, but afterwards they become very fertile. The reaſon he ſhall not take upon himſelf to give, but he has found it ſo by his own experience. The writer concludes by obſerving, that ſome farmers have uſed only half the above quantity *per* acre, notwithſtanding which they had good crops. But it has been obſerved that the extra expence makes againſt its becoming generally uſeful from the great price of oil, and the expence of the carriage of ſea ſand and droſs ſalt, in moſt inland ſituations. See OIL-*Compoſt*.

OIL-*Paint*, in *Rural Economy*, that ſort of paint which is compoſed of oil, and the oxyd of lead, or ſome other ſimilar ſubſtance, to form its baſis, or give it a body, and which is uſed for various farm purpoſes.

But the great expence of paints of this ſort has led lately to the introduction of many other materials, for the protection of wood work, and boarding of different kinds, ſuch as preparations from foſſil coal, &c. But a great objection to all theſe ſubſtances, beſides their expence, is the highly diſagreeable ſmell that they afford, and their liability to crack and bliſter.

In caſes where oil painting cannot be had recourſe to, either becauſe it does not dry ſoon enough, and has an inſupportable ſmell, or becauſe it is too dear; the following method has been employed by Mr. Ludicke for painting ceilings, gates, doors, and even furniture, with great ſucceſs: it is thus prepared, take freſh curds, and bruiſe the lumps on a grinding-ſtone, or in an earthen pan, or mortar, with a ſpatula. After this put them in a pot with an equal quantity of lime, well quenched, and become thick enough to be kneaded; ſtir this mixture well without adding water, and a white coloured fluid will ſoon be obtained, which may be applied with as much facility as varniſh, and which dries very ſpeedily. It muſt, however, be employed the ſame day, as it will become too thick the next day. And with this ochre, armenian bole, and all colours which hold with lime, may be mixed according to the colour which is wiſhed to be given to the wood; but care muſt be taken that the addition of colour made to the firſt mixture of curds and lime contain very little water, otherwiſe the painting will be leſs durable.

In performing the work, after two coats of this paint have been applied, it may be poliſhed with a piece of woollen cloth, or other proper ſubſtance, and will become as bright as varniſh.

It is aſſerted that this paint, beſides being cheap, has other advantages; in the ſame day two coats may be laid on and poliſhed, as it dries ſpeedily, and has no ſmell. If it be required to give it more durability in places expoſed to moiſture, it may be done after it has been poliſhed with the white of an egg; which is ſaid to render it as durable as the beſt oil painting that can be employed. And another ſubſtitute that may be uſed for painting weather boarding is prepared by taking three parts air-ſlaked lime, two of wood-aſhes, and one of fine ſand or ſea-coal aſhes, ſifting them through a fine ſieve, and then adding as much linſeed oil as will bring it to a conſiſtence for working with a painting bruſh: great care muſt be taken to mix it perfectly. It is impenetrable to water, and the ſun hardens it, and renders it a great preſerver of the wood.

Another compoſition has likewiſe been made uſe of with great benefit to paint boards, &c. which is made in this way. Melt twelve ounces of roſin in an iron pot, adding three gallons of train oil, and three or four rolls of brimſtone; when melted thin, as much Spaniſh brown ochre firſt ground fine with as much of the oil as will give the colour, ſhould be added; it ſhould be laid on with a bruſh as hot and as thin as poſſible, and ſome days after the firſt coat is dry another applied. It will preſerve planks for a very great length of time, as well as other ſubſtances.

The kinds of oils, their properties, manners of expreſſion, &c. are numerous: for the generality of them, the reader is referred to the proper articles.

Such as could not be more conveniently inſerted, are as follow.

OIL *of the Almond*, in the *Materia Medica*, is obtained either from the ſweet or the bitter almond, that from the one or the other being equally free from bitterneſs. The almonds are put into a coarſe hempen or hair ſack, and ſhaken violently, in order to detach, by friction with one another and againſt the ſides of the ſack, the outer-brown ſkin, which is apt to give a bitter taſte to the oil: they are then bruiſed and made into a paſte, and preſſed in the uſual manner. The London college directs the almonds to be macerated in cold water for 12 hours, and then bruiſed; and the oil is afterwards to be expreſſed without heat. The Edinburgh college orders any quantity of almonds to be bruiſed in a ſtone-mortar, and then put into a hempen ſack; the oil is to be expreſſed without heat. The Dublin college prepares this oil by bruiſing the freſh almonds in a mortar, and expreſſing it by a preſs, without heat. Sixteen ounces of almonds yield about five ounces of a bland inodorous oil, of a very ſlightly ſweetiſh taſte, which is at firſt turbid, but ſoon becomes clear. About ℥iii more may be obtained by impregnating the marc with the ſteam of boiling water. The colour of this oil is very pale greeniſh-yellow, and its ſpecific gravity .932, Fabroni; .917, Aikin. The degree at which it congeals is variouſly ſtated at 19° Fahr. and 8° Fahr. It is ſaid that the oil from the bitter almond keeps longer without growing rancid than that from the ſweet almond. This oil is demulcent and emollient, and uſed in coughs and other pulmonary complaints united with water by means of mucilage, or the yolk of egg and ſugar. A mixture of f. ℥iv of almond oil, ♏ viii of acetate of lead, forms an uſeful injection at the commencement of gonorrhœa. The doſe of the oil is from f. ℥iv to f ℥j. See ALMOND.

OIL *of Amber* of the London college is obtained by putting the amber into an alembic, and diſtilling from a ſand-bath, with a fire gradually raiſed, an acid liquor, the oil, and a ſalt impregnated with the oil; then re-diſtilling the oil twice.

The *purified* oil of amber of the Edinb. diſpenſatory is had by diſtilling oil of amber, mixed with ſix times its weight of water, from a glaſs retort, until two-thirds of the water have paſſed into the receiver; then ſeparating this purified volatile oil from the water, and keeping it in well ſtopped veſſels.

The *rectified* oil of amber of the Dublin pharmacopeia is prepared by taking a pound of the oil which comes over in the preparation of ſuccinic acid, and ſix pints of water, and diſtilling

diſtilling until two-thirds of the water have paſſed into the receiver, and ſeparating the oil. This oil is of a dark colour, thick conſiſtence, and fœtid odour; but by ſucceſſive diſtillations, it is rendered thinner, of a lighter colour, and at length nearly limpid. Rectified oil of amber has a ſtrong ungrateful odour, and a hot acrid taſte. It is light, volatile, and inflammable, inſoluble in water, and only partially ſoluble in alcohol. As to its medical properties, it is ſtimulant, antiſpaſmodic, and rubefacient. It has been found ſerviceable in deficient menſtruation, and in hyſteria, epilepſy, and ſome other convulſive affections; but it is now ſcarcely ever uſed as an internal remedy. The doſe may be from ℥ v to ℥ xij, combined by means of mucilage with any diſtilled water. It is more generally employed as a rubefacient in rheumatiſm and paralyſis; and a mixture of f.℥j of this oil with f.℥ſs of tincture of opium, has been found beneficial as a friction to the affected part in tic douloureux; and in hooping-cough, rubbed upon the cheſt two or three times a day. The officinal preparation is the Spiritus *Ammoniæ Succinatus* of the London college. See Amber and Succinic *Acid*.

Oils, *Animal*, in general, are thoſe that are obtained from animal ſubſtances, either in the ſtate of butter and fat, uncombined with the other principles of animal matters; of which kind are fat, marrow, the expreſſed oils of yolks of eggs, ſpermaceti, &c. Or, in a ſtate of combination, afforded by diſtillation of the gelatinous ſubſtance, which forms almoſt entirely all the parts compoſing animal bodies, as fleſh, tendons, nerves, cartilages, bones, horns, hair, &c. See Oil, *ſupra*.

Oil, *Animal*, *Oleum Animale*, in a more reſtricted ſenſe, the name of an eſſential oil diſtilled by a retort from blood, and formerly recommended as a powerful internal remedy in epilepſies, the gout, and other obſtinate diſeaſes.

It was originally uſed in Germany in theſe intentions. As an external, it may probably be of good ſervice in removing fixed pains, hard tumours, &c. for it is extremely penetrating.

Oil, *Volatile*, *Animal*, or *Dippel's oil*. (See Dippel's *Oil*.) If albumen or gluten be diſtilled at a dry heat, there ariſes, together with the ammonia and carburetted hydrogen, a quantity of fœtid black oil, which was the ſubject of various experiments, firſt by Dippel, a chemiſt of Berlin, and afterwards by Rouelle. From the concurrent labours of the enquirers, it appears that if this oil is rectified by three ſucceſſive diſtillations from the ſurface of water, it becomes at length quite colourleſs and tranſparent; its odour is powerful, but ſomewhat aromatic, and it is nearly as light and volatile as ether. It contains a little ammonia, and hence changes the colour of ſyrup of violets green; it is ſparingly ſoluble in water, and largely ſo in oils, ether, and alcohols. It combines both with acids and alkalies into imperfect ſoaps; it is very inflammable, and, like the vegetable eſſential oils, may be ſet on fire by ſtrong nitrous acid. If expoſed even to the light, it is partly decompoſed, loſing its tranſparency, and becoming of a brown colour. It was formerly employed in medicine; but is now wholly diſuſed. Aikin's Dict.

Oil *of Aniſe-ſeed*. (See Anise-seed.) This oil is given as a carminative, and for relieving flatulence in children, from ℥ v to ℥ xv triturated with ſugar. The officinal preparations are tinctura opii ammoniata of the Edinburgh college, and tinctura opii camphorata of the Dublin college. See Tincture.

Oil *of Antimony*, a name given to the butter of antimony, and ſome other ſolutions of antimony by acids. See Antimony.

Oil *of Arſenic*. See Arsenic.

Oil *of Aſpic*, or *Spike*. See Spike.

Oil *of Balm*. See Balsam and Melissa.

Oil *of Bays* is an eſſential oil, obtained from the berries of the bay, or Laurus *Nobilis*. Theſe berries give out to the preſs an almoſt inſipid fluid oil; and on being boiled in water, a thicker butyraceous one, of a yellowiſh-green colour, impregnated with the flavour of the berry. The berries and leaves of the bay are accounted ſtomachic, carminative, and uterine: with this view, infuſions of the leaves are drank as tea, and the eſſential oil of the berries is given on ſugar, or diſſolved by means of mucilages, or in ſpirit of wine, from one to five or ſix drops. But the principal uſe of theſe ſimples in the preſent practice is external: they are made ingredients in carminative glyſters, warm cataplaſms, and uterine baths; and the butyraceous oil of the berries ſerves as a baſis for ſome nervine liniments, and mercurial and ſulphureous unguents. Lewis. See Daphnelæon.

Oil *of Beech*, See Beech-*oil*.

Oil *of Been*, or *Ben*. See Ben.

Oil, *Birch*, a vegetable empyreumatic oil, prepared in Ruſſia, by charring birch-wood in a cloſe oven, the watery acid and oil being collected in a large receiver; and the latter product being the lighteſt, is ſkimmed off from the ſurface of the water. This oil has a peculiar ſcent, and is ſaid to drive away worms and other inſects; on which account it is uſed in the dreſſing of Ruſſia leather, to which it communicates thoſe properties that render it ſo much eſteemed by the binders of books.

Oil, *Britiſh*, an empirical medicine of the ſame nature with the petrolea; the genuine ſort being extracted by diſtillation from a hard bitumen, or a kind of ſtone-coal, found in Shropſhire, and other parts of England. Lewis.

Oil, or *Butter*, of *Cacao*. See Cocos.

Oil, *Cajeput*. See Cajeput and Melaleuca.

Oil *of Camphor*. See Camphor and Laurus.

Oil *of Caraway*. (See Carua.) Six pounds of caraway-ſeeds yield 4½ ounces of oil, which has an aromatic odour, and a ſweetiſh pungent taſte; it is viſcid, and of a yellow colour; its ſpecific gravity is .946. This oil, which is ſtimulant and carminative, is chiefly uſed as an adjunct to purgative pills, and for covering the diſagreeable flavour of other ſubſtances. The doſe is from ℥ j to ℥ x. The officinal preparations are electuarium ſennæ, confectio ſcammonii, pilulæ aloes comp., and pilulæ aloes, cum myrrha.

Oil *of Caſtor*. See Castor and Ricinus.

Oil, *Cardamom*. See Cardamom.

Oil, *Cauſtic*. See Arsenic.

Oil *of Chamomile*, an oil diſtilled from anthemis or chamomile. Its odour is unpleaſant, and its taſte pungent. When recently diſtilled, its colour is a cerulean blue, which changes by age to a deep yellow. Eighty-two pounds of chamomile-flowers yield 18 drams of oil. This oil is ſuppoſed to poſſeſs antiſpaſmodic powers, and is therefore ſometimes recommended in cramp of the ſtomach, and as an adjunct to purgative pills. The doſe is from ℥ v to ℥ x, but it is ſeldom uſed. See Anthemis.

Oil *of Cinnamon*. See Cinnamon.

Oil *of Cloves*. See Caryophyllus.

Oil *of Cole-Seed*. See Cole-*Seed*.

This oil, and alſo thoſe of muſtard-ſeed, rape-ſeed, and ſunflower-ſeed, are leſs coloured and leſs highly flavoured than thoſe of linſeed and hemp-ſeed. They are very little liable to dry by expoſure to the air; and theſe circumſtances, together with their moderate price, induce a large conſumption of them by the wool-dreſſers, in order to preſerve

ſerve the wool from the attacks of moths and other inſects; and alſo by the leather-dreſſers.

Oil, *Connecting*, a term uſed by Boerhaave, and his followers, to expreſs a certain oil, found in all vegetable ſubſtances, but wholly different from, and independent of, their eſſential oil. This is not poſſeſſed of any of their virtues or qualities, but ſeems the ſame in all plants, and is the means of their conſiſtence and ſolidity, giving tenacity to their earth, which, without it, falls to duſt, and the plant exiſts no more.

This oil is not ſeparable by boiling water, as the eſſential oil is, but only by fire: when a plant has been boiled and diſtilled, its eſſential oil, ſalt, &c. are all carried off, and what remains is only the earth corrected by this oil. This being expoſed to the fire, the oil diſcovers itſelf in a thick, black, ſtinking ſmoak, and, finally, taking fire, it burns away, and leaves only the earth, which was the baſis of the plant; retaining its form, indeed, if the proceſs has been carefully made, but falling into a ſhapeleſs powder only on being roughly breathed upon.

This great author, therefore, eſtabliſhes it as a rule, that there are three ſorts of oil in plants. 1. An oily froth. 2. The eſſential oil, diſſolved in decoction. And, 3. This connecting, or conſolidating oil, ſeparable only by a naked fire.

Oil, *Cornel*, a fixed oil reſembling olive oil, by being contained, not in the ſeed, but in the pulpy fruit of the vegetable. The berries of this ſhrub (Cornus *Sanguinea*) being collected when quite ripe, and laid in heaps for a few days to mellow, are to be reduced to a pulp, and preſſed without heat in the uſual manner. By this treatment, from 22lbs. avoirdupois may be obtained ſomewhat more than four wine pints of a fat, ſomewhat viſcid, oil, of a bright green colour, and equally deſtitute of any unpleaſant flavour as the beſt olive oil. When heated with nitric acid, it is converted to a brown-yellow butter or wax. By boiling with litharge, it becomes drying; when ſpread thin on water, and expoſed to the air for a month, it is converted into a white wax. It does not freeze ſo readily as olive oil, and laſts rather longer than this when uſed in a lamp. Aikin's Dict.

Oil *of Cumin*. See Cuminum.

Oil *of Dill*. See Anethum.

Oils, *Drying*. See Oil, *ſupra*.

Drying oils are formed of linſeed oil, prepared by means of boiling, ſometimes with and ſometimes without the addition of other ſubſtances. Thoſe commonly added to oil, in this preparation, are white vitriol, ſugar of lead, ſeed-lac, gum maſtic, gum ſandarac, gum anime, gum copal, umbre, colcothar, litharge, and red-lead. A drying oil for the nicer works may be prepared by boiling two ounces of gum ſandarac, white vitriol, and ſugar of lead, of each one ounce, in a pint of nut or poppy oil, till the ſolid ingredients be diſſolved, and the mixture becomes of the colour of linſeed oil. For coarſer work, take one gallon of linſeed oil, one pound of litharge of gold or ſilver, half a pound of white vitriol, and ſugar of lead, gum arabic, and umbre, of each a quarter of a pound; boil them as long as the diſcolouring of the oil, which is the gradual conſequence of boiling, will allow. That made for ſale is prepared by boiling one gallon of linſeed oil, and one pound and a half of red-lead, as long as the colour will bear it. When the calxes of lead are united in ſmall quantity with oil, they diminiſh its fluidity, and diſpoſe it to dry more readily. Theſe oils are much uſed in painting, on account of their drying quality. When a large quantity of calxes of lead is combined with oil, they form with it a ſolid, opaque, and tenacious body, capable of ſoftening by heat. Theſe combinations are uſeful in pharmacy, for giving a convenient conſiſtence and tenacity to many plaſters.

Oils, *Diſtilled*, are the volatile oils, ſo called in the London pharmacopeia. For preparing them, they direct that the ſeeds of aniſe and caraway, the flowers of chamomile and lavender, the berries of juniper and all-ſpice, the tops of roſemary, and the entire plants of the other articles, dried, are to be employed. Any one of theſe is put into an alembic, and as much water poured in as will cover it; and then the oil is diſtilled into a large refrigeratory. The water which diſtils over with the oils of pepper-mint, ſpear-mint, all-ſpice, and penny-royal, is to be preſerved for uſe.

Oil *of the Earth*, *Oleum Terræ*, in the *Materia Medica*, the name of a thick mineral fluid of a duſky browniſh-black, with a faint caſt of purple, and of the conſiſtence of a thin ſyrup, very little tranſparent, and of a ſtrong penetrating ſmell, like that of common oil of amber. It oozes out of the cracks of rocks, in ſeveral parts of the iſland of Sumatra, and ſome other parts of the Eaſt Indies, and is much eſteemed there in paralytic diſorders; but it is ſeldom imported into England; what our Eaſt India ſurgeons and captains uſually bring over under this name being only a vegetable oil, impregnated with the virtues of certain of their foſſils by boiling. See Petrol.

Oil, *Empyreumatic*. See Oil, *ſupra*, and Empyreuma.

Oils, *Eſſential*, are thoſe which have evidently the ſmell of the vegetable from which they are obtained. All theſe oils are ſufficiently volatile to riſe with the heat of boiling water; and this degree of volatility is one of their ſpecific characters. See Oil, *ſupra*.

The oils of plants have not always the ſame taſtes with the plant they are diſtilled from, or, at leaſt, not in the ſame degree. Nothing is more bitter than wormwood, yet the oil of wormwood has no remarkable bitterneſs. Aniſe, which is of a ſweet taſte, yields, on the contrary, an oil infinitely more ſweet than the ſeed; and pepper, which is ſo remarkably hot and acrid, affords an oil no way remarkable for its pungency. Thyme, which is in itſelf very acrid and pungent, conveys that property, in a yet greater degree, to its oil; there is, indeed, no eſſential oil ſo acrid and fiery as that of this plant. The fetid oils drawn in dry diſtillation by the retort, in an open fire, no way differ from theſe but by the damage the fire has done them, and may always be converted into theſe by repeated diſtillations. Nay, the very fat oils, ſuch as that of almonds, may be attenuated ſo far as to become as fine, and as ſubtile, as the eſſential oils. This is to be done by means of quick-lime; and ſeveral repeated diſtillations of this oil, or any other of a like kind, with freſh lime to every diſtillation, will reduce it to be volatile, penetrating, and capable of being raiſed, and diſtilled, by means of water, which is the greateſt teſt of the eſſential oils. The bituminous and fetid oils may alſo, in the ſame manner, be reduced, by repeated diſtillations, to the ſtate of the eſſential ones, and to be equally fluid and limpid, and equally penetrating. Memoirs Acad. Par. 1721.

The eſſential oils of vegetables may be divided into two claſſes, according to their different ſpecific gravities, ſome floating upon water, and others readily ſinking to the bottom thereof. Thus the eſſential oils of cloves, cinnamon, and ſaſſafras, readily ſink; but the oils of lavender, marjoram, mint, &c. ſwim upon the water. The lighteſt of all the eſſential oils is, perhaps, that of citron peels, which even floats on ſpirit of wine; and the heavieſt of them ſeems to be the oil of ſaſſafras.

For the obtaining the full quantity of the more ponderous oils

oils from cinnamon, cloves, ſaſſafras, &c. it is proper 1. To reduce the ſubjects to fine powder. 2. To digeſt this powder for ſome days in a warm place, with thrice its quantity of ſoft river water, made very ſaline with the addition of ſea-ſalt, or ſharp with oil of vitriol. 3. To uſe the decoction left in the ſtill, inſtead of common water, for a freſh digeſtion. 4. To uſe alſo, for the ſame purpoſe, the water of the ſecond running, after it has been cleared of its oil. 5. Not to diſtil from too large a quantity of the ſubject at once. 6. To leave a conſiderable part of the ſtill empty. 7. To uſe a briſk fire, or a ſtrong boiling heat at firſt, but to ſlacken it a little afterwards. 8. To have a low ſtill head, with a proper internal lodge, and current, leading to the noſe of the worm. And, 9. To cohobate the water, or pour it back upon the matter in the ſtill, after ſeparating its oil, and repeating this once or twice more.

The vegetable world affords vaſt variety of eſſential oils, moſt of them very odorous, and of great virtues; but different vegetables yield oils of different conſiſtence, and in different quantities.

Theſe oils are employed in painting, in ſpirituous liquors uſed at the table and at the toilette, in perfumes, and in medicine. As they act very powerfully, ſmall doſes, as from one drop to four or five, incorporated with ſugar, muſt be given internally. They are recommended as cephalic and antiſpaſmodic, in convulſive and hyſterical affections: they are alſo ſtimulant, ſudorific, and ſtrengthening. All drugs which are alexipharmic, cephalic, tonic, and ſtomachic, containing vegetable aromatic, derive their virtues from the eſſential oils of theſe vegetables. The ſame may be ſaid of all medicinal, aromatic, and ſpirituous waters. In ſome caſes, eſſential oils are employed externally as ſtrengtheners, and to allay painful ſpaſms of nervous and tendinous parts, to reſolve and diſſipate acrid humours, which occaſion pain, without any ſenſible inflammation; but they muſt not, on account of their cauſtic quality, be uſed alone, but formed into liniments or pomatums, by mixing them with a ſufficient quantity of fat, or fat oils. When applied to the human body, they ſtimulate, corrode, and reſiſt putrefaction; and mixed with the blood, raiſe ſome degree of fever. Med. Eſſ. Edinb. vol. v. art. 24. See *Volatile* OILS, *infra*.

As many of the eſſential oils are dear, it is a very common practice to adulterate, or debaſe them ſeveral ways, ſo as to render them cheaper both to the ſeller and the buyer. Theſe ſeveral ways ſeem reducible to three general kinds, each of which has its proper method of detection. Theſe three ways are, 1. To adulterate them with expreſſed oils. 2. With alcohol. And, 3. With cheaper eſſential oils.

If any eſſential oil be adulterated with expreſſed oil, it is eaſy to diſcover the fraud by adding a little ſpirit of wine to a few drops of the ſuſpected eſſential oil, and ſhaking them together; for the ſpirit will diſſolve all the oil that is eſſential, or procured by diſtillation, and leave all the expreſſed oil that was mixed with it untouched.

If an eſſential oil be adulterated with alcohol, or rectified ſpirit of wine, it may be done in any proportion, up to that of an equal quantity, without being eaſily diſcoverable either by the ſmell, or taſte. The way to diſcover this fraud is to drop a few drops of the oil into a glaſs of fair water; and if the oil be adulterated with ſpirit, the water will immediately turn milky, and by continuing to ſhake the glaſs, the whole quantity of ſpirit will be abſorbed by the water, and leave the oil pure at top.

Finally, if an eſſential oil be adulterated by a cheaper eſſential oil, this is commonly done very artfully: the method is to put fir-wood, turpentine, or oil of turpentine, into the ſtill, along with the herbs to be diſtilled for their oil, ſuch as roſemary, lavender, origanum, &c.; and, by this means, the oil of turpentine diſtilled from theſe ingredients comes over in great quantity, and is intimately blended with the oil of the genuine ingredient. The oils thus adulterated always diſcover themſelves in time, by their own flavour being overpowered by the turpentine ſmell; but the ready way to detect the fraud is to drench a piece of rag, or paper, in the oil, and hold it before the fire; for thus the grateful flavour of the plant will fly off, and leave the naked turpentine ſcent behind. Shaw's Lectures, p. 145.

The eſſential oils, as volatile oils are called by the Dublin college, are prepared in the following manner: let the oil be extracted by diſtillation from the ſubſtance previouſly macerated in water, as much water being added during the diſtillation as may be ſufficient to prevent empyreuma. In diſtilling fennel, pepper-mint, ſpear-mint, penny-royal, and all-ſpice, the watery fluid that comes over in diſtillation with the oil is to be preſerved for uſe.

OIL *of Fennel Seeds*. (See ANETHUM *Fœniculum*.) Seventy-five pounds of fennel ſeeds yield thirty ounces of oil, which is colourleſs, and congeals at 50°. It has the odour of the plant and a ſweet taſte. The ſpecific gravity is .997. The medical properties and uſe are the ſame with thoſe of the plant. The uſual doſe is from ℥ ij to ℥ xx; but it is rarely uſed.

OIL, *Fern*. See FERN.

OIL, *Granulated*, is that fixed in little grains; this is the beſt, and moſt eſteemed, eſpecially of oils of olives.

OIL, *Green*, *Oleum Viride*, a form of medicine preſcribed in the late London pharmacopeia, and made in the following manner: take leaves of bay, rue, marjoram, ſea-wormwood, and chamomile, each three ounces; oil of olives, a quart. Boil the herbs in the oil till they are criſp, and then ſtrain off the oil; and when it has ſtood for the fæces to ſubſide, put it up for uſe.

OIL *of Hartſhorn, Rectified*, is prepared by the Dublin college in the following manner. Take of the oil which riſes in the diſtillation of the volatile liquor of hartſhorn, three pounds, and ſix pints of water. Diſtil the oil, then remix it with the water, and rediſtil, repeating the diſtillations until the oil becomes limpid. This oil ſhould be kept in a dark place, in ſmall phials completely filled and cloſely ſtopped.

This empyreumatic oil is firſt formed by the decompoſition of animal matter by heat; and ariſes from a new combination of part of the hydrogen and carbon of the ſubſtance diſtilled. When firſt obtained, it is thick, of a dark colour, and has a very offenſive odour; but by the rectification preſcribed, it is rendered thinner and leſs offenſive. The rectified oil is nearly colourleſs and tranſparent; it has a ſtrong, ſlightly aromatic odour, and a penetrating taſte. It is very light and volatile, ſtrikes a green colour with ſyrup of violets, is partially ſoluble in water, and unites readily with alcohol, ether, and oils. The acids form with it a thick ſaponaceous compound; and with the alkalies it forms a fine ſoap. Expoſure to light and air deſtroys its tranſparency, and gives it a deep brown colour. As to its medical properties and uſes, this oil is ſtimulant, antiſpaſmodic, anodyne, and ſudorific. It was formerly regarded as a remedy of much efficacy in fever, adminiſtered a few hours before the acceſſion of the paroxyſm of intermittents; and was alſo much employed in epilepſy, hyſteria, and all convulſive affections: but it is now almoſt diſcarded from practice, being only uſed occaſionally as an external application to paralytic limbs. The doſe may be from ℥ x to ℥ xxx, in a ſufficient quantity of water. Thomſon's Lond. Diſp.

OIL,

Oil, *Hempſeed*, is of a green colour, and ſtrongly impregnated with the peculiar colour of this plant. The proportion of oil which hemp-ſeed affords is from 20 to 25 *per cent.* In its general properties, uſes, and mode of preparation, it very much reſembles linſeed oil; which ſee.

Oils, *Inflammability of.* See Oil, *ſupra.*

Oil *of Juniper*, or *of Juniper Berries.* (See Juniperus.) Forty-eight pounds of berries yield ſix ounces of oil, of a ſpecific gravity .611. In odour it reſembles turpentine, and its taſte is hot and acrid. It has a greeniſh-yellow colour, is viſcid, and depoſits a fæculent matter when long kept. When genuine it is ſoluble in alcohol. This oil is carminative, diaphoretic, and diuretic. It is ſometimes given in dropſy, and may be added to fox-glove, when it is exhibited in form of pills. The doſe is from ♏ ij to ♏ x, combined with water by means of ſugar or mucilage.

Oil *of Lavender.* (See Lavandula.) One pound and nine ounces of this oil are obtained from eighty pounds of lavender flowers. Its odour is very fragrant, and taſte warm and agreeable; its colour is a pale lemon-yellow, and ſpecific gravity .936. It is ſtimulant and cordial; and is chiefly uſed in hyſteria and nervous head-ache, in doſes from ♏ j to ♏ v, given on a lump of ſugar. Its officinal preparation is unguentum ſulphuris of the Edin. pharmacopeia.

Oil *of Lead*, is a ſolution of ſalt of lead in the eſſential oil of turpentine. This preparation is a powerful antiſeptic.

Oil *of Lemon*, called the eſſence of lemon. (See Lemon.) This eſſential oil is chiefly uſed as a perfume to cover the ſmell of ſulphur in ointments compounded with it. Its officinal preparations are ſpiritus ammoniæ aromaticus, unguentum ſulphuris, and unguentum veratri.

Oil *of Linſeed.* (See Linseed.) The ſeeds of the common flax, conſiſting of a white kernel covered with a thin browniſh ſhell, which cannot be ſeparated from it, are ſubmitted entire to the preſs; but if they are thus treated without any previous preparation, they yield a comparatively ſmall quantity of oil, on account of a ſtrong mucilage that reſides in the ſhell, and abſorbs a large proportion of the oil as it is forced out of the kernel. For this reaſon, and alſo becauſe the cold-drawn oil is not ſo fit for the purpoſes to which this oil is generally applied, the mucilage is deſtroyed before the application of the preſs by the following method. An iron-veſſel, like a ſand-bath, and capable of containing ſome buſhels, is fixed in a furnace; it is then filled with linſeed, and heated by a moderate fire, the contents being carefully ſtirred from time to time, that every part may be equally roaſted: at firſt there ariſes an abundance of aqueous vapour, which, as the heat is increaſed, is followed by denſe blackiſh fumes of a very nauſeous odour. When the torrefaction is completed, the paſte is preſſed in the mill in the uſual way. The proportion of oil yielded by this trial is about 20 *per cent.*; its ſpecific gravity is .9403: it is not congealed except by a cold below 0° Fahr., and its point of ebullition is about 600° of the ſame thermometer. The cold-drawn oil has a high yellow colour, is very unctuous and unpleaſant both to the taſte and ſmell: by expoſure to the air and light it becomes dry. The hot-drawn oil is of a high yellowiſh-red, or deep wine colour, and is more nauſeous than the former: it is of a thicker conſiſtence, and dries without much difficulty in the air, more eſpecially if it has been boiled with a little litharge. The great demand for this oil is in the coarſer kinds of painting, particularly ſuch as is not much expoſed to the weather, as floor-cloths, &c. In medicine it is conſidered as emollient, demulcent, and ſlightly laxative; but as an internal remedy it is ſeldom uſed, on account of its nauſeous taſte; though it has been given with advantage in ileus, when purgatives have failed. It is chiefly employed in the form of a glyſter, in flatulent colic attended with coſtiveneſs, and in abraſions of the rectum; and it is an uſeful application to burns, eſpecially when combined with lime-water. The doſe, when taken by the mouth, is from f.ʒſs f.ʒj; but from f.ʒiij to f.ʒvj may be given at once, per anum. The officinal preparation is the linimentum aquæ calcis of the Edinburgh pharmacopeia, formed by mixing equal parts of linſeed oil and lime-water. Aikin. Thomſon.

Oil *of Mace.* See Mace and Nutmeg.

Oil *of Marjoram.* See Marjoram.

Oil, *Medullary.* See Medullary *Syſtem.*

Oil *of Mercury*, a ſolution of corroſive ſublimate in ſpirit of urine. See Mercury.

Oil *of Mint.* See Mentha.

Oil *of Muſtard.* See *Hedge* Mustard, and Sinapis.

Oil *of Myrrh.* See Myrrh.

Oil *of Nut.* (See Nut-*Oil.*) As the walnut and hazel-nut from which this oil is obtained, chiefly by cold-drawing, come to their full perfection in the warm climate of the ſouth of Europe, they will yield, by proper management, full half their weight of oil. Recent cold-drawn nut-oil is preferred by many to olive-oil, on account of its retaining the exquiſite flavour of the nut; the hot-drawn has an empyreumatic taſte, and is no longer fit for the table: it is, however, much valued by the painter, as being eminently drying, much leſs coloured than linſeed oil, and capable of bearing the injuries of the weather better than any other oil.

Oil *of Nutmeg.* See Nutmeg.

Oil *of Olives* is the moſt popular, and moſt univerſal of all other; being that chiefly uſed in medicine, in foods, ſallads, and in the manufactures.

It is drawn from olives by preſſes or mills made for the purpoſe. The fruit is gathered when at its utmoſt maturity, in November, as it begins to redden: being put under the mill, as ſoon as gathered, care is taken that the mill-ſtones are ſet at ſuch a diſtance that they may not cruſh the nut of the olive. The fleſhy pulp, covering the nut or ſtone, and containing the oil in its cells, being thus prepared, is put into bags made of ruſhes, and moderately preſſed; and thus is obtained a conſiderable quantity of a greeniſh ſemi-tranſparent oil, which, from its ſuperior excellence, is called Virgin oil. The marc remaining after the firſt preſſure is broken to pieces, moiſtened with water, and returned to the preſs, upon which there flows out a mixture of oil and water, which ſpontaneouſly ſeparate by reſt. This oil, though inferior to the former, is of a good quality, and fit for the table. The marc, being again broken to pieces, well ſoaked in water, and fermented in large ciſterns, is again ſubmitted to the preſs, by which is obtained a very conſiderable quantity of a third kind of oil, that is very valuable to the ſoap-boiler and other manufacturers. In ſome countries, particularly in Spain, the olives, inſtead of being gathered by hand, are beaten down, ſo that the ripe and unripe ones are mixed together, and to theſe are added ſuch as have fallen of themſelves, and are therefore more or leſs decayed. All theſe are thrown together in a heap, which ſoon ferments: the olives in this ſtate are ground and preſſed, and thus is procured with leſs trouble a large quantity of oil, of a rank diſagreeable flavour, which none can bear but ſuch as have been accuſtomed to it from their childhood. Recently-drawn Virgin oil has a bland almoſt mucilaginous taſte, with a ſlight but

agreeable flavour: when expoſed to the air, in an open bottle or caſk, a white fibrous albuminous matter is depoſited, and the ſupernatant oil becomes clear and of a dilute yellow colour: and when this oil is poured off into another veſſel, a ſecond depoſition occurs, and then the oil obtained, being put into clear glaſs phials, may be kept for a conſiderable time, without undergoing any change. But if the oil be allowed to ſtand on the white matter, it becomes in a few weeks very rancid; nor can the common oil, even under proper management, be preſerved in caſks longer than a year and a half, or two years at the fartheſt. The ſpecific gravity of olive-oil is .9153; it boils at about 500° Fahrenheit, and congeals at 36° or 38° Fahrenheit. The facility with which it freezes renders it improper for lamps, eſpecially in cold countries; but by previouſly expoſing it in an open clear glaſs phial to the ſun-ſhine, it may be ſo far amended in this reſpect, as to continue fluid at 21° Fahrenheit. Olive-oil is often ſophiſticated by a mixture of poppy oil, which renders it drying, a quality which the genuine oil does not poſſeſs. In countries that produce it, it is uſed for food, as butter is with us: that of the inferior kinds is burnt in lamps, or employed in the manufacture of ſoaps, which are of a finer quality than thoſe that are compoſed of animal oils. The beſt oil is made in Provence; but that which we receive in this country is brought from Lucca and Florence. It is imported in jars, half-jars, and half-cheſts, which are wooden packages containing flaſks.

Olive-oil is uſed in medicine, internally, as a demulcent in catarrh and other pulmonary affections, diffuſed in water by means of mucilage; and it is alſo given, in large quantities, to mitigate the action of acrid ſubſtances, as ſome poiſons, taken into the ſtomach; and in caſes of worms, applied externally it is a very uſeful relaxant, and inſtead of ſtopping up the cutaneous exhalants, appears to promote the excretion of ſweat, on which account it is beneficially employed in frictions at the commencement of the plague. The body is ordered to be very briſkly rubbed all over with a clean ſponge dipped in warm olive-oil, and the operation is repeated once a day until ſymptoms of recovery appear. Mr. Jackſon relates, that the coolies, who are employed in the oil-ſtores at Tunis, ſmear themſelves all over with oil, and are ſeldom afflicted with the plague when it rages in that city. Frictions with it are uſeful in aſcites. It is alſo uſed as an injection in gonorrhœa; as an adjunct to glyſters in dyſentery and inteſtinal abraſions; and extenſively in pharmacy, in the compoſitions of ointments and plaſters.

The doſe of olive oil is from f.ʒſs to f.ʒj, triturated with mucilage, or mixed with water by means of a few drops of ſolution of potaſs. In caſes of poiſons and worms, as much may be given as the ſtomach can bear. The officinal preparations of oil, beſides cerates and ointments, are Oleum ſulphuratum, L. E. Linimentum ammoniæ fortius, L. E. D. Linim. ammoniæ carbonatis, L. Linim. calcis, D. Linim. camphoræ, L. E. D. Emplaſtrum plumbi, L. E. D. Emp. hydrargyri, E. Emp. oxidi rubri ferri, E. Enema catharticum, D.

For the "oleum ſulphuratum," ſee preparations of SULPHUR. For the liniments, ſee LINIMENT. For the plaſters, ſee EMPLASTRUM and PLASTER. Aikin. Thomſon.

OIL *of Orange-peel.* See AURANTII *Cortex.*

OIL *of Origanum.* See MARJORAM.

OIL, *Palm*, or *Oil of Senegal*, a thick unctuous liquor, of a yellow colour, and a violet ſmell; ſo called, becauſe drawn, by ebullition, or by expreſſion, from the fruit of a kind of palm-tree, growing in ſeveral places of Africa, eſpecially in Senegal.

Many of the palms produce nuts, which abound in oil. The principal of theſe are the Cocos *Butyracea*, and ELÆIS *guineenſis*. The ripe fruit is collected in a heap, and ſlightly fermented; it is then coarſely pounded and macerated in hot water, and thus its oil is parted with and ſwims on the ſurface of the water, which by cooling concretes into a ſolid cake. It is purified by waſhing in hot water, and thus becomes fit for uſe. It has a light brown-yellow colour, little or no taſte, but a high odour and flavour like thoſe of the Florentine iris; by long keeping it becomes rancid, and is then nearly white, and almoſt without odour.

The Africans and the Negroes in the Weſt Indies uſe this oil as we do butter; and burn it in their lamps when old. With us, it is only uſed in ſome external applications, for pains and weakneſs of the nerves, cramps, ſprains, and other ſuch complaints. The common people ſometimes apply it to chilblains; and when uſed early, not without benefit. It is alſo employed in the compoſition of the beſt yellow ſoap. It is ſometimes counterfeited with wax, oil of olives, iris, and turmeric; but the trick is found out either by air or fire. The air alters the colour of the genuine, and leaves the counterfeit unchanged; and, on the contrary, fire changes the counterfeit, but does not alter the genuine.

OIL *of Penny-royal.* (See MENTHA *Pulegium.*) This oil, which is of a reddiſh-yellow colour, reſembles in its other qualities the oil of pepper-mint. Its ſpecific gravity is .978. It is ſtimulant and antiſpaſmodic, but ſeldom uſed. The doſe may be from ℥j to ℥ v, given on a lump of ſugar.

OIL *of Jamaica Pepper.* (See PIMENTO.) This oil has the agreeable odour of the pimento, with its pungent taſte augmented. Its colour is reddiſh-brown, and it is heavier than water. It has the ſame properties with the all-ſpice, but in a greater degree: it is given in dyſpeptic affections, colic, and tympanitis, in doſes of from ℥ iij to ℥ v, rubbed with ſugar, or in any proper vehicle. Its officinal preparation is emplaſtrum aromaticum of the Dublin college. See PLASTER.

OIL *of Pepper-mint.* (See MENTHA.) This is a common domeſtic remedy in cramp of the ſtomach, flatulent colic, and anorexia; and uſually rubbed up with ſugar or mucilage. The doſe is from ℥j to ℥ iij. The officinal preparations are pilulæ thei camp. E. Pilulæ aloes cum zingibere, D.

OIL *of Petrol.* See NAPHTHA and PETROLEUM.

OIL *of Pimento.* See PIMENTO, and OIL *of Jamaica* pepper, *ſupra.*

OIL *of Black Pitch.* See PITCH.

OIL *of Poppy-ſeed*, or *Pink-oil*, is extracted by cold-drawing from the ſeeds of the large white poppy (*Papaver ſomniferum*), which is largely cultivated for this purpoſe in France, the Netherlands, and various parts of Germany. It is tranſparent and nearly colourleſs, and when well prepared, has no other taſte or flavour, than a ſlight one of nut-kernels. Its ſpecific gravity is .9288. This is one of the naturally drying oils, and like all of that claſs is frozen with difficulty; it may be cooled down to 0° of Fahr. without congealing. When employed as food, it is ſcarcely to be diſtinguiſhed from olive-oil, which is often adulterated with it. The quantity of oil yielded by a given weight of the ſeeds depends partly on the country and ſeaſon in which the ſeeds are produced, and partly on the mode of extracting the oil. From 100lbs. of freſh ſeeds, ſome ſtate the produce of oil at 25lbs., and others at 58lbs. It is uſed as an article of diet, and in the compoſition of varniſhes, but it is very unfit for burning in a lamp. See PAPAVER and POPPY.

OIL *of Rape-ſeed.* See RAPE, and OIL *of Cole-ſeed.*

OIL, *Red*, in the *Porcelain Manufacture*, a name given to a peculiar

a peculiar colour uſed on the china-ware, or to thoſe pieces of the ware which are coloured with it. It is a very elegant ornament, and would be worthy our attempting to imitate in England, on our better ſorts of wares. They do it in the following manner: they mix the red colour, called *tamlan-hum*, or the copperas red (ſee PORCELAIN) with *oil of ſtone*, and with another oil, as they expreſs it, of the ſame kind, made of a whitiſh ſort of pebble, or agate, found on the ſhores of their rivers, and the place of which might probably be ſupplied with us by common cryſtal. The powder is to be thoroughly mixed with theſe liquors, and the veſſel dipt carefully into the mixture, or ſome parts of it only covered with it in figures: after this, it is to be ſet by to dry, and, when thoroughly dried, it is to be baked in the common way. The general method is that of covering the veſſel all over, both inſide and out, with this red; and it comes out of the moſt bright and brilliant colour imaginable, but it will not ring when ſtruck upon, as our common china-ware does. We ſeldom ſee this in any degree of perfection, but it is very elegant when fine.

OIL, *Rock*. See PETROLEUM.

OIL *of Roſemary*. (See ROSEMARY.) Twenty-four pounds of the plant yield one ounce of a fluid colourleſs oil, the odour of which is leſs agreeable than that of the plant. It depoſits cryſtals of camphor when long kept. Its ſpecific gravity is .934. As to its medical properties, it is ſtimulant, and frequently enters into the compoſition of liniments. The doſe, as an internal remedy, may be from ℥ ij to ℥ vj; but it is ſcarcely ever ordered. The officinal preparations are tinctura ſaponis, and alcohol ammoniacum aromaticum.

OIL *of Rue*. (See RUTA.) Twenty-one pounds of rue yield 59 grains of oil, which has the ſtrong ungrateful odour and taſte of the plant. When recently drawn the colour is yellow, but it deepens into brown by age, and depoſits a browniſh reſinous ſediment. It congeals at 40° Fahr. Oil of rue is ſtimulant and antiſpaſmodic; it is ſometimes given in hyſteria, and the convulſive affections of children attendant on dentition; and is alſo occaſionally uſed as a rubefacient in palſy. The doſe is from ℥ ij to ℥ v, triturated with ſugar or mucilage.

OIL *of Sage*. See SAGE.

OIL *of Saſſafras*. (See SASSAFRAS.) Sixty pounds of ſaſſafras yield 12 ounces of a viſcid yellow oil, heavier than water; its ſpecific gravity being 1.094. Its odour is fragrant, and its taſte hot and acrid, excoriating the lips when incautiouſly taſted.

The oil of ſaſſafras is peculiarly liable to cryſtallization in certain circumſtances, and that into the moſt beautiful forms. Mr. Maud gives an account of a quantity of this oil, which having ſtood expoſed to the air in a very froſty night, in an open veſſel, was in the morning found changed three parts in four of it into very beautiful and large cryſtals: they were of an hexagonal form, very tranſparent, and of three or four inches in length, and half an inch in thickneſs. Theſe cryſtals ſubſided in water, and were indiſſoluble in it; they were readily inflammable at the fire, and were reduced by heat to their priſtine fluid ſtate: hence it is evident that they ſtill retain the natural qualities of an oil, though they appear under ſo very different a modification of their parts. What is moſt remarkable in this change, is, the metamorphoſis of a fluid to a ſolid body, of ſo determinate and regular a figure, and that theſe cryſtals ſhould be perfectly clear and colourleſs, though the liquor from which they froze was of a yellowiſh colour, not unlike that of Madeira wine.

This oil is ſtimulant, and ſuppoſed to be alſo ſudorific and diuretic. It has been given in chronic rheumatiſm, ſcurvy, and ſome cutaneous affections. The doſe is from ℥ ij to ℥ x, but it is ſcarcely ever ordered.

OIL *of Savine*. (See JUNIPERUS.) Two pounds of ſavine are ſaid to yield five ounces of oil, which is limpid, of a pale yellow colour, having the odour of the plant, and being very acrid to the taſte. This oil is the principle on which the virtues of ſavine depend; hence it poſſeſſes the ſame properties, and is applicable to the ſame purpoſes as the plant. The doſe may be from ℥ ij to ℥ vj, triturated with ſugar.

OIL *of Spearmint*. (See MENTHA.) The flavour of this oil is ſimilar to that of pepper-mint, but leſs grateful; its taſte is warm, and leſs pungent; its ſpecific gravity is .975, and its colour greeniſh. Its medical properties are the ſame with thoſe of oil of peppermint. The doſe is from ℥ ij to ℥ v, given on a lump of ſugar. Its officinal preparation is infuſum menthæ compoſitum, which is prepared, according to the directions of the Dublin college, by taking of the leaves of ſpearmint, dried, two drachms, and a ſufficient quantity of boiling water to afford ſix ounces by meaſure when ſtrained; digeſting for half an hour, but ſtraining the liquor when cold, then adding of refined ſugar two drachms, oil of ſpearmint, three drops diſſolved in half an ounce (fluid?) of compound tincture of cardamoms; and mixing the ingredients. This is a grateful ſtomachic, and is ſlightly diaphoretic. It may be ſerviceable in anorexia and nauſea, and as a vehicle to cover the diſagreeable taſte of other medicines. The doſe may be from f. ʒj to f. ʒiij, or at pleaſure.

OIL, *Stillatitious*. See STILLATITIOUS.

OIL *of Stone*. In the manufacture of the Chineſe porcelain, they uſe a liquid matter of a white colour, which they call by this name, on which their great myſtery of finiſhing their work depends; yet this has been leſs enquired into by the imitators of that ware in Europe than many other articles of leſs conſequence. The ſtone of which this oil is made, is of the ſame degree of hardneſs with that which the petunſe is prepared of. They procure it from quarries, and chooſe ſuch as is of a good white colour, and has many dark green ſpots in it.

Theſe ſpots are of the colour of the leaves of cypreſs. Sometimes a ſtone is choſen which has a brown ground, variegated with ſpots and blotches of a reddiſh colour. They firſt carefully waſh this ſtone; then laying it in a clean place, they break it to pieces with iron inſtruments, and afterwards grind theſe to a perfectly fine and impalpable powder, by rubbing them in large mortars, with peſtles of ſtone faced with iron, and turned either by the labourers, or by water. When the whole is thus reduced to a fine powder, they throw it into a veſſel of water; and ſtirring it briſkly about, they let the coarſer part ſubſide to the bottom, and there ſwims a fine thick matter like cream, for two or three inches depth on the ſurface. This they carefully ſkim off, and putting it into another veſſel, of clear water, they let it throw down any coarſe matter it may yet contain; and, finally, taking off the thick ſurface again, they mix this with ſome freſh water in another veſſel, and leave it to ſubſide; then pouring on the clean water, they take out the remainder at the bottom of the veſſel, which is perfectly fine, and reſembles a thick cream. To every hundred pounds of this they add one pound of a ſubſtance of the nature of which we are not yet perfectly informed. It is ſaid to be a mineral reſembling alum. They calcine this firſt, and then beat it to a fine powder; and this being added to the cream, or oil, as it is called, ſerves to keep it always in the ſame liquid ſtate. This ſubſtance, when finiſhed in this manner, has very little title to the name of an oil; it is rather a varniſh, and is always uſed in mixture with another varniſh, which

is called at this time fern oil, and uſed to be called lime oil; it is prepared in the ſame manner with the other after burning. See FERN-*Oil.*

OIL *of Sulphur* is a name given to the concentrated acid of ſulphur. See OIL, *ſupra*, and SULPHUR.

OIL *of Tartar.* See TARTAR.

OIL, *Train.* See *Whale* FISHERY, TRAIN, and WHALE.

OIL *of Turpentine* is obtained by diſtilling the reſin with water in a common ſtill, when the oil is found in the receiver ſwimming on the water, from which it is eaſily ſeparated. The average proportion is 60lbs. of oil from 250lbs. of good turpentine. This proceſs is carried on both abroad and at home; but the oil drawn in this country is always preferred. (See PINUS, and TURPENTINE.) The Dublin college directs 5lbs. of turpentine and four pints of water, and the oil to be diſtilled from a copper alembic. Yellow reſin will remain in the retort after the diſtillation.

The *rectified* oil of turpentine of the London and Dublin college is obtained from a pint (two pints Dub.) of oil of turpentine, and four pints of water. Diſtil the oil (a pint and a half of the oil, Dub.)

*Purified* oil of turpentine of the Edinburgh college is obtained from 1lb. of oil of turpentine, and 4lbs. of water; and diſtilling as long as any oil paſſes over. The rectification of the oil is a troubleſome proceſs, and on account of the great inflammability of the vapours, much caution is required to prevent them from eſcaping through the lutings of the veſſels, and catching fire. The rectified oil is a little lighter than the common oil, and completely free from any reſinous admixture; but in other reſpects it has no peculiar excellence to recommend it. What remains in the retort is a thick reſinous matter, and is denominated "balſam of turpentine." (See BALSAM.) For the chemical and medicinal properties of oil of turpentine, ſee PINUS, TURPENTINE, and TAPE *Worms.*

OIL *of Venus*, a name given by Lemery to the ſalt formed by the union of copper with the nitrous acid, when it is reſolved into a liquor by the moiſture of the air. This is a cauſtic and eſcharotic.

OIL, *Virgin*, is underſtood of oils expreſſed from olives, nuts, &c. freſh gathered, without being heated, too much preſſed, &c. See OIL *of Olives.*

OIL *of Vitriol.* See SULPHURIC *Acid* and VITRIOL.

OILS, *Volatile.* (See OIL, *ſupra.*) For the method of preparing theſe oils by the London college, ſee *Diſtilled* OILS, and for thoſe of the Dublin college, ſee *Eſſential* OILS, *ſupra.* The Edinburgh college directs the volatile oils to be prepared in the ſame manner as the diſtilled waters, except that leſs water is to be added. Seeds and woody ſubſtances muſt be previouſly bruiſed or raſped. The oil diſtils over with the water, and, as it is lighter or heavier, floats on the ſurface or ſinks to the bottom, and is afterwards ſeparated. It is neceſſary to obſerve, in preparing theſe oils, and alſo the diſtilled waters, that the quality of the ſubſtances, their texture, the ſeaſon of the year, and ſimilar circumſtances, muſt occaſion ſo many differences, that no general rules, that are applicable to every caſe, can be laid down. Few of the volatile oils are prepared by the apothecary. The oils of aniſe, chamomile, juniper, origanum, roſemary, and pimento, are uſually imported into this country; while thoſe of lavender, peppermint, ſpearmint, and penny-royal, are annually prepared on a large ſcale.

As medical agents, volatile oils are ſtimulant and ſtomachic. They are chiefly employed to remove nauſea and flatulence, to correct the griping qualities of ſome purgatives, and the diſagreeable taſte of other remedies. They may be given triturated with water and mucilage; or dropped firſt on a lump of ſugar, and through its medium diffuſed in water, forming a ſolution of what has been denominated "oleum ſaccharinum." The quantity of ſugar muſt be more than ten times the weight of the oil; and when they are well triturated together the oil becomes thus completely ſoluble in water, and may be diluted to any extent. Some of the more ſtimulant of theſe oils are added to embrocations to be uſed as rubefacients in caſes of numbneſs, pains, and paralytic affections of the joints. Thomſon.

OIL *of Wax.* See WAX.

OIL frequently takes new names from the drugs mixed with it; as *oil of roſes*, which is that mixed with roſes; *oil of jeſſamy*, that perfumed with jaſmin.

OIL *of Wine.* See ETHER.

OIL, *Anointing with.* See UNCTION.

OIL-*Bag*, a veſſel in birds replete with an unctuous ſubſtance, ſecreted by one ſometimes two glands, for the purpoſe, diſpoſed among the feathers; which being preſſed by the bill or head, emits its oily matter for dreſſing and pruning the feathers. See *Anatomy of* BIRDS.

OIL *Beetle.* See *Oil* BEETLE.

OIL-*Bladders*, in *Vegetable Phyſiology.* See *Secretions of* VEGETABLES.

OIL-*Dregs.* See DREGS.

OIL, *Gilding in.* See GILDING.

OIL, *Painting in.* See PAINTING.

OIL-*Mill*, in *Mechanics*, is a machine uſed to expreſs oil from linſeed, rape-ſeed, and other oleaginous grain, but chiefly from the above-mentioned for the uſe of painters. Olive and other vegetable oils, the produce of the ſouth of Europe, are alſo expreſſed by a machine, but it is not called a mill, being ſimply a ſtrong ſcrew-preſs, provided with a windlaſs or capſtan, to give it a greater power; in ſhort, it is the ſame machine as the CYDER *Preſs* (ſee that article). The olives are firſt pounded, or bruiſed, either in a large mortar, or by a running ſtone, in the ſame manner as the apples for making cyder. The pulp thus produced is put up in bags made of horſe-hair, and a pile of theſe, being made up under the preſs, the ſcrew is forced down by men working at a long lever, and the oil expreſſed: it runs very freely at firſt, and this, which is eſteemed the beſt quality, is in ſome countries kept ſeparate. When this preſſure has continued an hour or two, the power of the capſtan is applied. This produces a good quantity of oil of the ſecond quality, which is ſold at an inferior price; and in ſome provinces of Spain, where the olive is extenſively cultivated, it is uſed to burn in their lamps.

The oil-mill we intend to deſcribe in this article is for a different purpoſe; *viz.* the expreſſing of linſeed and rape-ſeed oils. Theſe grains are exceedingly hard and ſmooth on their ſurfaces, and the fragments of their ſhells, however broken, form little concavities which will retain the oil, unleſs a far greater preſſure is applied than can be obtained by a ſcrew-preſs; it is, therefore, done by a wedge-preſs. This conſiſts of a ſtrong block of wood, or a caſt iron frame, in which a long mortiſe is made: in this a bag of bruiſed ſeed is placed at each end, and blocks being put in to fill up the mortiſe, a wooden wedge is introduced between the blocks, and driven in by repeated blows of a heavy ſtamper, which is raiſed up by the power of the mill, and let fall upon the wedge, till it has driven it down as far as it will go. This cauſes a moſt immenſe preſſure upon the ſeed contained in the bags, and forces out the oil at every blow of the ſtamper: for it is a curious fact that the ſame preſſure,

preſſure, gradually produced, will not expreſs any ſenſible quantity of oil; it muſt, therefore, be done by a ſudden and violent acceſſion of force; accordingly, at every ſtroke upon the wedge, the oil exudes in conſiderable quantity from the ſeed, until the whole is expreſſed, leaving a cake of ſeed as hard as a piece of board. Theſe oil-cakes are very good food for cattle.

The machinery of an oil-mill is explained by the drawing in *Plate Oil-mill*, where *fig.* 1. is a plan, and *fig.* 2. an elevation, of a very good mill of this kind, which was erected after the deſigns of the late John Smeaton, eſq. F.R.S.; whoſe proportions for the parts of mills have been ſcarcely improved ſince his time; though in the conſtruction of the wheels, &c. caſt iron has of late years been ſubſtituted for wood almoſt univerſally. A, in both figures, is the water-wheel actuating the whole mill; it is underſhot; that is, the water paſſes under it, and turns the wheel, by its momentum ſtriking upon the floats. (See WATER-WHEEL.) It works very cloſe, in a pit formed between the two walls *c*, C, the latter being the outſide wall of the mill-houſe: it is framed on a ſtrong octagonal ſhaft B B, turning on two gudgeons fixed in its ends: D is the pit-wheel, or great cog-wheel, fixed upon the main ſhaft, within the houſe: it has wooden teeth fixed in its rim, parallel to its axis, in the manner of a crown-wheel. There are 80 of theſe teeth, by which it turns a ſmaller wheel, E, of 37 teeth, fixed on an horizontal ſhaft, F, called the tumbling ſhaft, extending nearly acroſs the houſe. It gives motion to the ſtampers, V, W, of the preſs, and alſo the rolling ſtones or runners, I, K, which bruiſe the ſeed. The latter is done by means of a wheel, G, with 35 teeth, fixed on the end of it, for the purpoſe of turning a large wheel, H, of 72 teeth, which is fixed upon a vertical ſhaft, *n*, which gives motion to the running ſtones, I, K. Theſe are two circular ſtones, fitted upon an iron axle, the ends of which are ſhewn at *a a*. This axle paſſes through the vertical ſhaft *m*, and alſo through runners: thus they have two motions, a rotation round their own axis, by which they are carried round upon the nether or horizontal mill-ſtone, L, on which they roll. The centre-holes in theſe running mill-ſtones are made a little wide, and the hole in the ſhaft *m*, which carries the middle of the iron axis, is made oval up and down. This great freedom of motion is neceſſary for the runner mill-ſtones, becauſe frequently more or leſs of the grain is below them at a time, and they muſt therefore be at liberty to get over it without ſtraining the ſhaft.

The lower mill-ſtone, L, is ſupported on maſonry, and ſurrounded by a border or ledge of wood *d d*, which prevents the ſeed being ſcattered: the two ſtones I, K, as the figure ſhews, are placed at different diſtances from the central axis *m*, ſo that they run in different paths, and thus bruiſe the ſeed more effectually than if they followed each other in the ſame circuit: *n*, *n*, are the ends of two wooden rails, projecting from the ſhaft *m*, and at their ends ſupporting two upright pieces of wood, which, at their inferior extremities, carry ſweeps or rakes: theſe drag round upon the ſurface of the lower ſtone, and turn the ſeed about, to receive the greateſt poſſible action from the ſtones I, K, rolling over it. There are two of theſe ſweeps on the oppoſite ſides of the ſtones, one called the outer rake, and the other the inner rake. The outer rake collects the grain under the runner from the ſurface of the border *d*. In this manner the grain is turned over and over, and cruſhed in every direction. The inner rake lays the grain in a ſlope or ridge, over which the runners paſs, and cruſh it: then the ſecond rake lifts it again into a ridge, to receive the action of the next ſtone, ſo that every ſide of the grain is preſented to the runner mill-ſtone, and receives its action, while the reſt of the lower ſtone is ſwept by them ſo clean, that not a ſingle grain is left on any part of it. The outer rake is alſo furniſhed with a rag of cloth, which rubs againſt the border of a hoop which ſurrounds the nether mill-ſtone, ſo as to drag out the few grains which might otherwiſe remain in the corners. There is alſo another ſweep, making part of the inner rake, which is occaſionally let down for ſweeping off all the ſeed when it has been ſufficiently bruiſed. The preſſure and action of theſe rakes are adjuſted by means of wooden ſprings, which cannot be eaſily and diſtinctly repreſented by any figure. The oblique poſition of the rakes (the outer point going foremoſt) cauſes them to ſhove the grain inwards, or towards the centre, and at the ſame time to turn it over ſomewhat in the ſame manner as the mould board of a plough ſhoves the earth to one ſide, and partly turns it over. Some mills have but one ſweeper, and indeed there is great variety in the form and conſtruction of this part of the machinery. The great pit, D, turns a ſmall cog-wheel *e*, *fig.* 1, on whoſe ſpindle is fixed one of the two iron rollers *f*, *g*, which are uſed for bruiſing the ſeed, as in the firſt operation.

Theſe rollers are made of caſt iron, and truly turned in a lathe, their ſpindles turning in braſs buſhes, fixed in iron frames bolted down to the wood work. Theſe frames have mortiſes in them, in which the buſhes for the pivots of the roller, *g*, are placed, with liberty to ſlide in the mortiſes when they are puſhed up by ſcrews ſcrewed through the ends of the iron frames. By theſe means the rollers can be ſet at any diſtance apart, according to the ſize of the ſeed which is to be cruſhed between them; *l*, *l*, are two ſmall iron cog-wheels, of 15 teeth each, fitted on the ends of the pivots of the rollers; they make both rollers turn together with the ſame motion: the ſeed is put into a hopper, ſupported at ſome diſtance above the roller, and it runs out at an opening in the bottom into a trough called the ſhoe, which is continually ſhaken by means of a piece of wood nailed to it, and reſting upon the cog-wheel *l*. By this means the ſhoe continually feeds the rollers with a ſmall quantity of ſeed, without any danger of choaking them up, and the ſeeds fall, from the end of the ſhoe, between the rollers, which, as they turn round, take the ſeed in between them, and bruiſe it. It is proper to have a piece of iron plate nailed to ſome part of the frame, and kept conſtantly preſſing againſt the rollers, ſo as to ſcrape off the ſeed which may adhere to them. The ſeed, after having paſſed between the rollers, falls upon an inclined board, placed in the frame beneath them, and is thus ſhot down in a heap before the rollers, from whence it is conveyed by a labourer to the rolling ſtones.

The preſs comes next to be noticed, for we have hitherto only deſcribed the machinery for bruiſing the ſeed previous to expreſſing the oil from it.

The tumbling ſhaft, F, has two lifters, M, N, projecting from it, which as it turns round lifts up and lets fall the ſtampers, V, W, of the preſs. They riſe and fall in a frame conſiſting of two thick pieces of wood P, P, firmly bolted together at the bottom by beams T, T, extended between them. The ſpace between theſe beams is filled up by the bags of ſeed at *d*, *d*, *fig.* 2, the preſſing wedge *b*, the diſcharging wedge *c*, and blocks of wood, to keep them at the proper diſtance apart.

The beams, T, T, have croſs pieces upon them, between which the ſtampers, V, W, ſlide up and down: they are lifted up by the wipers or lifters M, N, fixed upon the ſhaft F: theſe take hold of tappets or chocks projecting from the ſtampers, and raiſing them to the proper height, let them fall on the wedges. When they are to be ſtopped, the workman pulls a rope, which raiſes a lever, and holds up the ſtamper too high to meet the lifter in its revolution. The



inverted

inverted wedge, *c*, is ſuſpended by a rope from a wooden ſpring, which raiſes it up, as in the figure, when the other wedge is taken out for the purpoſe of putting a freſh charge of ſeed in the bags at *d d*. The opening of the preſs, or the ſpace contained between the uprights, P, P, of the frame, and the two beams T, T, has a very ſtrong caſt iron frame within it, which reſiſts the preſſure to rend the preſs open. The upper edge of this frame is ſhewn by the dark line in *fig.* 2, and the internal parts are ſhewn by dotted lines.

The bags of ſeed, *d*, *d*, are included between two iron plates, united together at the bottom in the manner of book lids, and the bag is ſhut up between them: immediately beneath theſe are ſmall holes in the bottom of the preſs, at which the oil oozes out into ſmall pots *k*, *k*: the blocks which fill up the preſs reſt upon the bottom of the preſs, to prevent them being carried down by the action of the wedges which ſlide againſt them, having thin pieces of wood between, to make them ſlide eaſily by each other: the preſſing wedge, *b*, has its point downwards, and is driven by the ſtamper V: the diſcharging wedge *c* is inverted, its ſmalleſt end being upwards; and this, when ſtruck by the ſtamper W, is forced down, and thus releaſes the preſs, when it would be exceedingly difficult to diſengage it by any other means, the preſſing wedge being driven in very faſt by the repeated blows of the ſtamper V.

There is likewiſe a ſmall apparatus in an oil-mill called the fire gear or chaufer pan, which we have omitted in our plate. It is intended to keep the bruiſed ſeed ſtirring whilſt it is heated in a copper pan, previous to preſſing, as this is found to increaſe the produce of oil. The chaufer pan conſiſts of a ſmall fire-place, ſituated in the corner of the mill-houſe, and heated by burning charcoal in it. The ſeed is contained in a circular copper pan, which is ſet over the fire, and the ſeed is prevented from burning to the bottom of the pan, by a croſs piece of iron fixed to the lower end of a vertical ſpindle, which, as it turns round in the pan, ſtirs the ſeed. The ſides of this croſs are ſet inclined, ſo as to ſcrape the ſeed from the bottom of the pan, and throw it over the back of the ſtirrer. The ſpindle for the ſtirrer is put in motion by means of a train of ſmall wheelwork, receiving motion from a rigger or pulley fixed upon the tumbling ſhaft F, by means of an endleſs chain or rope. In many of the moſt improved mills the chaufer pan is heated by ſteam inſtead of charcoal: in this caſe it has a falſe bottom on which the ſeed lays, and the ſteam from a boiler is admitted into the ſpace beneath the bottom. This is found to give the proper heat with greater preciſion than can be done (except by experienced workmen) with the charcoal fire; for if the heat is too great it makes the oil rancid, and if it is too low the produce of oil will be diminiſhed. In either caſe the pan muſt have a ſmall opening on one ſide, and a ſluice to ſhut it up and keep in the ſeed until it is properly heated. Immediately beneath the door are two hoppers, which lead the ſeed down at the ſide of the furnace, and conduct it into the flannel bags, which are hung at the lower extremity, or ſmall openings of the hopper. When the ſeed is ſufficiently heated, and the preſs is ready for it, the ſluice is opened, and the ſtirrer throws the ſeed out into the hoppers and the bags. Theſe are made of flannel cloth, which is found the beſt ſubſtance to reſiſt the preſſure and admit the oil through. The bags, before they are put into the preſs, are flattened by the hand, and wrapped up in a long ſlip of very thick leather, which encloſes it, and prevents the bag being burſt by the preſſure.

Our readers will now comprehend the ſtructure of the oil-mill; but as in all operations of this nature much management is requiſite to carry them on to the beſt effect, we ſhall briefly deſcribe the proceſs followed by our moſt careful manufacturers of oil.

Linſeed and rape-ſeed are the produce of almoſt every county in England, and as the conſumption of the oil for painting is not confined to particular places, the manufacture is carried on in every part of the kingdom. A great number of oil-mills are to be met with in Hull, and other parts of Yorkſhire, where they have the advantages of falls of water. The ſeed is firſt bruiſed between the rollers, to crack every grain without ſeparating their parts: this very much facilitates the operation of the grinding, for the grains are ſo hard and ſmooth, that they ſlip away from beneath the runner-ſtones, and it would require a long time to get all the grains cruſhed; but by the rollers every grain is broken, and then the runner-ſtones act with proper effect. The rollers require ſo much power, that in ſmall mills they cannot drive the other machines at the ſame time; but this is no objection to them, becauſe they act with ſuch rapidity, as in a very ſhort time to bruiſe ſeed enough for the whole day's work. The ſeed, after being cruſhed between the rollers, is ſpread by a ſhovel upon the nether mill-ſtone L, to be ground by the runners. That this may be more expeditiouſly done, one of the runners is ſet about two-thirds of its own thickneſs nearer the ſhaft than the other. Thus they have different circuits, and the grain, which is a little heaped towards the centre, is thus bruiſed by both. The inner rake gathers it up under the outer ſtones into a ridge, over which the ſtone paſſes and flattens it: it is then gathered up again by the outer rake into a ridge under the inner ſtone. The outer rake conſiſts of two parts; the outer part preſſes cloſe on the wooden border *d d*, which ſurrounds the nether ſtone, and ſhoves the ſeed obliquely inwards, while the inner part of this rake gathers up what had ſpread towards the centre.

The outer rake has a joint near the middle of its length, by which the outer half of it can be raiſed from the nether ſtone, while the inner half continues preſſing on it, and thus ſcrapes off the moiſt ſeed, which is like a paſte. When the ſeed is ſufficiently bruiſed, the miller lets down the outer end of the rake; this immediately gathers the whole charge, and ſhoves it obliquely outwards to the wooden rim, where it is at laſt brought to a part that is left unboarded, and it falls to the ground. In the Dutch mills it falls through troughs placed to receive it. Theſe troughs have holes in the bottom, through which the oil drips all the time of the operation. This part of the oil is conveyed into a peculiar ciſtern, being conſidered as the pureſt of the whole, having been obtained without preſſure, by the mere breaking of the hull of the ſeed.

The ſeed in this country is ſeldom ſo ripe as to yield any oil in this ſtage without preſſure; but in ſome mills they take a quantity of their beſt ſeed from the ſtones, and putting it into bags give it a moderate preſſure by a ſcrew-preſs. The oil thus obtained is called cold drawn, and is ſold at a higher price for the uſe of cabinet makers, who rub their ornamental wood work with it to give a poliſh: in other work, the cold drawn oil is nothing more than the firſt obtained by the preſs, but without heating the ſeed.

In ſome of the Dutch mills, a much greater quantity of oil is obtained in the grinding, without preſſure, by having the bed of maſonry, which ſupports the lower mill-ſtone, formed into a little furnace and gently heated. But the utmoſt care is neceſſary to prevent the heat from becoming conſiderable. This enabling the oil to diſſolve more of the fermentable ſubſtance of the ſeed, expoſes the oil to the riſk of growing ſoon very rancid, and in general it is thought a hazardous

a hazardous practice, and the oil does not bring so high a price.

When the seed is very dry, a little water is thrown in among it whilst grinding, which is found to facilitate the process. In about twenty minutes a charge of seed will be sufficiently ground, and is then carried to the chaufer pan, where it is heated previous to being pressed. Here the stirrer keeps it from burning to the bottom of the pan: while this is doing the wedges of the press are taken out, both the stampers are hauled up, and the iron lids at *d d*, which are to include the bags of seed, are opened out ready to receive them. When the seed is sufficiently heated the sluice is opened, and the stirrer throws it out into the bags, the workman flattens them, wraps them in the leather, and puts them into their places. The wedge, *b*, is now introduced, and the stamper, V, disengaged to drive it down. After a few blows the oil begins to run, and this continues till the wedge gets so fast, that the stamper will rebound up from it two or three times: it is then judged that it can be driven no farther. The stamper, V, is now hauled up, and the other let loose. This at one or two blows drives down the wedge W, and relieves the pressure, after which the wedge and the bags may be taken out to put in a fresh charge. The contents of the bag are compressed into a dense cake, from which the bag is stripped off, and the cakes are ground up, and subjected to a second pressure. They are broken into pieces by the shovel, and thrown under the runners, where the cake is again broken down, and the parenchyma of the seed reduced to a fine meal. Thus free egress is allowed to the oil from every vesicle in which it is contained. But it is now rendered much more clammy by the forcible mixture of the mucilage, and even of the finer parts of the meal. When sufficiently ground the workman conveys the paste to the chaufer pan, where it is heated rather more than for the first time, and the second pressure is conducted in the same manner as the first. The produce of oil from the second operation is very uncertain; as it depends upon a number of circumstances. It will sometimes exceed the quantity of the first time, and at other times it will not be half as much. The bags for the second pressure are filled with twice as much seed as the first time, and the cake will be more than twice as thick. The linseed cakes are sold at a high price for cattle, but the rape-seed cakes are ground to a coarse powder, and in that state sold for manure.

The mill shewn in our plate is on a small scale, but many mills have from 10 to 15 presses in use. A press will generally press seven cwt. of seed *per* day the first time, but only two, or two and a half cwt. for the second time, because it requires as much more time for the last operation.

Respecting the produce of oil from linseed, we have found from an average of four months work of an oil-mill in Yorkshire, that 280 quarters of linseed, generally weighing 30 stone (of 14lbs. each) *per* quarter, produced 5616 gallons of oil, which is at the rate of $20\frac{2}{3\frac{1}{5}}$ gallons *per* quarter. The greatest produce in the period from which this average was obtained, was 409 gallons from 20 quarters, or $20\frac{9}{20}$ gallons *per* quarter. The least produce was $19\frac{4}{5}$ gallons *per* quarter.

Oil *Stone, cos olearia*, in *Natural History*, is a stone of a whitish colour, with a faint mixture of a blueish-grey; and it is sometimes ornamented with black spots and dendritæ. It is of a moderately fine and compact texture, hard and heavy, and capable of a tolerable polish. It is not acted upon by acids, gives fire very freely with steel, and when burnt, acquires a pure white colour. This stone has not yet been found in England; but in the eastern parts, and in Germany, there are large strata of it. It is much used by our artificers for setting a fine edge on their tools, and is only used with oil, which by degrees changes its colour to a deep brown. They call it the Turkey-stone. De Costa's Hist. of Fossils, p. 153.

Oil-*Tree*, in *Botany*. See Ricinus.

Oil *Creek*, in *Geography*, a river of America, in Alleghany county, Pennsylvania, which issues from a spring, on the surface of which floats an oil, similar to that called Barbadoes tar, and which runs into Alleghany river. The oil is found in such quantities, that a person may gather several gallons in a day. Those who have been affected with rheumatic complaints have found relief by bathing their joints in this oil; and the water drank freely, has operated as a cathartic.

OILS, in *Agriculture*, a provincial term used to signify the beards, or prickles of barley, &c.

Oily Grain, in *Botany*. See Sesamum.

The sesamum, with oblong entire leaves, called the Eastern fox-glove, is much used by the Egyptians and African Negroes, both as food and medicine. The Arabians call the expressed oil of the seeds *zeid taib*, that is, good oil, by way of eminence, because it is of frequent use with meats; and in Egypt is sold dearer than oil of olives. Parkinson.

Oily *Waters*. See Waters.

OINGHT, or Yoingt, in *Geography*, a town of France, in the department of the Rhone and Loire; 7 miles W.S.W. of Villefranche.

OINTMENT, in *Pharmacy* and *Surgery*, &c. See Unguent.

OIRSBECK, in *Geography*, a town of France, in the department of the Lower Meuse, and chief place of a canton, in the district of Maestricht. The place contains 803, and the canton 10,340 inhabitants, on a territory of 100 kiliometres, in 14 communes.

OISE, one of the twelve departments of the second or northern region of France, formerly Beauvaisis, deriving its name from the river Oise, which joins the Seine, 5 miles S. of Pontoise. It is situated N. of the Seine and Oise, in N. lat. 49 25', and bounded on the N. by the department of the Somme, on the E. by that of the Aisne, on the S. by the departments of the Seine and Marne, and Seine and Oise, on the W. by the departments of the Eure and the Lower Seine. It is 27 French leagues in length, and 18 in breadth, and contains $6082\frac{1}{2}$ kiliometres, or 298 square leagues, and 369,086 inhabitants. It is divided into four circles, or districts, 35 cantons, and 738 communes. The circles are, Beauvais, comprehending 122,786 inhabitants; Clermont, 84,942; Compiegne, 88,048; and Senlis, 73,310. According to Hassenfratz, the circles are 9, the cantons 76, and the number of inhabitants 385,206. The capital is Beauvais. The contributions, in the 11th year of the French era, amounted to 4,714,895 fr. and the expences to 293,983 fr. 33 cents. The soil in this department, consisting of plains and eminences, is of different qualities, but in general is fertile, yielding grain, flax, pasture, &c.

OISEAU, in *Conchology*, the name of a peculiar species of oyster, of so remarkable a figure, that it represents a bird, with its wings expanded, and has a small protuberance at the hinge, representing a head, and a long process at the opposite end, which very well represents a tail. It is of a dusky reddish colour on the outside, and of a fine pearly hue within. When the outside of this shell is taken off, and it is nicely coloured, by cutting it down to a proper depth in every part, it is of a fine reddish yellow, and is the aurora shell of collectors.

OISEL, James, in *Biography*, professor of law at Groningen,

ningen, was born at Dantzic in 1631, and died in 1686. His works are corrections and notes on various authors, a treatise entitled "Thesaurus selectorum Numismatum antiquorum ære expressorum," and a "Catalogue" of his library, which was large and valuable. Moreri.

OISELE, in *Geography*, a town of Westphalia, in the bishopric of Osnabruck; six miles E.S.E. of Osnabruck.

OISEMONT, a town of France, in the department of the Somme, and chief place of a canton, in the district of Amiens; 21 miles W. of Amiens. The place contains 1030, and the canton 10,339 inhabitants, on a territory of 165 kiliometres, in 35 communes.

OISTER, in *Zoology*. See Oyster.

Oister's *Town*, in *Geography*, a town which stands on a bay, to which it gives name, near the southern extremity of the island of Barbadoes, formed to the S.E. by Kendal's point, and well defended by forts; four miles E.S.E. of Bridgetown.

OISY, a town of France, in the department of the straits of Calais; eight miles S. of Douay.

OITAMA, a town of Japan, in the island of Niphon; 25 miles N.W. of Mogani.

OITS. See Omi.

OKA, or Okka, a river of Russia, which rises in the government of Orel, and after watering that and the governments of Kaluga, Tula, Mosco, Rezen, Tambof, Vladimir, and Nishnei-Novgorod, falls at the city of the last-mentioned name into the Volga. This is a very considerable river, navigable to its upper regions, taking up a multitude of smaller streams, and thus effecting an excellent communication between most of the inland governments of the empire. On its left it receives the Ugra, the Moskva, and the Kliasma; and on its right, the Upa, the Oset, and the Moskha.—Also, a river of Russia, which runs into the Angara, near Bratskoi. N. lat. 56° 5′. E. long. 101° 40′.

OKAKEE, a town of America, in Virginia; 10 miles S.W. of Dumfries.

OKAMUNDEL, a circar of Hindoostan, in Guzerat, on the S. side of the gulf of Cutch. The chief town is Nonagur.

OKANDA, a town of Japan, in the island of Niphon; 55 miles E. of Jedo.

OKANDE, a town of Ceylon, on the E. coast; 24 miles S. of Trincomaly.

OKASAKI, a town of Japan, in the island of Niphon. N. lat. 35° 40′. E. long. 138°.

OKE, an Egyptian weight, consisting of three rotolos, each of twelve ounces, at twelve drachms to the ounce, and sixteen carats to the drachm.

OKEHAM, in *Geography*. See Oakham.

OKEHAMPTON. See Oakhampton.

OKEISUT, a cape on the W. coast of West Greenland. N. lat. 61° 48′. W. long. 50° 3′.

OKELAS, in Egypt, and some other of the eastern countries, are a sort of indifferent buildings round a court, and commonly appropriated to the merchants of some particular country, with their goods; as at Cairo, there is one for the merchants of Nubia, and the black slaves, and other goods they bring with them; and another for white slaves from Georgia.

OKER. See Ochre.

OKERAH, in *Geography*, a town of Bengal; 43 miles N.W. of Burdwan. N. lat. 23° 49′. E. long. 87° 20′.

OKI, an island of Japan, about 60 miles in circumference, near the N.W. coast of Niphon. N. lat. 35° 50′. E. long. 133° 30′.

OKIANOW, a town of the duchy of Warsaw; 20 miles N. of Warsaw.

OKILPOUR, a town of Hindoostan, in Bengal; 20 miles S.E. of Mauldah.

OKLANDBEIG, a town of Norway, in the province of Aggerhuus, on the Glomme; eight miles S. of Christiana.

OKLANSK, a town of Russia, near the gulf of Penzinskaia. N. lat. 63° 30′. E. long. 163° 44′.

OKMIANY, a town of Samogitia; 28 miles N. of Medniki.

OKNA, a town of European Turkey, in Moldavia; 44 miles S. of Niemecz.

OKOLSKI, in *Biography*, a Dominican, was a native of Russia, and became provincial of his order in Poland in 1649. He published, in 1641, at Cracow, a work entitled "Orbis Polonus," in three volumes folio, being a history of the Polish nation, with learned researches concerning the origin of the Sarmatians. The work is very rare, and of high value. He was author also of a work entitled "Preco divini verbi Albertus episcopus Ratisponenis."

OKONE, in *Geography*, a town of East Florida, on the Ashley. N. lat. 50° 10′. W. long. 84° 16′.

OKOTSK. See Ochotsk.

OKOTSKOI, or Okhotskoi. See Ochotskoi.

OKRAH, a town of Hindoostan, in the circar of Gurrah; 10 miles N. of Mahur.

OKSOR. See Acsor.

OKU-JESSO, signifying Upper Jesso, or North Jesso, an island on the coast of Tartary, separated from Jesso by a strait, and peopled by inhabitants who have the same origin with the Kuriles, though it lies 150 leagues to the westward of the Kurile islands. It is the same island with that which is called *Segalien* and *Tchoka*; which see.

OKULOKA, a town of Russia, in the government of Archangel, on the river Pinega; 180 miles S.E. of Archangel.

OKUNEVO, an ostrog of Russia, in the government of Tobolsk, on the Enisei or Yenisei. N. lat. 69° 25′. E. long. 87° 24′.

OKUNEVSK, a town of Russia, in the government of Tobolsk, on the Mijas; 200 miles S.W. of Tobolsk. N. lat. 55° 40′. E. long. 63° 54′.

OKUS, a bay on the W. coast of the island of Ximo, N. of Nangasaki.

OLABUS, in *Ancient Geography*, a town of Asia, in Mesopotamia, situated on the left bank of the Euphrates.

OLAF, in *Biography*, king of Norway in the 10th century, sent missionaries into Greenland to convert the inhabitants of that country to Christianity.

OLAHUS, Nicholas, a learned prelate, who flourished in the 16th century, was born of an ancient family at Hermanstadt in 1493. Being brought up to the ecclesiastical profession he obtained various instances of preferment, till at length he was nominated by Ferdinand, king of Hungary, bishop of Zagrat, and chancellor of the kingdom. He was afterwards elevated to the see of Agria, and in that character was present at the famous siege of that town by the Turks in 1552, in which he contributed greatly, by his liberality and exhortations, to the spirited and successful defence made by the inhabitants. In 1553 he was appointed archbishop of Strigonia, and during the fifteen years in which he occupied this station, he assiduously attended to the interests of religion and morality. He held two national councils at Tyrnau, the acts of which were printed at Vienna in 1560. It was chiefly through his munificence that the first Jesuits' college in Hungary was founded at Tyrnau. In

1562

1562 he was created palatine of the kingdom, in which quality he crowned Maximilian as king of Hungary. He died at Tyrnau in 1568; leaving behind him, as monuments of his induſtry and learning, "A Chronicle of his own Times:" "A Hiſtory of Attila," and "A Deſcription of Hungary."

OLAM, in *Geography*, a river which riſes in Thibet, and entering into the province of Chen-ſi, in China, changes its name into Tai-tong, and finally loſes itſelf in the Hoang. N. lat. 36° 10′. E. long. 102° 44′.

OLAND, a ſmall iſland of Denmark, in the North ſea; eight miles N. of Nordſtrand.

OLANE, in *Ancient Geography*, a town of Aſia, in the mountains of the Greater Armenia, and in the vicinity of Artaxata. Strabo.

OLANGO, in *Geography*, a ſmall iſland among the Philippines, near the E. coaſt of Siba. N. lat. 10° 33′. E. long. 123° 51′.

OLANOW, a town of Poland, in Volhynia; 28 miles S.W. of Berdiczow.

OLAN-POULAC, a town of Thibet; 75 miles N. of Haralope-pai.

OLARGUES, a town of France, in the department of the Herault, and chief place of a canton, in the diſtrict of St. Pons; ſeven miles N.E. of St. Pons. The place contains 1037, and the canton 9272 inhabitants, on a territory of 312½ kiliometres, in 12 communes. N. lat. 43° 33′. E. long. 3° 0′.

OLARTE, Fr. Diego de, in *Biography*, "was," ſays Mr. Southey, "a townſman and ſervant of Cortes, whom he accompanied to Mexico, and bore his ſhare in the guilt and the glory of that wonderful, but atrocious conqueſt. Olarte, however, enjoyed none of the ſpoils; and made the beſt atonement he could to the Mexicans, by entering the Franciſcan order, and living the life of a miſſionary among them forty years, inflicting upon himſelf during all that time penances, which proved the ſincerity of his contrition." He was one of the moſt ſucceſsful miſſionaries, and beſt loved by the natives. At different times he was guardian of the convent at Mexico, definidor of the province, and afterwards provincial. In 1567, the viſitors whom Philip II. ſent to proceed againſt the rebels, ordered him to Spain as a ſuſpected perſon; he cleared himſelf ſatisfactorily of the charge, and returned with the rank of comiſario-general of New Spain. But the fatigue of the voyage, and the anxiety which he had undergone, was too much for his old age, and he died ſhortly after his return in 1569.

OLASH, in *Geography*, a town of Aſiatic Turkey, in the government of Sivas; 10 miles S. of Sivas.

OLASSGUNGE, a town of Hindooſtan, in Bahar; 32 miles S. of Patna. N. lat. 25° 5′. E. long. 85° 20′.

OLAVIDES, the *Count de*, in *Biography*, was born in Spaniſh America, but had his education at Madrid, where he was ſecretary to the count de Aranda, whom he accompanied in his embaſſy to France. On his return to Spain Charles III. created him count, and appointed him to the office of ſuperintendant of Seville. He undertook the great work of fertilizing the Sierra Morena, or Black Mountain, a completely deſert region. By his perſeverance, and with the aid of the colonies of Germans which he carried thither, it aſſumed a new face. Notwithſtanding the benefits which he had thus rendered his country, he fell into diſgrace, and was ſent to priſon, from whence he effected his eſcape to Venice, where he died at the age of ſixty-five. A work entitled "El Evangelio en Triumf," or "The Triumph of the Goſpel," in four volumes, 4to. is attributed to him.

OLAX, in *Botany*, ſo called, as Linnæus, the author of the name informs us, from ὠλαξ, *a furrow*, but how it applies to the plant we are not informed; nor is the difficulty of the queſtion leſſened by the name being ranged, in *Phil. Bot.* 184, among thoſe which allude to the medicinal effect of the plants that bear them.—Linn. Gen. 22. Schreb. 29. Willd. Sp. Pl. v. 1. 185. Vahl. Enum. v. 2. 33. Mart. Mill. Dict. v. 3. Brown. Prodr. Nov. Holl. v. 1. 357. Juſſ. 153. Gærtn. t. 179. (Fiſſilia; Juſſ. 260. Willd. Sp. Pl. v. 1. 194. Lamarck Illuſtr. t. 28. Spermaxyrum; Labillard. Nov. Holl. v. 2. 84.)—Claſs and order, *Triandria Monogynia*. Nat. Ord. *Sapotæ*, Juſſ. *Santalaceis affine*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, hemiſpherical, undivided, entire, permanent. *Cor.* Petals ſix, combined in pairs by means of the fertile ſtamens, oblong, obtuſe, equal. *Stam.* Filaments three, alternate with, and combining the petals, ſhort; anthers heart-ſhaped erect; barren filaments ſix, longer, moſtly forked, one inſerted into the middle of each petal. *Piſt.* Germen ſuperior, roundiſh; ſtyle thread-ſhaped, ſhorter than the corolla; ſtigma obſcurely three-lobed. *Peric.* Drupa encloſed in the coloured calyx. *Seed.* Nut cruſtaceous, of one cell.

Eſſ. Ch. Calyx undivided. Petals ſix, cohering in pairs by the ſtamens. Barren filaments ſix. Drupa inveſted with the enlarged calyx.

Obſ. The petals are, in ſome caſes, but five, and therefore vary in their degree or mode of connection. Mr. Brown obſerves that the New Holland ſpecies have the barren filaments ſimple, not forked, and only five petals, one of which is not connected with the reſt. The flowers are ſometimes polygamous.

1. O. *zeylanica*. Linn. Sp. Pl. 48.—Leaves ovate, pointed, ſmooth on both ſides. Branches angular.—Native of Ceylon. We received a ſpecimen from the late profeſſor Van Royen, but there is none in the Linnæan herbarium, nor do we find any figure of this ſpecies. The *branches* are ſmooth, long and wavy, obſcurely angular, of a tawny brown. *Leaves* alternate, on ſhort ſtalks, ovate, pointed, entire, wavy, ſmooth on both ſides, about two inches long, with one rib and ſeveral fine tranſverſe veins. *Flowers* in little axillary forked panicles, quite ſmooth in every part. Vahl deſcribes the leaves as nearly deſtitute of veins.

2. O. *ſcandens*. Roxb. Coromand. v. 2. 2. t. 102.—Leaves elliptical, obtuſe; downy beneath. Calyx minutely fringed.—Native of foreſts on the coaſts of Coromandel, flowering all the year round. *Trunk* inclining, often as thick as a man's thigh. *Branches* long, climbing, or trailing, round and downy when young. *Leaves* about the ſize of the laſt, but elliptical, two-ranked, ſoft and downy beneath, becoming ſmooth by age. *Flowers* in ſhort axillary cluſters, whitiſh ſmall. *Fruit* yellow, pulpy, inveſted with the enlarged, coloured, but ſcarcely pulpy, calyx.

3. O. *pſittacorum*. Vahl. Enum. v. 2. 33. (Fiſſilia pſittacorum; Lamarck Illuſtr. 102. t. 28.)—Leaves elliptic-lanceolate, very ſmooth. Branches round. Gathered by Commerſon in the iſle of Bourbon, and by Koenig in Ceylon. A buſhy *tree*, with round, ſmooth, rather zigzag branches. *Leaves* on very ſhort ſtalks, ſmooth and even, rather coriaceous, nearly two inches long. *Flowers* larger than in either of the foregoing. Vahl deſcribes five petals, one of which is unconnected with the reſt. The *drupa* is the ſize of a currant, partly covered by the apparently fleſhy calyx, not unlike the fruit of the Yew, at leaſt in ſhape.

4. O. *Phyllanthi*. Brown. n. 1. (Spermaxyrum Phyllanthi; Labill. Nov. Holl. v. 2. 84. t. 233.)—Leaves elliptical, emarginate. Stalks ſingle-flowered.—Native of the ſouth coaſt of New Holland. A *ſhrub* about ſix feet high, with

with numerous round branches. *Leaves* nearly ſeſſile, about half an inch long, of a broad elliptical figure, with a notch at the end, ſmooth. *Flowers* axillary, ſolitary, on ſimple ſtalks, ſhorter than the leaves, ſome male, others female, with a few united ones, all on the ſame plant. Labillardiere deſcribes the fruit as a *capſule*, burſting elaſtically towards the top, and inveſted with the calyx. The cracked *drupa* might, when dry, have the appearance of a capſule.

5. O. *ſtricta*. Brown n. 2.—"Leaves oblong-linear, with a ſmall point. Stalks ſingle-flowered."—Found near Port Jackſon, New South Wales.

6. O. *aphylla*. Br. n. 3.—"Leaves none. Spikes polygamous."—Gathered by Mr. Brown in the tropical part of New Holland.

OLAYOON, in *Geography*, a town of Hindooſtan, in the Carnatic; 15 miles S.E. of Tritchinopoly.

OLBA, in *Ancient Geography*, a town of Aſia, in Cilicia Trachea, or mountainous Cilicia, at a certain diſtance from the ſea, in the country called "Ketida," inhabited by the "Kennati," who were ſubject to the ſovereigns of Olba. Some medals of this ancient place inform us that Olba had the title of ἱερα, or ſacred; and that Polemon, one of the ſovereigns of Olba, took the name of Marc Antony, in honour of this Roman. It was in the year of Rome 713, that Aba received from Antony the principality of Olba, an epocha at which Antony and Cleopatra ſojourned in Cilicia. In proceſs of time the head of Auguſtus was found on ſome medals of Olba. The territory of Olba ſeems to have been both extenſive and fertile; it was watered by many ſtreams, and produced plenty of vines and fruit-trees. Under the lower empire Olba comprehended the province of Iſauria, and became an epiſcopal ſee; but from the time of Heraclius, it belonged to the diſtrict of Seleucia.

OLBASA, a town of Aſia, in Piſidia.—Alſo, a town of Antiochan Cappadocia. The name was alſo aſſigned to three towns in Aſia Minor.

OLBEGO, in *Geography*, a town of Spain, in Old Caſtile; 20 miles S. of Soria.

OLBERSDORF, the chief town of a lordſhip in Sileſia, in the principality of Jagerndorf; ſeven miles N.W. of Jagerndorf. N. lat. 50° 16'. E. long. 17° 44'.

OLBIA, in *Ancient Geography*, a maritime town on the E. coaſt of the iſland of Sardinia; with a port. It was built by the Greeks according to Pauſanias, and as Florus ſays, ravaged by Scipio.—Alſo, a town ſituated in the ſouthern part of Sardinia; built, ſays Livy, by Iolaus.—Alſo, a town of Gallia Narbonnenſis, on the ſea-coaſt; founded by the Marſilians, over-againſt the Stecades iſlands, where they kept a garriſon to guard againſt pirates.—Alſo, a town of Sarmatia, called Olbiopolis and Miletopolis, now "Kezikirman," ſituated at the confluence of the Hypanis and Boryſthenes. It was a colony of Mileſians.—Alſo, a town of Aſia, in Bithynia, called "Oliba," on the rivers of the Propontide.—Alſo, a town of Aſia, in Pamphylia, on the confines of Lycia.

OLBROM, in *Geography*, a town of Poland, in the palatinate of Cracow; 28 miles N.N.W. of Cracow.

OLBY, a town of France, in the department of the Puy de Dôme; nine miles W.S.W. of Clermont.

OLCADES, in *Ancient Geography*, a people who occupied the interior of Hither Spain; their territory was extenſive, and lay to the ſouth of the Carpetani.

OLD AGE. See AGE, and LONGEVITY.

OLD *Aſtronomy*. See ASTRONOMY.

OLD *Buffs*, in *Military Language*, a name given to the third regiment of foot. This regiment was put on the regular eſtabliſhment of the army in the year 1665, and denominated the "Buffs," from being the firſt whoſe accoutrements were made of leather prepared from the buffalo, after the manner of ſhamoy. The waiſtcoats, breeches, and facings of the coat were afterwards directed to be made of a correſponding colour. When other regiments aſſumed this part of their appointment, the third acquired the name of the "Old Buffs." This regiment has the privilege (and we believe excluſively) of marching through the city of London by beat of drum. Whether it derived this privilege from having exerted itſelf in the protection of the city, or from having, as has been vaguely reported, been at firſt compoſed of men who belonged to the train band, we cannot aſcertain. The uniform is red, with buff facings, buff waiſtcoats and breeches. The thirty-firſt regiment, which has the ſame uniform, is commonly called the "Young Buffs."

OLD *Impoſition of Tonnage*. See DUTY.

OLD *Man's Beard*, in *Botany*. See CLEMATIS.

OLD *Milk*, in *Rural Economy*, a provincial word ſignifying ſkim-milk.

OLD *Style*. See STYLE.

OLD *Subſidy*. See SUBSIDY.

OLD-*Wife Fiſh*, in *Ichthyology*, a name by which a ſpecies of baliſtes is called in ſeveral of our plantations. See ACARAUNA.

OLD-*Wife* is alſo a name given to the wraſſe, a ſpecies of labrus.

OLD *Works*, in *Mining*, are ſuch that are either fallen in or ſtand unwrought.

OLD *Fort Bay*, in *Geography*, a bay on the S. coaſt of Canada, on the river St. Lawrence. N. lat. 51° 26'. W. long. 58°.—Alſo, a bay at the S. end of the iſland of St. Lucia.—Alſo, a cluſter of ſmall iſlands in the gulf of St. Lawrence. N. lat. 51° 20'. W. long. 57° 45'.

OLD *Cape Françoiſ*, forms the N. point of Coſbeck bay, on the N.E. part of the iſland of St. Domingo; five leagues E. of Cape de la Roche. N. lat. 19° 40' 30".

OLD *Harbour*, a bay on the S. coaſt of Jamaica, W. of Port Royal, having many ſhoals and iſlands at its entrance.

OLD *Head*, a cape on the S.E. coaſt of Ronaldſha, one of the Orkney iſlands. N. lat. 58° 37'. W. long. 2° 47'.

OLD *Man*, a cape on the W. coaſt of Africa. S. lat. 14° 40'.

OLD *Man's Bay*, a bay on the S. coaſt of Newfoundland; 80 miles E. of Cape Ray.

OLD *Man's Creek*, a river of New Jerſey, which diſcharges itſelf into the Delaware, and ſeparates the counties of Salem and Glouceſter.

OLD *Man's Port*, lies northward of Lima river, in Peru; eight or nine miles N. of Cadavayllo river.

OLD *Nabb*, a cape of England, on the coaſt of Yorkſhire; nine miles N.W. of Whitby.

OLD *Peak*, a cape of England, on the coaſt of Yorkſhire; nine miles N.N.W. of Scarborough.

OLD *Road*, a town and harbour in the iſland of Antigua.

OLD *Town*, a town of the ſtate of New York, on Staten iſland; 12 miles S.W. of New York.

OLD *Road Town*, a town of the iſland of St. Chriſtopher, in a bay that has from five to fifteen fathoms of water near the ſhore; five miles W. of Baſſe Terre. N. lat. 17° 25'. W. long. 62° 48'.

OLD *Town*, a town of the ſtate of Georgia; 16 miles S.S.E. of Louiſville.

OLD *Town Creek*, a river of North Carolina, which runs into Cape Fear river. N. lat. 34° 8'. W. long. 78° 9'.

Old *Town*, a town of Maryland, in Alleghany county, on the N. bank of Patomac river; 14 miles S.E. of Cumberland. N. lat. 39° 38'.—Alſo, a town of North Carolina, near Brunſwick.—Alſo, an Indian town, in one of the 54 iſlands reſerved by the Indians for their uſe in Penobſcot.

OLDCASTLE, *Sir* John, in *Biography*, frequently denominated the good lord Cobham, was born in the reign of Edward III., and is ſaid to have been the firſt author, as well as the firſt martyr, among the Engliſh nobility. He obtained his peerage by marrying the heireſs of a lord Cobham who oppoſed the tyranny of Richard II. He was one of the leaders of the reforming party, and was at great expence in procuring and diſperſing copies of Wickliffe's writings among the people, as well as by maintaining a number of his diſciples as itinerant preachers. In the reign of Henry V. he was accuſed of hereſy, the growth of which was attributed to his influence. Being attached to the court, the king delayed his proſecution, that he might reaſon with him himſelf, but not being able to reclaim him to the church of Rome, he, in great diſpleaſure, reſigned him to its power. He was accordingly ſingled out as a proper victim of eccleſiaſtical ſeverity, whoſe puniſhment it was thought would ſtrike a terror into the whole party, and teach them they muſt expect no mercy. He was indicted at the inſtance of Arundel, archbiſhop of Canterbury, who, with the aſſiſtance of the biſhops of London, Wincheſter, and St. David's, condemned him to the flames, on account of his erroneous opinions. Lord Cobham, who was confined in the Tower, made his eſcape before the day appointed for his execution. He retired into Wales, where he lay concealed for four years. He formed, in his retreat, a plan to ſeize the king. Eltham was the place at which the plot was to be executed; Henry was apprized of the fact, and immediately removed to Weſtminſter; Cobham was not diſcouraged by the diſappointment, but changed the place of rendezvous to a field near St. Giles's. The king now had recourſe to offenſive meaſures, cauſed the gates of the city to be ſhut, to prevent any reinforcement of the Lollards, as they were denominated, from that quarter, came into the field in the night-time, ſeized ſuch conſpirators as appeared, and took priſoners many others whom he apprehended on their road. Cobham himſelf again made his eſcape, but was afterwards taken, when he was hanged as a traitor, and his body was burnt on the gibbet, in execution of the ſentence pronounced againſt him as a heretic. He wrote "Twelve Concluſions, addreſſed to the Parliament of England."

Oldcastle, in *Geography*, a ſmall poſt-town of the county of Meath, Ireland; 41 miles N.W. from Dublin.

OLDE, or Hold, a town of Germany, in the biſhopric of Munſter; 20 miles S.E. of Munſter.

OLDEN, a town of Norway, in the province of Bergen; 95 miles N.N.E. of Bergen.

OLDENBROECK, a town of the duchy of Bremen, at the mouth of a ſmall river, which runs into the Elbe; 27 miles N.W. of Stade. N. lat. 53° 52'. E. long. 8° 39'.

OLDENBURG, Henry, in *Biography*, a learned German in the ſeventeenth century, was deſcended from the counts of Aldenburg in Weſtphalia, and born in the duchy of Bremen, in Lower Saxony, about the year 1626. During the time of the Long parliament in the reign of Charles I. he came to this country in the character of conſul, a poſt which he continued to occupy under the adminiſtration of Cromwell. Afterwards he accepted the office of tutor to lord Henry O'Bryan, a young Iriſh nobleman, whom he attended to the univerſity of Oxford; and in 1656 he entered himſelf ſtudent in that univerſity, in order that he might have an opportunity of conſulting ſuch books as he wanted, chiefly in the Bodleian library. He was ſome time after this appointed tutor to lord William Cavendiſh, and became the intimate acquaintance and friend of the illuſtrious John Milton, who addreſſed to him four letters in his "Epiſtolæ Familiares." He was elected one of the earlieſt members of the Royal Society, and was afterwards choſen aſſiſtant ſecretary to Dr. Wilkins. No ſooner had he undertaken this office, than he applied himſelf to the ſeveral duties attached to his office with the utmoſt aſſiduity and zeal, and publiſhed the firſt number of the "Philoſophical Tranſactions." He eſtabliſhed a correſpondence with more than ſeventy perſons, in different parts of the world, on a vaſt variety of ſubjects. The method which he contrived to get through his buſineſs was to proceed in his work by the moſt ſimple mode; he never read a letter until he had before him, pen, ink, and paper, ready to anſwer it forthwith, ſo that the multitude of his letters never wearied him, nor ever lay heavy on his hands. He was the conſtant correſpondent of Mr. Robert Boyle, and tranſlated ſeveral of that philoſopher's works into the Latin language. In 1675 Mr. Oldenburg became involved in a diſpute with Mr. Hooke, who complained that juſtice had not been done him in the "Tranſactions," with reſpect to the invention of the ſpiral-ſpring for pocket watches. The diſcuſſion was terminated in favour of Mr. Oldenburg, by a declaration from the council of the Royal Society, "that the publiſher of the Tranſactions had carried himſelf faithfully and honeſtly in the managing the intelligence of the Royal Society, and given no cauſe for ſuch reflections." Mr. Oldenburg continued to publiſh the Philoſophical Tranſactions till the number 136, in the year 1677, after which the publication was diſcontinued, till it was reſumed by Dr. Nehemiah Grew. Mr. Oldenburg died in Auguſt 1678, at the age of fifty-two. He publiſhed numerous tracts, chiefly on theological ſubjects, and tranſlations of the "Prodromus to a Diſſertation concerning Solids naturally contained within Solids, &c. by Nicholas Steno:" of "A Genuine Explication of the Book of Revelations, &c. by A. B. Piganius;" and of "The Life of the Ducheſs of Mazarine."

Oldenburg, in *Geography*, a county of Germany, bounded on the N. by the lordſhip of Jever, on the E. by the county of Delmenhorſt and the Weſer, on the S. by the biſhopric of Munſter, and on the W. by Eaſt Frieſland. This county meaſures 40 miles in length, and ſomewhat more than 30 in breadth, and belongs to the king of Denmark. The ſoil, generally fertile, affords excellent paſturage, and a good breed of horned cattle and horſes. It has, however, much moor-land, which is dug for good turf that is uſed for burning. Large and expenſive dykes and dams ſecure it againſt inundations. Amber has been found in ſome parts of it.—Alſo, the capital of the above county, ſeated on the Hunte, regularly fortified, and containing two churches. The citadel is the reſidence of a governor; 39 miles E.S.E. of Emden. N. lat. 53° 7'. E. long. 8° 15'.—Alſo, a town of Weſtphalia, in the biſhopric of Paderborn, with a fortified caſtle; 16 miles E.N.E. of Paderborn.

OLDENBURGER, Philip-Andrew, in *Biography*, a juriſt and political writer, was ſettled at Geneva, where he taught law and hiſtory with much reputation. He wrote a great number of very learned works, ſeveral of which he publiſhed under borrowed names. One of theſe was Burgoldenſis, which was his real name reverſed with a little variation. The principal of theſe works are, 1. "Notitia Imperii, ſive Diſcurſus ad Inſtrumenta Pacis Oſnaburgo-Monaſtericnſis:" this contains an uſeful liſt of the German

hiſtorians and writers on public law: 2. "Theſaurus Rerum publicarum totius Orbis," in four volumes 8vo., a work which, though imperfect, is uſeful, particularly for the knowledge of modern kingdoms. And 3. "Tractatus de Rebus publicis turbidis in tranquillum ſtatum reducendis." The author died at Geneva in the year 1678.

OLDENDORF, in *Geography*, a town of Weſtphalia, in the principality of Calenberg; 20 miles N.N.W. of Gottingen. N. lat. 51° 47'. E. long. 9° 41'.—Alſo, a town of Weſtphalia, in the county of Schauenburg, on the Weſer. N. lat. 52° 8'. E. long. 9° 20'.

OLDENLANDIA, in *Botany*, a name of Plumier's, in his Nova Genera 42. t. 36, was deſigned to commemorate Henry Bernard Oldenland, there called a German, but who it ſeems was really a Dane. Having imbibed a taſte for botany, under the tuition of Herman at Leyden, he undertook a voyage to the Cape of Good Hope, about the year 1695, for the purpoſe of collecting plants, where he ſoon after died, at an early age. His herbarium came at length into the hands of the Burmann family, and was taken to Upſal by the laſt profeſſor of that name, for the inſpection of Linnæus, who deſcribed from thence many of his Plantæ Africanæ Rariores, in the Amœn. Acad. v. 6.

The original *Oldenlandia* however proving the ſame genus with *Hedyotis*, and the latter name having obtained precedence, we ſhall eſtabliſh a new one, upon three ſpecies very erroneouſly referred to the former, their generic character being eſſentially different from HEDYOTIS; ſee that article, where we have already adverted to this ſubject.—Claſs and order, *Pentandria Digynia*. Nat. Ord. *Succulentæ*, Linn. *Saxifragæ*, Juſſ.

Gen. Ch. *Cal.* Perianth ſuperior, of five equal leaves, permanent. *Cor.* Petals five, alternate with, and ſhorter than, the leaves of the calyx, concave, obtuſe. *Stam.* Filaments five, very ſhort, erect; anthers roundiſh. *Piſt.* Germen inferior, large, globoſe; ſtyles two, rarely but one, ſpreading, the length of the ſtamens; ſtigmas obtuſe. *Peric.* Capſule globoſe, coated, of two confluent cells, opening at the top. *Seeds* numerous, minute, inſerted on two flat orbicular vertical receptacles.

Eſſ. Ch. Calyx of five leaves. Petals five. Capſule inferior, of two cells, with many ſeeds.

Obſ. The parts of fructification are ſo minute, that our imperfect dried ſpecimens do not allow us to ſpeak with preciſion reſpecting the characters of this genus. It ſeems allied to *Vahlia*, but we rather wiſh to ſubmit our remarks to thoſe who may be able to examine the plants alive.

1. O. *dichotoma*. (O. pentandra; Retz. Obſ. faſc. 4. 22. Willd. Sp. Pl. v. 676. Heuchera dichotoma; Murray in Comm. Goett. for 1772. 64. t. 1.)—Stalks two-flowered.—Native of the Eaſt Indies. *Root* annual? rather woody. *Stems* ſpreading, much branched, leafy, round, downy, a foot long. *Leaves* oppoſite, ſeſſile, linear, entire, roughiſh. *Flower-ſtalks* axillary, ſolitary, cloven, two-flowered. *Flowers* ſmall, yelloviſh. *Capſule* ſcarcely ſo large as a hemp-ſeed. *Style*, according to Retzius, ſolitary.

2. O. *ſeſſiliflora*. (O. digyna; Retz. Obſ. faſc. 4. 23. Willd. Sp. Pl. v. 1. 674.)—Flowers axillary, ſeſſile.—Found at Tranquebar, in rice-grounds, during the rainy ſeaſon. *Stems* procumbent, branched. *Leaves* ſeſſile, lanceolate, entire. *Flowers* nearly or quite ſeſſile; whether ſolitary or otherwiſe is not ſaid, and we have ſeen no authentic ſpecimen. *Petals* minute, white. *Styles* two.

3. O. *depreſſa*. Willd. Sp. Pl. v. 1. 675; excluding the citation of Rheede.—Leaves elliptical, ſtalked. Stalks axillary, in pairs, ſingle-flowered.—Native of the Eaſt Indies. *Stems* proſtrate, branched, ſmooth. *Leaves* like thoſe of *Thymus Serpyllum*, elliptical, obtuſe, ſmooth, without rib or veins, unequal, and ſomewhat heart-ſhaped at the baſe. *Calyx* ſmooth.

OLDENZEEL, in *Geography*, a town of Holland, in the department of Overiſſel, the capital of the country of Twente; 40 miles N.W. of Munſter. N. lat. 52° 24'. E. long. 6° 45'.

OLDESLOHE, a town of the duchy of Holſtein, which has ſalt-works; 15 miles W. of Lubeck. N. lat. 53° 50'. E. long. 10° 27'.

OLDHAM, JOHN, in *Biography*, an Engliſh poet of the ſeventeenth century, was born at Shipton, in Glouceſterſhire, in 1653, of which pariſh his father was miniſter. He was educated in grammar learning at Tetbury-ſchool, and in 1670 was entered at St. Edmund's hall, Oxford. After an abode of four years at the univerſity he became uſher of the free-ſchool at Croydon, where he remained three years. The Popiſh plot (ſee the article OATES) induced him to write his four ſatires againſt the Jeſuits. He had previouſly to this made himſelf known as a poet, by the compoſition of ſome pieces that were handed about in manuſcript. One or more of theſe had fallen into the way of the earls of Rocheſter and Dorſet, and ſir Charles Sedley, who were ſo much pleaſed, that they paid the author a viſit while in the humble ſituation at Croydon. Soon after this he removed to the ſeat of ſir Edward Thurland, as tutor to his grandſons. He afterwards undertook the tuition of a ſon of ſir William Hicks, and when he had fitted his pupil for foreign travel, he went to London to cultivate his connections among the poets and men of wit in that city. He was ſoon introduced to Dryden, and obtained the patronage of William, earl of Kingſton, who took him to his ſeat of Holme-Pierepont, where, in December 1683, he died of the ſmall-pox at the age of thirty. The noble earl erected a monument to his memory in the church of that place. His fame as a poet was chiefly obtained by his ſatires, the ſpirited and indignant vein of which gave him the appellation of the Engliſh Juvenal. They are, however, coarſe in their language, and harſh in their verſification, but poſſeſs much vigour of ſtyle and vivacity of deſcription. Of the poems of Oldham, part were publiſhed by himſelf, and the reſt after his death, under the title of "Remains." An edition of the whole, with the author's life, was given in two volumes. Biog. Brit.

OLDHAM, in *Geography*, a market-town and pariſh in the hundred of Salford, and county palatine of Lancaſter, England, is ſituated on a branch of the river Medlock, at the diſtance of ſix miles from Manchеſter. The ground, upon which the greater portion of the town is built, riſes conſiderably above the ſurrounding level, and has conſequently the advantage of commanding an extenſive proſpect. The chief trade here is in the manufacture of hats and of ſtrong fuſtians. Some cotton mills, however, have been eſtabliſhed; and as coals are abundant, the machinery is uſually put in motion by ſteam. The market of Oldham is only of recent conſtitution, as the town is entirely indebted for its preſent extent and importance to its proximity to, and connection with, Manchеſter, which may be regarded as the radiating focus of the cotton trade of this country. Oldham is a parochial chapelry, ſubordinate to Preſtwich, but has a church and a chapel belonging to the eſtabliſhment, beſides ſeveral diſſenting meeting-houſes. According to the population returns of 1811, this town contains 2843 houſes, and 16,930 inhabitants, being an increaſe of 4906 perſons ſince the population report of 1801 was taken. Aikin's Deſcription of the Country from thirty to forty Miles round Manchеſter,

cheſter, 1 vol. 4to. London, 1795. Beauties of England and Wales, vol. ix. by John Britton, F.S.A.

OLDHEAD, or Old Head *of Kinſale*, a cape of Ireland, in the county of Cork, extending to the ſouth and weſt of Kinſale harbour. It was called by the Spaniards "Cabo de Velbo," and is very high and ſteep. N. lat. 51° 37'. W. long. 8° 30'.

OLDISLEBEN, a town of the principality of Weimar, ſeated on a hill near the Unſtrutt; 22 miles N. of Weimar.

OLDMIXON, John, in *Biography*, deſcended from an ancient family in Somerſetſhire, and flouriſhed in the 17th and 18th centuries; he was a violent opponent of the Stuart family, and in the reign of queen Anne attacked the writers of that period with ſo much violence, that Pope gave him a conſpicuous place in the Dunciad. His writings, at a ſubſequent period, obtained him a ſituation under government. He died in 1742. Beſides his fugitive and temporary pieces, he wrote "A Hiſtory of the Stuarts," in folio; "A Critical Hiſtory of England," in two vols. 8vo.; a volume of poems, and ſome dramatic pieces.

OLDNEY, in *Geography*, a ſmall iſland near the W. coaſt of Scotland. N. lat. 58° 12'. W. long. 5° 2'.

OLDYS, William, in *Biography*, an hiſtorical writer, was the natural ſon of Dr. Oldys, chancellor of Lincoln, and advocate of the court of admiralty. Having lived a diſſolute life, and expended what property had been left him, he became keeper of lord Oxford's library, of which he formed the catalogue when that collection was ſold by Oſborne the bookſeller. He was alſo employed to ſuperintend the publication of the Harleian miſcellany. The only public poſt he ever had was that of Norroy, king at arms. He died in 1761, at the age of 74. His principal works are the life of ſir Walter Raliegh; ſome articles in the General Hiſtorical Dictionary; thoſe in the Biographia Britannica ſigned G: the Britiſh Librarian: Introduction to Haywood's Britiſh Muſe, and the Life of Richard Carew, the antiquary.

OLEA, in *Botany*, the celebrated ελαια of the Greeks, whoſe value, on account of its oil, has rendered it famous throughout all antiquity. The word is derived from λειος, *ſmooth*, and alludes probably to the nature and qualities of the oil, for there is no remarkable ſmoothneſs about the plant, except indeed the upper ſurface of its leaves. Linn. Gen. 10. Schreb. 13. add. 816. Willd. Sp. Pl. v. 1. 44. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 21. Brown. Prodr. v. 1. 523. Michaux Boreal-Amer. v. 2. 222. Tournef. t. 370. Juſſ. 105. Lamarck Dict. v. 4. 537. Illuſtr. t. 8. Gærtn. t. 93.—Claſs and order, *Diandria Monogynia*. Nat. Ord. *Sepiariæ*, Linn. *Jaſmineæ*, Juſſ. *Oleinæ*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, ſmall, deciduous, its mouth four-toothed, erect. *Cor.* of one petal, funnel-ſhaped; tube cylindrical, the length of the calyx; limb flat, cloven into four, nearly ovate ſegments. *Stam.* Filaments two, oppoſite, awl-ſhaped, ſhort; anthers erect. *Piſt.* Germen ſuperior, roundiſh; ſtyle ſimple, very ſhort; ſtigma cloven, thickiſh, with emarginate ſegments. *Peric.* Drupa nearly ovate, ſmooth, of one cell. *Seed.* Nut ovato-oblong, rugoſe, generally two-celled.

Obſ. Some ſpecies are now removed from this genus, ſee Notelæa, while *Phillyrea* is by ſeveral botaniſts united to it. See Phillyrea.

Eſſ. Ch. Calyx cloven at the mouth into four, nearly ovate ſegments. Drupa ſuperior, ſingle-ſeeded.

1. O. *europæa*. Common Europæan Olive. Linn. Sp. Pl. 11. Fl. Græc. t. 3. Woodv. Med. Bot. t. 136.—Leaves lanceolate, entire, pale beneath. Cluſters axillary, denſe.—Native of the ſouth of Europe, and cultivated univerſally. It flowers from June to Auguſt. Rather a ſmall, evergreen *tree*, with ſquare, ſpreading, greyiſh *branches*. *Leaves* oppoſite, ſlightly ſtalked, acute, a little revolute, dark green above. *Cluſters* axillary, oppoſite, half as long as the leaves, hoary, on oppoſite, ſhort ſtalks. *Corolla* white. *Drupa* elliptical, violet-coloured, bitter.

Five varieties of this ſpecies are enumerated in the *Hortus Kewenſis*, differing chiefly in the ſhape and direction of their leaves, and, in ſome meaſure, in the value of their fruit. This is unqueſtionably the original ſpecies of *Olea*, which has been held in all ages as the bounteous gift of Minerva to mankind. It has always been conſidered as emblematical of peace and plenty; indeed, it has been remarked, that the great quantity of oil which it produces in ſome countries, effectually realiſes the latter of theſe bleſſings. It is conjectured that the olive came originally from Aſia, being cultivated in moſt parts of Paleſtine, and having actually given a name to the celebrated mount near Jeruſalem.

2. O. *capenſis*. Cape Olive. Linn. Sp. Pl. 11. (Liguſtrum capenſe ſempervirens, folio craſſo ſubrotundo; Dill. Elth. 193. t. 160.)—Leaves ovate, entire. Cluſters panicled, divaricated.—Native of the Cape of Good Hope, flowering from June to September. A ſmall *tree*, or rather *ſhrub*, not much branched, with an erect, blackiſh-brown *trunk* beſet with aſh-coloured dots and lines. *Leaves* in pairs, decuſſated, ſometimes ſinuated at the end, paler underneath, with oblique, ſmooth veins. *Flowers* in axillary, panicled ſometimes pendent cluſters, ſmall and white. There is a variety of this ſpecies figured in Jacquin's Hort. Schoenb. v. 1. t. 2, under the name of *undulata*.

3. O *americana*. American Olive. Linn. Mant. 24. Willd. n. 3. (Liguſtrum lauri folio, fructu violaceo, baccis purpureis; Cateſb. Carol. v. 1. t. 61.)—Leaves elliptic-lanceolate.—Native of Carolina and Florida. It flowers in June. This ſpecies is remarkable for having male and female flowers as well as perfect ones on the ſame plant. It is an evergreen ſhrub, with oppoſite, entire, ſhining, ſtalked *leaves*. *Flowers* in ſhort, axillary, brachiated cluſters, with oppoſite ſtalks. *Nut* obovate, ſomewhat ſtriated, perforated at the baſe.

4. O. *excelſa*. Laurel-leaved Olive. Willd. n. 6. Vahl. Symb. v. 3. 3.—Leaves elliptical, acute. Bracteas perfoliate, the lower cup-ſhaped, permanent; upper large, deciduous.—Native of Madeira, flowering in May. This is a branched *tree* with an aſh-coloured, dotted *bark*. Leaves oppoſite and alternate, attenuated at each end, entire, ſmooth, coriaceous, veinleſs. *Flowers* in axillary, oppoſite, moſtly ſolitary, cluſters. *Corolla* twice as large as in the common olive.

5. O. *cernua*. Drooping Olive. Vahl. Symb. v. 3. 3. Willd. n. 4; excluding the ſynonym of Lamarck.—Leaves elliptic-lanceolate, very blunt. Cluſters axillary, ſimple. Flowers drooping. Tube of the corolla cylindrical.—Gathered in Madagaſcar by Commerſon, one of whoſe ſpecimens is before us. The bark of the young *branches* is of a glaucous grey. *Leaves* ſmaller and blunter than in the laſt. *Flowers* drooping; their tube about one-third of an inch long, cylindrical; limb in four ſpreading triangular ſegments, not half that length; the orifice bearded. *Stamens* four, which circumſtance, added to our ignorance of the *fruit*, renders the genus of this ſpecies at beſt very doubtful. Lamarck's t. 8. f. 2, quoted with heſitation in Willdenow, and perhaps in Vahl, whoſe third volume we have not at hand, is unqueſtionably a very different thing.

6. O. *fragrans*. Sweet-ſcented Olive. Thunb. Jap. 18.

t. 2. Willd. n. 7. Ait. n. 5. (Mokkfei; Kæmpf. Amoen. 844.)—Leaves elliptic-lanceolate, ſerrated. Flower-ſtalks ſimple, ſingle-flowered, axillary, many together.—Native of Cochinchina, China, and Japan, introduced into England in 1771. It is kept in the green-houſe or ſtove, flowering in ſummer, and is valuable for the peculiar and delicious ſcent of the little white *flowers*, which is like that of the higheſt-perfumed green tea. Hence ſuch tea has been reported to be ſcented with theſe flowers; but, as far as we can learn, without foundation. The Chineſe however are ſaid by Kæmpfer to eſteem them very much. The *leaves* of this plant are evergreen, ſhining, rather dark, finely and ſharply ſerrated. *Flowers* not bigger than ſome of the common kinds of *Galium*, pure white at firſt, but turning to a tawny-brown in decay. Thunberg ſpeaks of the *O. fragrans* as a very large tree in Japan. We have ſeen it ten or twelve feet high only, as yet, in England. If brought, while in flower, into an apartment, it will continue for ſome time to perfume the whole houſe, if regularly watered, and ſcreened from chilling blaſts of air.

Olea, in *Gardening*, contains plants of the exotic tree kind, as the olive-tree. The ſpecies cultivated are the common European olive (O. europæa); the Cape olive (O. capenſis); the American olive (O. americana); and the ſweet-ſcented olive (O. fragrans.)

Of the firſt ſort there are ſeveral varieties; as the warted-olive, which is a native of the Cape. The long-leaved, which is chiefly cultivated in the ſouth of France, and from which they make the beſt oil. The young fruit is moſt eſteemed when pickled.

And there are ſeveral ſub-varieties, as the broad-leaved, which is chiefly cultivated in Spain, where the trees grow to a much larger ſize than the preceding: the leaves are much larger, and not ſo white on their underſide; the fruit is near twice the ſize of the Provence olive, but of a ſtrong rank flavour, and the oil is likewiſe ſtrong.

There are alſo other varieties; as the narrow-leaved, ſhort hard-leaved, ſhining-leaved, African, Lucca, &c.

It may be obſerved, that the olive ſeldom becomes a large tree; but two or three ſtems frequently riſe from the ſame root, from twenty to thirty feet high, putting out branches almoſt their whole length, covered with a grey bark; the leaves are ſtiff, about two inches and a half long, and half an inch broad in the middle, gradually diminiſhing to both ends, of a lively green on their upper ſide and hoary on their under, ſtanding oppoſite; the flowers are produced in ſmall axillary bunches; they are ſmall, white, and have ſhort tubes ſpreading open at top; the firſt is a ſuperior-berried drupe, of an oblong ſpheroidal form, and of a yellowiſh-green colour, twining black when ripe.

*Preparing the Oil.*—The uſual method of making oil from olives in Italy is, to cruſh the fruit to a paſte with a perpendicular mill-ſtone running round a trough; which is then put into flat round baſkets, made of ruſhes, piled one upon another under the preſs; after the firſt preſſure, ſcalding water is poured into each baſket, its contents ſtirred up, and the operation repeated till no more oil can be ſkimmed off the ſurface of the tubs beneath; but this is not a good method; the oil is ſeldom pure, keeps ill, and ſoon grows rancid; but by another proceſs, which is that of pounding the fruit in a mortar, the cruſhed ſubſtance being then thrown into a long woollen bag, and rubbed hard upon a ſloping board, and then wrung, adding afterwards hot water, and continuing to preſs as long as a drop of oil can be drawn, the work is much more effectually performed. See Oil.

The difference in the kind of olive produces a difference in the oil; but concurring circumſtances occaſion other differences. If the olive be not ſufficiently ripe, the oil is better; if it be too ripe, the oil is thick and glutinous. The method of extracting the oil has alſo a very great influence on its quality. The oil-mills are not kept ſufficiently clean; the mill-ſtones, and all the utenſils, are impregnated with a rancid oil, which muſt inevitably communicate its flavour to the new oil. In ſome countries it is uſual to lay the olives in heaps, and ſuffer them to ferment before the oil is drawn. By this management the oil is bad; and this proceſs can only be uſed for oil that is intended for the lamp, or for the ſoap-boiler.

The unripe olives, when pickled, eſpecially the Provence and Lucca ſorts, are to many extremely grateful, and ſuppoſed to excite appetite and promote digeſtion. According to Miller, they are prepared by repeatedly ſteeping them in water; to which ſome add alkaline ſalt or quick lime, in order to ſhorten the proceſs; after which they are waſhed, and preſerved in a pickle of common ſalt and water, with ſometimes the addition of an aromatic.

In ſome places, ſays Chaptal, they are macerated in boiling water, charged with ſalt and aromatics; and, after 24 hours digeſtion, they are ſteeped in clear water, which is renewed till their taſte is perfectly mild. Sometimes nothing more is done than to macerate the olives in cold water; but they are frequently macerated in a lixivium of quick-lime and wood-aſhes, after which they are waſhed in clear water. But in whatever manner the preparation is made, they are preſerved in a pickle charged with ſome aromatic plant, ſuch as coriander and fennel. Some perſons preſerve them whole, others ſplit them, for the more complete extraction of their mucilage, and in order that they may be more perfectly impregnated with the aromatics. All theſe proceſſes evidently tend to extract the mucilaginous principle, which is ſoluble in water, and by theſe means to preſerve the fruit from fermentation. When the operation is not well performed, the olives ferment and change. If olives be treated with boiling water, to extract the mucilage, before they are ſubmitted to the preſs, a fine oil will be obtained, without danger of rancidity. When the oil is made, if it be ſtrongly agitated in water, the mucilaginous principle is diſengaged; and the oil may be afterwards preſerved for a long time without change. Chaptal ſays, that he has preſerved the oil of the marc of olives, prepared in this manner, for ſeveral years, in open bottles, without any alteration. Chaptal's El. of Chem. vol. iii.

It is ſaid, that when the olives are put into thoſe ſmall barrels, in which they are brought to us, they give them a flavour by throwing over them an eſſence uſually compoſed of cloves, cinnamon, coriander, and fennel. But this eſſence is a kind of ſecret with thoſe who deal in them; and it is in this that the whole difficulty of the preparation is ſaid to conſiſt.

The beſt ſalad oil is of a bright pale amber colour, bland to the taſte, and without the leaſt ſmell.

It has been obſerved, that with a little protection in ſevere froſt, the olive-tree may be maintained againſt a wall about London, but that in Devonſhire there are ſome of theſe trees which have grown in the open air many years, and are ſeldom injured by froſt, yet the ſummers are not warm enough to bring the fruit to any great perfection.

*Method of Culture.*—In Languedoc and Provence, where the olive-tree is greatly cultivated, they propagate it by truncheons, ſplit from the roots of the trees; for as theſe trees are frequently hurt by hard froſts in winter, ſo when the tops are killed, they ſend up ſeveral ſtalks from the root; and when theſe are grown pretty ſtrong, they ſeparate them with an axe from the root; in the doing of which they



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are careful to preſerve a few roots to the truncheons; theſe are cut off in the ſpring after the danger of the froſt is over, and planted about two feet deep in the ground, covering the ſurface with litter or mulch, to prevent the ſun and wind from penetrating and drying the ground; when the plants have taken new root, they are careful to ſtir the ground, and deſtroy the weeds.

Theſe trees will grow in almoſt any ſoil, but when they are planted in rich moiſt ground, they grow larger and make a finer appearance than in poor land; but the fruit is of leſs eſteem, becauſe the oil made from it is not ſo good as that which is produced in a leaner ſoil. The chalky ground is eſteemed the beſt for theſe trees, and the oil which is made from the trees growing in that ſort of land is much finer, and will keep longer than the other.

In the countries where the inhabitants are curious in the making of their oil, they are frequently obliged to get truncheons of the ordinary ſorts of olives to plant; but after they have taken good root, they graft them with that ſort of olive which they prefer to the others. In Languedoc, they chiefly propagate the cormeau, the ampoulan, and moureau, which are three varieties of the firſt ſpecies, or Provence olive with a ſmaller oblong fruit; but in Spain the ſecond ſort, or Spaniſh olive with the largeſt fruit, is generally cultivated, where they have more regard to the ſize of the fruit, and the quantity of oil they will produce, than to their quality.

Theſe plants may be propagated in this climate by layers, which ſhould be made from the young branches in the ſpring, in the uſual manner, and be occaſionally watered during the ſummer ſeaſon, when in the autumn following they may be taken off and be planted in ſeparate pots, being duly watered and placed in proper ſhade till freſh rooted, removing them in the beginning of the autumn into the ſhelter of the greenhouſe. The layers ſometimes, however, require two ſummers before they become perfectly rooted. But it is, notwithſtanding, the beſt method to purchaſe plants of this ſort, which are annually ſent to the Italian warehouſemen in London, of pretty large ſizes, with orange and other trees, as they are very tedious in raiſing from layers.

Theſe plants, after being thus procured, and cleaned from filth by ſoaking their roots in water, ſhould be planted in pots filled with freſh ſandy light earth, plunging them in a moderate hot-bed, ſhading them in the hot ſun, and refreſhing them occaſionally with ſlight waterings as the earth in the pots becomes dry. When they begin to ſhoot they ſhould have air admitted pretty freely in proportion to the weather, being afterwards inured to the open air in a place defended from winds, removing them in the beginning of autumn into the green-houſe. And after they have in this management acquired ſtrong roots, they may be removed with earth about them, and be planted out in the open ground in a dry warm ſituation, being managed as myrtles and other ſimilar plants. When covered by mats in the winter froſt, great care muſt be taken to prevent their becoming mouldy, by not letting them remain covered too long, without the air being admitted.

They flower and produce fruit ſometimes in two or three years.

Theſe plants all afford variety among others of the greenhouſe kind, as well as in other ſituations.

Olea is alſo the name of a ſtone deſcribed by Ludovicus Dulcis, and ſome other ſuch authors, who attribute great virtues to it, and ſay it was variegated with ſeveral colours, as yellow, black, white, green, &c. It ſeems to have been ſome one of the common agates, to which their ignorance had prompted them to give a new name.

OLEAGINOUS, ſomething that partakes of the nature of oil; or out of which oil may be expreſſed.

Thus olives, nuts, almonds, &c. are oleaginous fruits, or fruits out of which oil is expreſſed.

Pines, firs, &c. are oleaginous woods, yielding reſin, turpentine, &c. Of all woods, oleaginous ones burn the beſt.

OLEANDER, or Rose-bay, in *Botany*. See Nerium.

OLEARIUM, in *Natural Hiſtory*, a ſpecies of *Buccinum*.—Alſo, a ſpecies of *Murex*; which ſee.

OLEARIUS, a ſpecies of *Turbo;* which ſee.

Olearius, Adam, in *Biography*, a learned German, was born in 1603, at Aſherleben, in Lower Saxony. He was for ſome time a profeſſor at Leipzic, which office he quitted for a place in the ſervice of Frederic, duke of Holſtein-Gottorp. The prince had a plan of bringing a ſhare of the commerce of the Levant to his new town of Frederickſtadt, and for that purpoſe ſent an embaſſy to the czar of Muſcovy, and the king of Perſia, which embaſſy Olearius joined in the quality of ſecretary and counſellor. The miſſion continued ſix years, *viz.* from 1633 to 1639; and Olearius drew up an account of the journey in the German language, printed at Sleſwick in 1656 and 1671, accompanied with figures deſigned by himſelf. It is a curious and highly eſteemed work, and has been tranſlated into ſeveral languages. Upon his return, Olearius took up his reſidence at Gottorp, and was appointed librarian, antiquary, and mathematician to the duke. He died in 1671. He was very learned in mathematics; a ſkilful muſician; and a proficient in the oriental languages, eſpecially in the Perſian. He was author of many other works, as "The Valley of Perſian Roſes, a Collection of pleaſant Stories, ingenious Sayings, and uſeful Maxims, by the Poet Shach-Saadi, tranſlated into German;" "A Narrative of a Voyage to the Indies, by Albert de Mandeſlo, with Remarks;" "An abridged Chronicle of Holſtein, from 1448 to 1663;" "The Gottorp Cabinet of Curioſities." Moreri.

Olearius, Godfrey, a learned German Lutheran divine in the ſeventeenth century, was born at Halle, in Saxony, in the year 1604. He was educated for the church, and became paſtor of St. Ulric's church, in his native city. After this he was created doctor of divinity, appointed paſtor of St. Mary's, and was nominated ſuperior and inſpector of the Lutheran Gymnaſium; and finally made ſuperintendant of the churches in the duchy of Magdeburg by the elector of Brandenburg. He died in 1685, at the age of eighty-one. He was author of ſeveral theological works, among which were "A Life of Chriſt, from the four Evangeliſts;" and "An Explication of the Book of Job." Moreri.

Olearius, Godfrey, grandſon of the laſt, was born at Leipſic in the year 1672. When he had completed his academical courſe he went to Holland, and from thence to England, for farther improvement. Upon his return to Leipſic in 1699, he obtained a profeſſorſhip of the Greek and Latin languages; an office which he filled with diſtinguiſhed ability till the year 1708, when he was appointed to the theological chair. He obtained other conſiderable offices, and died in 1715, leaving behind him many works that teſtify to his induſtry and talents; among theſe were "An Introduction to the Roman and German Hiſtories;" a Latin verſion of "The Hiſtory of the Apoſtles' Creed," from the Engliſh of ſir Peter King; a Latin verſion of "Stanley's Hiſtory of Philoſophy," and ſeveral theological works of conſiderable merit. The father of this perſon, *viz.* John Olearius, was born at Halle in 1639, was alſo diſtinguiſhed for his literary acquirements, and was one of the firſt who engaged with Carpzovius, Alberti, and Lotigius

gius in furniſhing contributions to the "Leipſic Acts." He was created doctor of divinity, and was ten times raiſed to the dignity of rector. He died in 1713. Moreri.

O'LEARY, Arthur, an eminent Catholic prieſt of the laſt century, was born in the city of Cork. He was ſent to France at an early age, and purſued his ſtudies at the college of St. Malo's in Britanny, after which he entered into the Franciſcan order of Capuchins. When he had finiſhed his ſtudies, he was appointed chaplain to a regiment of his countrymen in the ſervice of the French king, an office which he ſoon gave up, and returned to his native country. By the aſſiſtance of ſome friends he built a ſmall chapel in his native city, in which he officiated. While employed in the duties of his profeſſion, he combated a work at that time publiſhed in Cork, entitled "Thoughts on Nature and Religion," and with the leave of the biſhop of his dioceſe, he publiſhed a piece in juſtification of his own creed, in oppoſition to the dogmas of his antagoniſt, entitled "A Defence of the Divinity of Chriſt, and the Immortality of the Soul." Shortly after this, when the parliament of Ireland ſhewed a diſpoſition to relax the rigour of the penal laws againſt the Roman Catholics, and framed a ſort of teſt oath, to be adminiſtered to ſuch of them as ſhould claim the benefit of acts paſſed in their favour in the year 1782, many perſons heſitated about the propriety of taking it. On this occaſion Mr. O'Leary publiſhed a tract entitled "Loyalty aſſerted, or the Teſt-oath vindicated," in which he explained the ſeeming difficulties that occurred ſo much to the ſatisfaction of his Catholic countrymen, that they almoſt unanimouſly complied with the proviſion of the legiſlature. Theſe publications were highly applauded, and obtained for the author many friends among the liberal and enlightened, but at the ſame time they excited againſt him the envy and jealouſy of prieſts, who poſſeſſed neither the ſpirit nor the talent to act in the ſame manner. He enjoyed his triumph, and having ſhewn that the Roman Catholics of Ireland might, conſiſtently with their religion, ſwear that the pope poſſeſſed no temporal authority or juriſdiction in that kingdom, he became the favourite and friend of almoſt all the eminent Iriſh political and literary characters. At this critical period, when the combined fleets of France and Spain inſulted the Britiſh coaſt, and threatened an invaſion of Ireland, he addreſſed his Catholic countrymen in the moſt energetic language, in the cauſe of order and loyalty, and with ſuch effect as to merit the thanks of the government. He was equally ſucceſsful, not only in quelling thoſe inſurgents who had attacked the tythe-proctors of the Proteſtant clergy, but in bringing them to a ſenſe of their miſconduct. This occaſioned an attack upon himſelf from Dr. Woodward, the Proteſtant biſhop of Cloyne, which he repelled in "A Defence of the Conduct and Writings of the Rev. Arthur O'Leary, &c. written by himſelf, in Anſwer to the ill-grounded Inſinuations of the Right Rev. Dr. Woodward." This defence, publiſhed in 1788, is a maſter-piece of wit, argument, irony, and energetic writing, and yet was drawn up in leſs than eight hours. His antagoniſt on this occaſion acknowledged, that O'Leary repreſents matters "ſtrongly and eloquently," and that, "Shakſpeare-like, he is well acquainted with the human heart." Soon after this he left Ireland, and came to London, where he reſided for many years as principal miniſter of the Roman Catholic chapel in Soho-ſquare: here he was highly eſteemed, and extremely well attended by perſons of his own perſuaſion. In this place he pronounced, in the year 1800, a funeral oration on pope Pius VI., before a vaſt concourſe of Engliſh nobility, and foreigners of high rank. He died at an advanced age in the month of January 1802, and was attended to his grave at St. Pancras church by many thouſands of the Catholics, by whom he was highly reſpected, as well for his ardent piety as for his impreſſive manner as a preacher. As a writer, his ſtyle is fluent, bold, and figurative; but deficient in grace, perſpicuity, and ſometimes grammar. His higheſt praiſe, however, ariſes from his having been a diſtinguiſhed friend to freedom, on which account he was frequently complimented by Meſſrs. Grattan, Flood, and other diſtinguiſhed members of the Iriſh parliament, in their public ſpeeches. He was author of many works beſides thoſe already referred to. His "Miſcellaneous Tracts" form one volume 8vo. For farther particulars, the reader may conſult the Monthly Magazine for March 1802.

OLEASTER, Jerome, a learned Portugueſe monk, who flouriſhed in the ſixteenth century, was probably a native of Azambuja, a town on the banks of the Tagus. In the year 1520, he took the habit of the Dominican order in a monaſtery at Liſbon, and ſoon acquired the character of an excellent philoſopher, a ſound divine, and a perfect maſter of the Latin, Greek, and Hebrew languages. Above all, he had the reputation of being moſt intimately converſant with the ſacred ſcriptures. In 1545 he was one of the divines whom John III. king of Portugal, ſent to aſſiſt on his behalf at the council of Trent. Upon his return, he was nominated biſhop of St. Thomas' in Africa, but he declined accepting that dignity. He was afterwards appointed to the office of "Inquiſitor," and filled the various offices of truſt and honour in that province of his order. He died in the year 1563. He was author of "Commentaries" on many parts of the ſcriptures, but the work by which he is chiefly known is entitled "Hieronymi ab Oleaſtro Commentarii in Pentateuchum," which was publiſhed in the years 1556—8, in five parts, forming together a folio volume. This edition is very rare, and much ſought after by collectors, owing to the circumſtance of its not having been ſubjected to the examination of the inquiſitorial office. It has paſſed through ſeveral other editions. His Commentary on Iſaiah was firſt publiſhed at Paris in 1623. Moreri and Gen. Biog.

Oleaster, in the *Materia Medica*, the name of the ſallow thorn, or ſea buckthorn, the rhamnoides ſalicis folio of botanical authors.

OLEASTRUM, in *Ancient Geography*, a town of Spain, on the route from Tarragona to Tortoſa; ſituated on the ſea-coaſt, in the country of the Coretani, S.W. of Tarraco.

OLECRANON, in *Anatomy*, a proceſs of the ulna, which forms the prominence of the elbow. See Extremities.

Olecranon, *Fractures of*. See Fractures.

OLEFIANT Gas. This is an inflammable gas, compoſed of carbon and hydrogen. It burns with a brilliant flame. This gas is formed during the burning of wax and ſpermaceti oil, which accounts for the brilliant light afforded by thoſe combuſtible bodies. When we recollect the great denſity of this gas, we are not ſurpriſed at its brilliant flame. Although only one-ſixth of it is hydrogen, yet that is as condenſed as to give a light, the denſity of which is to that of hydrogen as 12.5.

Mr. Dalton has determined the weight of the atom of this gas to be 6.4, being an atom of carbon 5.4 with an atom of hydrogen 1. See *Olefiant Gas* under Carbon, and Gas.

OLEGOU, in *Geography*, a cape of Ruſſia, in the ſea of Ochotſk; 252 miles E. of Ochotſk. N. lat. 59° 20'. E. long. 151° 14'.

OLEINÆ, in *Botany*, a natural order of plants, ſeparated by Mr. R. Brown, after Hoffmanſegg and Link, from the

the *Jaſmineæ* of Juſſieu, and including *Chionanthus*, *Olea*, *Phillyrea* (by ſome united to *Olea*) and *Notelæa*. We do not ſee the grounds of the above ſeparation. See JASMINEÆ and NOTELÆA.

OLEKMA, in *Geography*, a river of Ruſſia, which riſes in the mountains on the frontiers of China, in N. lat. 49°, and flowing due north, enters the Lena, oppoſite to Olekminſk.

OLEKMINSK, a town of Ruſſia, on the Lena, at its junction with the Olekma, in the government of Irkutſk. N. lat. 60° 25′. E. long. 119° 14′.

OLEN, in *Biography*. See OLENUS.

OLENEI, in *Geography*, a cape of Ruſſia, at the W. ſide of the mouth of the Obſkaia gulf, in the Karſkoi ſea. N. lat. 72° 15′. E. long. 72° 22′.

OLENEI *Nos*, a cape of Ruſſia, in the White ſea; 60 miles N. of Archangel.

OLENEK, a town of Ruſſia, at the mouth of the river Olenek, near the Frozen ocean. N. lat. 72° 24′. E. long. 114° 14′.—Alſo, a river of Ruſſia, which riſes in N. lat. 67° 20′, and runs into the Icy ſea, N. lat. 72° 30′. E. long. 104° 14′.

OLENI, a town of Poland, in the palatinate of Braclaw; 52 miles N.W. of Braclaw.

OLENKA, a river of Ruſſia, which runs into the Tungunſka, N. lat. 58° 6′. E. long. 95° 14′.—Alſo, a river of Ruſſia, which runs into the Vitim, N. lat. 55° 30′. E. long. 115° 54′.

OLENOS, in *Ancient Geography*, a town of Achaia, towards the N.W. near the mouth of the river Melas; ſuppoſed to be the preſent "Caminitza."

OLENSKOI, in *Geography*, a town of Ruſſia, in the government of Archangel, on the Vokſcha; 120 miles E. of Archangel.

OLENUM, in *Ancient Geography*, a town of Peloponneſus, in Achaia, between Patræ and Dyme.

OLENUS, in *Biography*, a Greek poet, older than Orpheus, came from Xauthe, a city of Lycia. He compoſed ſeveral hymns, which were ſung in the temple of Delos upon feſtival days. Olenus has the reputation of being one of the founders of the oracle at Delphi, and he is ſaid to have been the firſt who filled, at that place, the office of prieſt of Apollo, and to have given reſponſes in verſe.

OLEOSUM *Sal Volatile*. See SAL.

OLEOUT, in *Geography*, a river of America, in New York, which runs into the E. branch of the Suſquehannah.

OLERON, a town of France, in the department of the Lower Pyrenees, and chief place of a diſtrict; 10 miles W. of Tarbe. The place contains 5158, and the canton 13,977 inhabitants, on a territory of 140 kiliometres, in 19 communes. N. lat. 42° 10′. W. long. 0° 32′.—Alſo, a town of France, in the department of the Lower Charente, on the E. coaſt of the iſland of Oleron; 15 miles S. of La Rochelle. N. lat. 45° 33′. W. long. 1° 6′.—Alſo, an iſland in the Atlantic, near the W. coaſt of France, 5½ leagues long and from one to two wide; ſeparated from the continent by a narrow channel, called "Pertuis de Maubuſſon," and from the iſland of Ré by the "Pertuis de Antioche." The inhabitants, eſtimated at 12,000, are diſtributed in the town of Oleron and ſeveral villages. The ſoil is fertile; but moſt of the occupiers are ſeamen. It was formerly in the poſſeſſion of the crown of England, and has been famous for the laws mentioned in the next article. N. lat. 45° 46′. W. long. 1° 11′.

OLERON, *Laws of*. The inhabitants of the iſland of Oleron have been able mariners for ſeven or eight hundred years paſt; ſo that they framed and drew up the laws of the navy or marine, which are ſtill called the laws of Oleron. According to the French writers theſe maritime laws were digeſted in the fore-mentioned iſland under the title of "Reole des jugemens d'Oleron," by direction of queen Eleanor, the wife of Henry II., in her quality of ducheſs of Guienne, and afterwards enlarged and improved by her ſon Richard I. But Selden (De Dominio Maris, c. 14.) denies this, and maintains that theſe laws were compiled and promulgated by Richard I., as king of England. See USES *and cuſtoms of the ſea*.

Theſe laws, being accounted the moſt excellent ſea-laws in the world, are recorded in the Black Book of the Admiralty.

OLES, in *Geography*, a town of Iſtria; 16 miles N.W. of Pedena.

OLESA, a town of Spain, in the province of Catalonia; 16 miles N.W. of Barcelona.

OLESKO, a town of Poland, in the palatinate of Belcz; 36 miles S.E. of Belcz.

OLESNICK, a town of Poland, in the palatinate of Sandomirz; 28 miles W. of Sandomirz.

OLETTA, a town of the iſland of Corſica; 6 miles S.W. of Baſtia. N. lat. 42° 33′. E. long. 9° 30′.

OLETTE, a town of France, in the department of the Eaſt Pyrenees, and chief place of a canton, in the diſtrict of Prades; 7 miles S.W. of Prades; celebrated for its warm baths. The place contains 1000, and the canton 5361 inhabitants, on a territory of 385 kiliometres, in 24 communes.

OLEVITO, LA, a town of Naples, in Principato Citra; 23 miles E. of Salerno.

OLEUM, OIL. See OIL.

OLEUM *Medicum*, in the *Writings of the Ancients*, a name given to a famous oil which had a quality of burning under water, in ſpite of all that could be done to quench it. It was called *Medicum*, becauſe of its being produced among the Medes, and ſome have called it *oleum Medeæ*, becauſe it was ſuppoſed to be that ſubſtance with which Medæa anointed the crown of her rival. Ammianus Marcellinus tells us, that if an arrow was anointed with this oil, and ſhot out of a bow againſt any inflammable ſubſtance, the whole immediately took fire, and, if any one attempted to quench the flames by water, they only burnt the more fiercely for it. The *venenum Pharicum* of Nicander is ſuppoſed to be the ſame with this oil.

OLEUM *Medeæ*, a name given by the ancients to the mineral fluid, more generally known by that of *naphtha*.

OLEUM *Vitri Antimonii*, in *Medicine*, a name given by Baſil Valentine, and others, to a famous preparation of antimony, which they keep as a ſecret, or at leaſt declare in ſuch terms as are unintelligible, and boaſt of, as the univerſal medicine. The learned Kerkring has given the proceſs for making this red oil of the glaſs of antimony, but that in ſo enigmatical a manner, that he ſeems himſelf not to expect any body to underſtand him; and only ſays, in his own juſtification, that he has given it in plainer terms than any body had done before him. The author relates many wonderful things of this diaphoretic oil, on his own experience; particularly, the curing a confirmed dropſy, by throwing off the water by ſweat; ſo that the patient, in a manner, ſwam in it, and the drops run through the bed, in all parts, to the floor. It were well if we could underſtand the proceſs.

OLEWSKO, in *Geography*, a town of Poland, in the palatinate of Brzeſc; 88 miles E.S.E. of Pinſk.



Strahan and Preſton,
New-Street Square, London.

OLFACTORIUS NERVUS, in *Anatomy*, the nerve of the firſt pair, which is diſtributed in the noſe, and in which the ſenſe of ſmelling reſides. See NERVE.

OLGSKOI, in *Geography*, a town of Ruſſia, in the government of Olonetz, ſeated on the Latcha lake; 12 miles S. of Kargopol.

OLHOH, a town of Arabia, in the province of Hedſjas; 66 miles S.S.E. of Mecca.

OLIANA, a town of Spain, in the province of Catalonia; 7 miles N.W. of Solſona.

OLIAPOUR, a town of Bengal, capital of the circar of Baharbund; 195 miles N.N.E. of Calcutta. N. lat. 25° 22′. E. long. 89° 42′.—Alſo, a town of Hindooſtan, in Dowlatabad; 20 miles N.W. of Darore.

OLIAROS, in *Ancient Geography*, a ſmall iſland in the number of the Cyclades, ſituated near to and W. of Paros, ſaid to be a colony of Sidonians.

OLIAS, in *Geography*, a ſmall, but very agreeable, town of Spain, on the road from Madrid to Toledo, two leagues from the latter place. It is the only place in this route which affords any fruit-bearing trees.

OLIBA, in *Ancient Geography*, a town of Spain, in the Tarragonenſis, and in the country of the Bærones.

OLIBANUM, in *Pharmacy*, a kind of gum reſin, uſually called *male* FRANKINCENSE; which ſee.

It has its name *olibanum, quaſi oleum Libani;* becauſe diſtilled in form of an oil, from the bark of a tree growing on mount Lebanon: the *Juniperus Lycia*. It is collected chiefly in Arabia, and imported in cheſts and caſks from the Levant. Its ſpecific gravity is 1.173. Diſtilled alone it affords a volatile oil; but in conjunction with water or alcohol no oil comes over. Alcohol diſſolves three-fourths of it: after trituration with water and depoſition of the reſinous matter, three-eighths remain diſſolved: ether takes up more than one-half, leaving after evaporation in water a very pure tranſparent reſin; and the undiſſolved part, becoming white and opaque, is almoſt entirely ſoluble in water, forming a milky ſolution. Hence olibanum appears to conſiſt of reſin, gum, and a volatile oil. For its other properties and uſes, ſee FRANKINCENSE.

OLIBATO, or LIBATTA, in *Geography*, a river of Africa, which runs into the ſea, E. of Cape Lopez Gonſalvo, forming a bay at its mouth. This river is ſaid to abound with crocodiles.—Alſo, a town of Africa, in Lower Guinea, on the above-named river, containing about 300 houſes; 36 miles E. of Cape Lopez Gonſalvo. S. lat. 1°. E. long. 10° 54′.

OLICANA, in *Ancient Geography*, a town of the iſle of Albion, in the country of the Brigantes, which was ſituated at Ilkley, on the river Wherſe, in Yorkſhire.

OLIFANT'S, OLIPHANT'S, or *Elephant River*, a river of Africa, on the weſtern coaſt of the Cape of Good Hope, which, after collecting the ſtreamlets of the firſt chain of mountains in its northerly courſe along their feet, diſcharges itſelf into the Southern Atlantic, S. lat. 31° 30′. The navigation of this river is impeded by a reef of rocks acroſs its mouth. Olifant's river, which is a fine clear ſtream, flowing through a narrow valley, hemmed in between the great chain of mountains and an inferior ridge called the "Cardouw," forms one of the diviſions of the diſtrict of Stellenboſch and Drakenſtein. This valley, being interſected by numerous rills of water from the mountains on each ſide, is extremely rich and fertile; but the great diſtance from the Cape, and the bad roads over the Cardouw, preſent little encouragement for the farmer extending the cultivation of grain, fruit, or wine, beyond the neceſſary ſupply of his own family. Dried fruit is the principal article they ſend to the market, after the ſupplies which they furniſh, of horſes, horned cattle, and ſheep. The country on each ſide of the lower part of the river is dry and barren, and for many miles from the mouth entirely uninhabited. A chalybeate ſpring of hot water, of the temperature of 108° of Fahrenheit's ſcale, flows in a conſiderable ſtream out of the Cardouw mountain into the Olifant's river; and a bathing-houſe is erected over the ſpring. All the ſmaller kinds of antelopes, jackalls, hares, and partridges are very abundant in this and the adjoining diviſions of Stellenboſch and Drakenſtein. Barrow's Africa, vol. ii.

OLIGACTIS, in *Natural Hiſtory*, a name given by Linnæus, and others, to a genus of ſtar-fiſh, conſiſting of thoſe which have fewer than five rays.

OLIGAEDRA, the name of a genus of cryſtals.

The word is derived from the Greek ολιγος, *a few*, and εδρα, *a plane*, or *ſide*, and expreſſes a cryſtal, which is compoſed of only a few planes.

The bodies of this claſs are cryſtals of the imperfect kind, being compoſed of columns affixed irregularly to ſome ſolid body at one end, and, at the other, terminated by a pyramid; but the column and pyramid being both pentangular, the whole conſiſts only of ten planes, not, as the common kind, of twelve.

OLIGARCHY, formed from ολιγος, *few*, and αρχη, *government*, a form of government, wherein the adminiſtration is in the hands of a few perſons.

The ſtates of Venice and Genoa may be ranked among oligarchies.

Oligarchy amounts to much the ſame thing with ariſtocracy; unleſs perhaps the former imports a kind of defect or corruption; as if the ſovereign power were monopolized by a few perſons, in prejudice of the rights of a great number.

OLIGARRHENA, in *Botany*, ſo named by Mr. Brown, from ολιγος, *few*, and αρρην, *a male*, becauſe of the ſtamens being but two, though uſually, in the natural order to which the plant belongs, they are five.—Brown Prodr. Nov. Holl. v. 1. 549.—Claſs and order, *Diandria Monogynia*. Nat. Ord. *Epacrideæ*, Brown.

Eſſ. Ch. Calyx in four deep ſegments, with two ſcales at the baſe. Corolla four-cleft, its ſegments not imbricated in the bud, permanent. Stamens within the tube. Germen of two cells. Capſule? of two cells.

1. O. *micrantha*. Gathered by Mr. Brown on the ſouthern coaſt of New Holland. A ſmall, upright, much branched *ſhrub*. *Leaves* ſcattered, imbricated, minute. *Spikes* terminal, erect. *Flowers* ſmall, white, with four ſcales, or nectaries, under the *germen*.

A paradoxical plant, in its artificial characters not much unlike the natural order of *Oleinæ*, but in habit totally different. *Br.*

OLIGOTROPHEROS, among the Greeks, a name given to the finer ſort of bread made of the fineſt flour.—They called it by this name becauſe of the little ſhare of nouriſhment it conveyed; and by way of diſtinction from it, called the brown bread *polytropheros*, or *much nouriſhing*.

OLIKA, in *Geography*, a town of Poland, in Volhynia; 23 miles N.E. of Lucko.

OLIKAN, a ſmall iſland of Ruſſia, in the Penzinſkoi ſea. N. lat. 60° 16′. E. long. 155° 36′.

OLIL, a town of Africa, in Calbari, on the Rio del Rey. N. lat. 4° 15′.

OLIMPIA, a town of European Turkey, in the Morea; 32 miles S.S.E. of Chiarenza.

OLIMPO,

OLIMPO, a mountain of European Turkey, in Theſſaly; 10 miles N. of Lariſſa —Alſo, a mountain of Aſiatic Turkey, in Natolia; 50 miles N.W. of Kintaja.

OLINA, in *Ancient Geography*, a town of Spain, in the Tarragonenſis, ſituated in the interior of the country of the people called Callaici Lucenſci. Ptolemy.

OLINDA, in *Geography*. See FERNAMBUCO.

OLIO, or OGLIO, a ſavoury diſh, or food, compoſed of a great variety of ingredients; chiefly found at Spaniſh tables.

The forms of olios are various. To give a notion of the ſtrange aſſemblage, we ſhall here add one from an approved author.

Take rump of beef, neats tongues boiled and dried, and Bologna ſauſages; boil them together, and, after boiling two hours, add mutton, pork, veniſon, and bacon, cut in bits; as alſo turnips, carrots, onions, and cabbage, borage, endive, marigolds, ſorrel, and ſpinach; then ſpices, as ſaffron, cloves, mace, nutmeg, &c. This done, in another pot put a turkey or gooſe, with capons, pheaſants, wigeons, and ducks, partridges, teals, and ſtock-doves, ſnipes, quails, and larks, and boil them in water and ſalt. In a third veſſel, prepare a ſauce of white wine, ſtrong broth, butter, bottoms of artichokes, and cheſnuts, with cauliflowers, bread, marrow, yolks of eggs, mace, and ſaffron: laſtly, diſh the olio, by firſt laying out the beef and veal, then the veniſon, mutton, tongues, and ſauſages, and the roots over all; then the largeſt fowls, then the ſmalleſt, and laſtly pour on the ſauce.

OLIPHANTS, in *Geography*, a town of America, in North Carolina; 20 miles W. of Saliſbury.

OLISI, a town of Hindooſtan, in the Carnatic; 8 miles N.E. of Ongoli.

OLISIPO, in *Ancient Geography*, now *Liſbon*, a town of Hiſpania, in Luſitania, near the mouth of the Tagus. This town was a Roman colony, with the epithet of "Felicitas Auguſta." See LISBON.

OLISTHEMA, from ολισθαινω, *to fall out*, in *Surgery*, a diſlocation, or luxation.

OLITA, in *Geography*, a town of Mexico, in the province of Xaliſco.—Alſo, a town of Lithuania, in the palatinate of Troki; 28 miles S.W. of Troki.—Alſo, a town of Spain, in Navarre, containing, in its preſent reduced ſtate, four churches and two convents; 20 miles S. of Pamplona. N. lat. 43° 30'. W. long. 1° 42'.

OLITORY, a kitchen garden, or a garden of herbs, roots, &c. for food. See GARDEN, SALLET, &c.

OLIVA, GIOVANNI, in *Biogr phy*, a learned antiquary, was born at Rovigo, in the Venetian territory. He embraced the eccleſiaſtical profeſſion, and was ordained prieſt in 1711. His literary reputation cauſed him immediately after to be nominated profeſſor of the belles lettres at Azzolo, which poſt he occupied about eight years. In 1718 he publiſhed at Venice a very learned treatiſe, entitled "De Antiqua in Romanis ſcholis Grammaticorum diſciplina." He was invited to Rome, in 1719, by pope Clement XI., and appeared with diſtinction among the learned men of that capital. On the diſcovery of a four-footed iſis among ſome ruins, he wrote a Latin diſſertation upon it, in which he diſplayed much erudition reſpecting Egyptian mythology. In 1722 the cardinal Rohan appointed Oliva to be his librarian, in which office he continued during the remainder of his life, occupying himſelf indefatigably in enriching the vaſt collection of that prelate, and drawing up an exact account of its contents. The catalogue amounted to twenty-five volumes in folio. He gave an edition, in 1723, of ſome letters of Poggio, which had hitherto remained in manuſcript. He died at Paris in 1757; after his death were printed his works, conſiſting of the two diſſertations already referred to, together with another, pronounced at Azzolo, "On the Neceſſity of adding the Study of Medals to that of Hiſtory." Moreri.

OLIVA, in *Geography*, a ſea-port town of Pomerania, ſituated on a bay in the Baltic, and famous for a treaty of peace which was concluded between the emperor and the kings of Sweden and Poland, in the year 1660; 10 miles W. of Dantzic. N. lat. 54° 26'. E. long. 18° 22'.—Alſo, a town of Spain, in Valencia, near the Mediterranean coaſt, in the vicinity of which ſugar canes are cultivated; 40 miles N. of Alicant.—Alſo, a ſmall iſland in the Mediterranean, near the coaſt of Caramania. N. lat. 36° 25'. E. long. 33° 10'.

OLIVAREZ, *Count de*, in *Biography*, named Gaſpar de Guſman, favourite and miniſter to Don Philip IV. of Spain, ſucceeded Uzeda as prime miniſter, and gained popularity by his wiſe and ſalutary regulations. Notwithſtanding the good he did, he was always an enemy to peace, and it was owing to his ambition that an almoſt general war was excited about the year 1627, which proved very fatal to Spain. His pride and obſtinacy were the cauſe of many calamities to his country. The revolt of the Catalans, whom he wiſhed to deprive of their privileges, was a conſequence of his folly: he had privately employed the marquis de los Velez to extinguiſh this rebellion; but the cruelty of the meaſures uſed for this purpoſe only inflamed it the more. The revolution of Portugal, which was terminated by its ſeparation from the Spaniſh provinces, another diſaſtrous event, was alſo the reſult of his temper. The great ſecret by which Olivarez had governed his maſter, was being the companion, or at leaſt the confidant, of his pleaſures. While he attempted to deceive the world with a ſpecious appearance of religion and piety, he was not only immerſed in vice himſelf, but encouraged and promoted it in the monarch, to the ſcandal of his ſubjects, and the prejudice of his affairs. At length his ſchemes began to be entirely broken and defeated; he fell under the diſpleaſure of the queen, the emperor, the grandees, and the people, at one and the ſame time, and experienced the diſgrace which he had long merited. He was baniſhed to Toro, where, worn out by infirmities, or overcome by deſpair, he ended his days about the year 1645.

OLIVAREZ, in *Geography*, a town of Spain, in Old Caſtile; 18 miles S.E. of Valladolid.

OLIVARIA CORPORA, in *Anatomy*, two ſmall eminences of the medulla oblongata. See BRAIN.

OLIVAS, in *Geography*, a town of Portugal, in the province of Beira; 6 miles S.W. of Viſeu.

OLIVE, PETER JOHN DE, in *Biography*, a celebrated Franciſcan monk in the thirteenth century, was regarded as chief of that branch of the order which diſputed ſo frequently with the popes, in favour of the renunciation of property in obedience to the inſtitution of St. Francis. He acquired, by his writings, a high reputation for ſanctity and ſound learning, and drew after him a number of followers. One of the great objects which he ſeems never to have loſt ſight of in his writings, was the corruption of the church of Rome, which he cenſured with great ſeverity, in a work entitled "Poſtilla, or a Commentary on the Revelation," affirming boldly that the church was repreſented by the woman, upon whoſe forehead was a name written, "Myſtery, Babylon the great, the mother of harlots, and abominations of the earth," whom St. John ſaw ſitting "upon a ſcarlet-coloured beaſt, full of names of blaſphemy, having ſeven heads and ten horns." It muſt be obſerved, that this cenſor

of the church was himſelf a moſt ſuperſtitious fanatic in ſeveral reſpects, having imbibed the greateſt part of thoſe opinions which the ſpiritual Franciſcans pretended to have received from the abbot JOACHIM; ſee his article. He went ſtill farther, and contended that St. Francis, whom he conſidered as wholly and entirely transformed into the perſon of Chriſt, was the ſubject of adoration. He was himſelf accuſed of hereſy, and cenſured by his judges, but ſubmitting to the judgment patiently, he eſcaped the ſevere treatment to which many of his followers were ſubjected. He died in 1297, and it was pretended, that miracles were wrought at his tomb. The zeal with which he defended the cauſe of the gloomy Franciſcans, in his "Treatiſe on Poverty," and his other writings, led them to venerate him as a ſaint. But in the year 1325, pope John XXII. ordered his bones to be taken from the tomb, and publicly burnt, together with his writings; pope Sixtus IV., however, ordered his works to be examined anew, and a ſentence was now pronounced in their favour, or at leaſt as containing no doctrines nor precepts inconſiſtent with the true Catholic faith or good morals. Moreri.

OLIVE-*Tree*, in *Botany*. See OLEA.

OLIVE *Gum*. See GUMMI *Olivæ:*

OLIVE, *Spurge*. See SPURGE *Laurel.*

OLIVE, *Wild*. See OLÆAGNUS.

OLIVE, *Barbadoes Wild*. See BONTIA.

OLIVE-*Colour* is a yellow mixed with black.

The term is chiefly uſed in ſpeaking of the tincture of the complexion: the Spaniards and Indians are rarely white, generally olive-complexioned.

OLIVE *Iſland*, in *Geography*, a ſmall iſland in the Mergui Archipelago, hardly a mile in circumference; captain Forreſt found on this iſland ſome trees of the true olive. N. lat. 11° 20′.

OLIVECRANTZ, JOHN PAULIN, in *Biography*, known as a member of the council of Chriſtina, queen of Sweden, was the ſon of a Swediſh archbiſhop, and born in 1633. He was carefully inſtructed by his father in claſſical learning, and made very conſiderable progreſs in his ſtudies. In 1658 he was appointed ſecretary of legation to Frankfort, in order to be preſent at the election of the emperor. He was afterwards ſent ambaſſador to Nimeguen, to aſſiſt in the negociations for peace; and in 1680 was made governor of Revel, and ſupreme judge of Gothland. He was in high favour with Chriſtina, who commanded him to prefix to his title the qualification of excellency, a circumſtance which gave riſe to much jealouſy, and excited againſt him a hoſt of enemies. The queen correſponded with him after her abdication, and endeavoured to perſuade him to follow her to Rome. He died at Stockholm in 1707, and is eſteemed by his countrymen as one of their beſt Latin poets. His principal works are "Oratio in Laudes Reginæ Chriſtinæ Græce habita Upſaliæ;" "Magnus Principatus Finlandiæ Epico Carmine depictus Oratione Græca Holmiæ." Gen. Biog.

OLIVEIRA *de Bairro*, in *Geography*, a town of Portugal, in the province of Beira; 21 miles N. of Coimbra.

OLIVEIRA *de Condé*, a town of Portugal, in the province of Beira; 12 miles S.W. of Viſeu.

OLIVENÇA, a town and fortreſs of Portugal, in Alentejo, on the borders of Spain; to which country it was ceded by the peace of Badajoz, ſigned June the 6th, 1801; 13 miles S. of Elvas. N. lat. 38° 30′. W. long. 6° 50′.

OLIVER, ISAAC, in *Biography*, one of the firſt Engliſhmen who roſe to any tolerable degree of eminence in the art of painting; the firſt rudiments of which he imbibed from N. Hilliard; but was principally indebted for inſtructions to Frederic Zucchero. He was born in 1556. His principal employment was in portraits, and thoſe in miniature, which he wrought with great reſemblance to nature in form and character, and his touch was uncommonly delicate. He ſometimes employed himſelf in making drawings upon a large ſcale, and alſo in painting in oil colours; but to neither of theſe is he indebted for his reputation ſo much as to his miniatures. Many very fine ones of his painting ſtill remain in poſſeſſion of the nobility of this country.

Dr. Meade's collection was very rich in them; one of queen Elizabeth, others of Mary queen of Scots, Henry prince of Wales, Ben Johnſon, and ſir Philip Sidney, at whole length, ſitting under a tree: theſe were all purchaſed by the king's father, Frederic prince of Wales, and now form a part of his majeſty's collection. They are moſt to be admired for their extreme neatneſs and truth; with a taſteful expreſſion of feature rarely found in portraits; but their actions are void of grace, and exhibit the general want of taſte in art at that period. He died in 1617, aged 61.

OLIVER, PETER, the ſon and diſciple of Iſaac Oliver, was born in 1601, and ſucceeded his father in the profeſſion of miniature painting, confeſſedly even more ſucceſsful than him or any of their contemporaries. His pictures, like his father's, are ſpread among the houſes of the nobility and gentry, and are alike juſtly eſteemed. The works which he executed upon a larger ſcale are much more valuable than thoſe of his father, and are alſo more numerous, though not very frequently to be met with. Walpole mentions that there were thirteen works of Peter Oliver in the collection of Charles I. and of James II.; and that ſeven of them are preſerved in queen Caroline's cloſet at Kenſington; and he alſo ſpeaks of a portrait of Mrs. Oliver by her huſband, in poſſeſſion of the ducheſs of Portland, as being of uncommon quality. He died in 1660.

OLIVERI, in *Geography*, a river of Sicily, which runs into the ſea, between Patti and Milazzo.

OLIVES, *Mount of*, or *Mount* OLIVET, in *Biblical Geography*, a mountain of Paleſtine, which is ſituated about a mile diſtant from Jeruſalem, and commands the proſpect of the whole city, from which it is parted by the brook Kidron, or Cedron, and the valley of Jehoſhaphat. This is not a ſingle hill, but rather part of a long ridge, with three, or, according to Pococke, four, heads or ſummits, extending from N. to S.; the middlemoſt of which is that from which our Saviour aſcended into heaven. On this ſummit is a ſmall round church. Here was formerly a magnificent church, built by the empreſs Helena, in memory of Chriſt's aſcenſion; but there now only remains a Gothic octagonal cupola, about eight yards in diameter. The natives have here two altars; and the Greeks, Copts, and Armenians, one each, in which they ſay maſs; but Chriſtians of every deſcription have free acceſs to the place throughout the whole year, upon paying a certain caphar, or tribute. Every place that is ſhewn upon this mountain has either a church, chapel, or oratory, to feed the devotion of pilgrims, and the indigence of the monks that reſide upon the ſpot. The ſecond ſummit of the mountain, towards the S., is that called the "Mount of Corruption or Offence." The third, towards the N., which is the higheſt ſummit of all, and ſtands about two furlongs from the middlemoſt, is that which was moſt commonly ſtyled the "Mount of Galilee." Here are alſo ſhewn many places mentioned in the goſpel; ſuch as that where Chriſt mounted the aſs; where he wept over Jeruſalem, &c. Theſe are ſtill viſited by multitudes of Chriſtians of all ſorts; though the Latins have the poſſeſſion of them, and perform the particular ceremonies that



belong

belong to each reſpective place; *e.g.* on Palm Sunday, the monks and prieſts attend their ſuperior from the place where Chriſt, mounted on an aſs, proceeded to Jeruſalem. He is dreſſed in his pontifical habit, mounted alſo on an aſs, and accompanied by crowds of ſpectators, who cut down and ſtrew branches before him, and make the air reſound with their harangues. The mount of Olives was originally called by the Jews the "Mount of Unction," on account of the great quantity of oil that was made from the olives that grew upon it; but when Solomon had once defiled it, by erecting ſundry temples to the gods of the Ammonites, Moabites, &c. in complaiſance to his ſtrange wives, they changed the name of it by a ſmall alteration of the letters, that is, of שרת into משחית, into another, which ſignifies the "Mount of Corruption, Deſtruction, or Offence." The Greeks, however, have retained its ancient appellation of Ὄρος ελαιῶν, or Ὄρος τῶν ἐλαιῶν, mount of olives.

The evangeliſt Luke, ſuppoſed to be the writer of the Acts, as well as of the goſpel that bears his name, has been charged by one advocate of the cauſe of infidelity, with having contradicted himſelf; for in his goſpel he tells us, that Jeſus aſcended into heaven from Bethany; and in the Acts of the Apoſtles he informs us, that he aſcended from mount Olivet. This objection proceeds, as the learned biſhop of Landaff has obſerved in his excellent "Apology for Chriſtianity," either from ignorance of geography, or ill-will to Chriſtianity; and he recommends to the writer to recollect for the future, that Bethany was not only the name of a town, but alſo of a diſtrict of mount Olivet adjoining to the town.

OLIVET, Joseph Thoullier d', in *Biography*, an eſtimable man of letters, was born in 1682 at Salins, in Franche Compté. He was educated by his father, who was afterwards a counſellor in the parliament of Beſançon, and at an early age he entered among the Jeſuits, in which ſociety he had an uncle diſtinguiſhed for his learning. During his continuance among the Jeſuits, he frequently viſited Boileau, and his admiration of the poet cauſed him to imbibe his principles of literature. The taſte which he acquired was rather manly and auſtere, than refined; and it was accompanied with a correſponding bluntneſs of manners and addreſs. The example of his friend led him to make trial of his powers in French verſe; but in the maturity of his judgment he committed all his poetry into the flames. He exerciſed himſelf in compoſitions for the pulpit; and in order to form his taſte for oratory on the beſt models, he became a very aſſiduous ſtudent of the works of Cicero. He was invited to undertake the tuition of the prince of Aſturias in Spain, which he declined, preferring the eaſe and independence of a private ſtation to a brilliant ſervitude. At the age of thirty-three he quitted the ſociety of the Jeſuits, and thenceforward devoted himſelf to the life of a man of letters at Paris, and in 1723 he was elected into the French academy. The firſt work which he committed to the preſs was a tranſlation of Cicero, "De Natura Deorum." After this he publiſhed the Tuſculan queſtions, and the orations againſt Catiline: and, at a ſubſequent period, he collected from the works of Cicero thoſe paſſages which he thought beſt calculated, as well to form the literary taſte of young perſons, as to inſpire them with uſeful moral principles, and publiſhed them in a tranſlation, under the title of "Penſées de Ciceron, pour ſervir a l'Education de la Jeuneſſe." A complete edition of the works of his favourite author was an object that long and deeply engaged his attention, which he at length brought out at Paris, under the patronage of the government, in nine volumes 4to. An edition of this work was publiſhed at Geneva in 1758, which is in the higheſt eſtimation, is very rare, and fetches a very high price. To each volume are attached tables, particularly an uſeful one, containing all the various readings collected from the principal editions of Victorius, Manutius, Lambinus, and Gruterus, together with thoſe propoſed by Olivet in his Commentaries. Of the edition, by this editor, the biographer ſays, "it is the character that it performs more than it promiſes. Beſides a very correct text, it contains a very judicious collection of notes by the beſt commentators, with a learned and well-written preface of his own." In the Geneva edition, the errors that had eſcaped M. Olivet are carefully corrected.

Olivet was a diligent ſtudent of the grammar of his own language, and publiſhed a treatiſe on "French Proſody," in which he attempted to prove that almoſt all French ſyllables have a determinate meaſure, and are as ſuſceptible of quantity as thoſe of Greek and Latin. This was ſucceeded by "Remarques de Grammaire ſur Racine." His attachment to the French academy led him to write the hiſtory of that body in continuation of that of Peliſſon. This work, which comes down to the commencement of the 18th century, is valuable for the accuracy of its reſearches, and the intereſting anecdotes preſerved in it. He publiſhed "Opuſcules ſur la Langue Françoiſe," to which he added the abbè de Choiſi's "Journal of Diſcuſſions," on points of grammar, at the ſittings of the academy. He was a moſt regular attendant on the meetings of the French academy, and on his return from one of them, in October 1768, he was attacked with a fit of apoplexy, which terminated his life at the age of 86.

As a tranſlator, Olivet is faithful and elegant: to his verſion of the treatiſe "De Natura Deorum," he annexed a tract of his own relative to ancient philoſophy, which he entitled "Theologie des Philoſophes," to which theology, according to D'Alembert, his philoſophical knowledge was in a great meaſure limited. The abbè d'Olivet was ever ready to perform good offices for his literary brethren, and through his means many ſcholars obtained eligible and reſpectable ſituations in life. He had familiar acceſs to cardinal Fleury, the prime miniſter, and the biſhop of Mirepoix, the diſtributor of eccleſiaſtical beneſices, who could not but admire the intereſt which he took in obtaining favours for others, while he aſked nothing for himſelf. He preſerved to the end of his life the intimate friendſhip of ſeveral perſons of eminence, and though ſparing in his approbation of modern productions, he appears to have been free from envy and jealouſy. In his mode of living he was moderate and economical; and he ſacrificed the greateſt part of his patrimony to the advantageous ſettling of his nephews. Gen. Biog.

Olivet, in *Geography*, a town of France, in the department of the Loiret, and chief place of a canton, in the diſtrict of Orleans, ſituated on the S. ſide of the Loire; 3 miles S. of Orleans. The place contains 3250, and the canton 7102 inhabitants, on a territory of 185 kiliometres, in 7 communes.

OLIVETAN, Robert, in *Biography*, the firſt perſon who publiſhed a verſion of the ſcriptures in the French language, from the original Hebrew and Greek Septuagint, for the uſe of the inhabitants of the Valais. Of his hiſtory nothing is known, except that he was a relation of John Calvin, and he is ſaid to have been poiſoned at Rome in the year 1536. His tranſlation was printed at Neufchatel in 1535, and was the foundation of the Geneva verſion in common uſe, after it had gone through various reviſions by Calvin, Beza, and others. The character of Olivetan's impreſſion is Gothic: he is ſaid to have committed many miſtakes,

miſtakes, but it was no ſmall thing gained to have the ſcriptures, in any way, given in the vernacular language of the country. Calvin's firſt reviſed edition of this tranſlation came out at Geneva in 1550, copies of which, as well as of Olivetan's in the Gothic character, are now exceedingly ſcarce.

OLIVIER, Seraphim, a learned French eccleſiaſtic, who was promoted to the purple in the early part of the ſeventeenth century, was born at Lyons in the year 1538. He ſtudied the civil and canon law at Bologna, after which he went to Rome, and obtained the patronage of pope Pius IV., who made him auditor and dean of the *Rota*, which poſts he retained during forty years. He was employed as nuncio by popes Gregory XIII., Sixtus V., and Clement VIII., of whom the latter, in 1604, beſtowed upon him the title of patriarch of Alexandria, and raiſed him to the ſacred college, at the recommendation of king Henry IV. He was likewiſe nominated to the biſhopric of Rennes in Britanny. He died in 1609, at the age of ſeventy-one. He prepared for the preſs "Deciſiones Rotæ Romanæ," which were printed at Rome in 1614, in two volumes folio, and were reprinted at Frankfort in the following year. Moreri.

Olivier, Claude Matthieu, advocate of the parliament of Aix, was born at Marſeilles in 1701. He was brought up to, and ſucceſſfully practiſed at the bar. He poſſeſſed a quick and lively genius; and at any time, a few hours retirement from ſociety was ſufficient to enable him to ſpeak and write, even on important cauſes. He was a man of great talents, but took little pains to improve them; he was given to exceſs in almoſt every thing; he would employ a fortnight in ſtudying the Code and the Digeſt, or in ſtoring his mind with the beauties of Demoſthenes, Homer, Cicero, or Boſſuet, and then abandon himſelf to a life of frivolity and diſſipation. He died in 1736, at the age of 35. He had a chief hand in the eſtabliſhment of the academy of Marſeilles, and was of courſe one of its original members. He publiſhed (1) "L'Hiſtoire de Philippe Roi de Macedoine, et Père d'Alexandre le Grand," in two vols. 12mo. No writer, it is ſaid, has ſo ably handled the hiſtory of the age of Philip, the intereſts of the different nations of Greece, and their manners and cuſtoms, but the conduct of the work is extremely defective; the digreſſions are frequent and tedious, and the ſtyle is not ſuitable to a hiſtory. A diſeaſe of the brain, with which he was attacked, and under which he laboured a long time, prevented him from putting his laſt hand to this work. 2. "Mèmoire ſur les Secours donnès aux Romains par les Marſeillois pendant le ſeconde Guerre Punique." 3. "Mèmoire ſur les Secours donnès aux Romains par les Marſeillois durant la Guerre contre les Gaulois."

OLIVIN, *Volcanic Chryſolite*, *Peridot granuliforme*, Haüy, in *Mineralogy*, a ſpecies of *Chryſolite* (ſee Chrysolite), the colour of which is between aſparagus and olive-green, and which, by expoſure to the weather, becomes yelloviſh-brown. It occurs imbedded in baſalt, ſometimes in rounded pieces, and rarely in rectangular priſms. Its luſtre varies internally between glimmering and ſhining, and is vitreous, paſſing into reſinous. Its fracture conchoidal, paſſing into ſplintery and uneven, and its fragments indeterminately ſharp-edged. In large pieces it exhibits granular diſtinct concretions. It varies from ſemi-tranſparent to tranſlucent; it is hard, but leſs ſo than quartz; brittle and eaſily frangible. Sp. gr. 3.22 to 3.26: nearly infuſible before the blowpipe, without addition, and loſes its colour by digeſtion in nitric acid. The analyſis of it by Klaproth is as follows:

| | | | | |
|---|---|---|---|---|
| | 48. | to | 52. | Silex |
| | 37. | — | 38.5 | Magneſia |
| | 0.25 | — | 0.20 | Lime |
| | 12.5 | — | 12. | Oxyd of iron |
| | 97.75 | | | |
| Loſs | 2.25 | | | |
| | 100. | | | |

It is eaſy of decompoſition, and to this circumſtance many baſalts owe their porous texture. Olivin is found very abundantly in Bohemia and other parts of Germany, and alſo in France, Britain, Norway, and Sweden. Aikin's Dict.

OLIZAROWSTOW, in *Geography*, a town of Poland, in the palatinate of Brzeſc; 14 miles E. of Brzeſc.

OLKILUOTO, a ſmall iſland on the E. ſide of the gulf of Bothnia. N. lat. 61° 15'. E. long. 21° 15'.

OLKINIKI, a town of Lithuania, in the palatinate of Troki; 22 miles S. of Troki.

OLKOWITZ, or Alexowice, a town of Moravia, in the circle of Znaym; 9 miles N.E. of Znaym.

OLKUSZ, or Ilkusk, a town of Poland, in the palatinate of Cracow; formerly celebrated for its mines; 16 miles N.W. of Cracow.

OLLA, a river of Germany, which runs into the Weſer; 17 miles below Bremen.

Olla, in *Mythology*, was the pot in which the prieſts boiled the portion of the victims that was allotted to them.

OLLBRUCKEN, in *Geography*, a town of France, in the department of the Rhine and Moſelle, late the capital of a lordſhip, in the electorate of Cologne; 18 miles N.W. of Coblentz.

OLLERIA, a town of Spain, in the province of Valencia; 5 miles S. of St. Felipe.

OLLEROS Point, a cape and harbour on the coaſt of Peru; S. lat. 14° 36'.

OLLET, in *Rural Economy*, a term applied to fuel of any kind.

OLLIERGUES, in *Geography*, a town of France, in the department of the Puy-de-Dôme, and chief place of a canton, in the diſtrict of Ambert; 9 miles N N.W. of Ambert. The place contains 1760, and the canton 7192 inhabitants, on a territory of 147½ kiliometres, in 5 communes.

OLLIOULLES, a town of France, in the department of the Var, and chief place of a canton, in the diſtrict of Toulon; 4 miles W. of Toulon. The place contains 2591, and the canton 14,363 inhabitants, on a territory of 195 kiliometres, in 6 communes.

OLLYA, a town of Bengal; 30 miles S.W. of Rogonatpour.

OLMAN, a ſmall iſland on the W. ſide of the gulf of Bothnia. N. lat. 61° 38'. E. long. 17° 11'.

OLMEDILLA, a town, or rather village, of Spain, in New Caſtile, ſituated on the road from Madrid to Valencia, and half way on the royal route leading to thoſe two capitals.

OLMEDO, a ſmall town of Spain, ſeated on an eminence in front of an extenſive plain: it was formerly ſurrounded by walls, of which ſome remains are ſtill viſible; it has ſeven parochial ſtructures, and as many religious houſes. The principal altar of St. Mary's church is adorned with good paintings. The population of this place was more conſiderable, but is now reduced to the number of 2000 inhabitants, who carry on no other traffic than

than that which is derived from their brick-kilns. In its vicinity are ſome vineyards and kitchen-gardens. It is under the adminiſtration of a corregidor; 16 miles S. of Cuença.

OLMESSA, a town of the iſland of Corſica; 5 miles N.E. of Corte.

OLMESTA, a town of Sweden, in Eaſt Gothland; 30 miles S.W. of Linkioping.

OLMETO, a town of the iſland of Sardinia; 7 miles N. of Alghieri.—Alſo, a town of the iſland of Corſica; 7 miles W. of Tallano.

OLMETTA, a town of Corſica; two miles S.W. of Oletta.

OLMOS, Fr. Andres de, in *Biography*, was born near Oria, in the diſtrict of Burgos, in the latter part of the fifteenth century, and was brought up in the houſe of a married ſiſter at Olmos, near Valladolid, from which place he took his name. At the age of twenty he took the Franciſcan habit in the convent at Valladolid. He diſtinguiſhed himſelf by his application to theological ſtudies, and was ſent by Charles V. as one of the inquiſitorial commiſſioners againſt the witches of Biſcay. He acquitted himſelf ſo much to the ſatisfaction of his companion Zumarraga, that when the latter was appointed biſhop of Mexico, in 1528, he took Olmos with him to the new world. Here his zeal was wiſely directed, and he began a ſeries of labours which entitle him to the reſpect of poſterity. He found it neceſſary to learn four languages, *viz.* the Mexican; the Totonaca; the Tepehua; and the Guaxteca. Of the two firſt he wrote grammars and vocabularies, which have been of eſſential ſervice to other miſſionaries. He was author of very many religious tracts, in the different languages of the tribes among whom he paſſed the greater part of his life, enduring with patience and fortitude every kind of privation and difficulty. He lived, however, to a great age, and died in October 1571. He is ranked among the poets of Spain, having tranſlated into Caſtilian verſe a Latin work upon Hereſy, by Alonzo de Caſtro. Gen. Biog.

OLMUS, in the *Inſtrumental Muſic of the Ancients*, the name of one of the joints of the ancient flutes, and probably the upper joint or embouchure. See Bombyx.

OLMUTZ, in *Geography*, a city and capital of the marquiſate of Moravia, and of a circle of the ſame name, ſeated on the river Morawa, the firſt royal borough and ſee of a biſhop, ſurrounded by the river. It is a fortified, well-built, and populous town; divided into the Old and New Town, and containing twenty-ſix churches, five chapels, ſeven cloiſters of monks, and two of nuns, ſeveral hoſpitals, a correction and an orphan-houſe, a college and ſeminary, an univerſity, founded in 1567, a riding academy, and a learned ſociety. The caſtle is ſtrong, and has often ſerved as a ſtate priſon; 80 miles N.N.E. of Vienna. N. lat. 49° 33′. E. long. 17° 11′.

OLNEY, or Oulney, a market town and pariſh in the firſt diviſion of the three hundreds of Newport, and county of Buckingham, England, is ſituated on the north bank of the river Ouſe, near the borders of Northamptonſhire, and at the diſtance of fifty-ſix miles from the metropolis. The houſes in the town, except thoſe of late erection, are moſtly covered with thatch, and chiefly ranged in one long ſtreet. In 1786, a fire happened here, which deſtroyed forty-three large tenements, and occaſioned other conſiderable damage. The church is a large ancient ſtructure, in the pointed ſtyle, adorned with a handſome tower and ſpire, the latter riſing to the height of 185 feet. In the cemetery formerly ſtood a chapel, dedicated to the Virgin Mary, in which was a chantry, founded by lord Baſſet. Lace-making conſtitutes the chief employment of the inhabitants of Olney. The market is held on Monday every week, and there are three fairs annually. According to the parliamentary returns of 1811, this town and pariſh contain 484 houſes, and a population of 2268 perſons. Previous to the year 1767, the pariſh of Olney was one entire common, but at that period it was incloſed under the authority of an act of parliament. The manor anciently belonged to the earls of Cheſter, from whom it paſſed to the two families of Albini and Baſſet. It afterwards became the property of Thomas Moubray, duke of Norfolk, after whoſe baniſhment the king granted it to Edward, duke of York, who was ſlain at the battle of Agincourt. Upon this event it reverted to the crown, and continued part of the royal demeſnes till the year 1638. Its preſent proprietor is the earl of Dartmouth.

Weſton-Underwood, a ſmall village ſituated about a mile ſouth from Olney, was long the reſidence of the celebrated poet Cowper, who died here on the 25th of October 1800. Many deſcriptions in his poem of the Taſk were drawn from the ſcenery adjoining to this town. At Lavendon, two miles to the north, formerly ſtood an abbey for Premonſtratenſian monks, founded by John de Bidun, a baron, in the reign of Henry II. This place appears to have been anciently of much more importance than at preſent, as it had a weekly market and an annual fair; and was protected by a caſtle, ſome veſtiges of which can ſtill be traced. Ravenſton, to the weſt of Olney, is noted as the birth-place of the great lord chancellor Nottingham, who was ſtyled by his contemporaries the Engliſh Cicero, and who is characteriſed by the late ſir William Blackſtone as a lawyer of firſt rate abilities and ſterling integrity. He died in 1682, after having been advanced to the dignity of an earl, and lies buried in the church of this village, where is a magnificent monument erected to his memory by his ſon. His effigy is finely executed in white marble, in his chancellor's robes, and reclines under a canopy ſupported by four black marble pillars of the Corinthian order. Magna Britannia, by the Rev. Dan. Lyſons, A.M. F.R.S. and Samuel Lyſons, eſq. F.R.S. 4to.

OLOBOK, a town of the duchy of Warſaw; 12 miles S. of Kaliſch.

OLOC, in *Natural Hiſtory*, a name given by the people of the Philippine iſlands to their quail. It is like our's in all reſpects, but much ſmaller.

OLOCENTROS, a name given by the old Greeks to a ſmall animal of the ſpider kind, whoſe bite was accounted mortal. It is the ſame with the *ſolipuga*, ſo called from its ſtinging, or biting moſt violently, in places, or ſeaſons, where the ſun had the moſt power, as Africa, &c. The name *ſoliſuga* was a corrupt way of writing that word, and this ſeems alſo a falſe way of writing the word *heliocentros*, which ſignifies the ſame as *ſolipuga*.

OLOMPAN, in *Geography*, a town of Mexico; 40 miles E.N.E. of Mexico.

OLONA, a river of Italy, which runs into the Po; 12 miles W. of Piacenza.—Alſo, the name of one of the twelve departments of Italy, formerly a part of the duchy of Milan, which is divided into four diſtricts, and contains above 193,189 inhabitants, who elect fifteen deputies. The capital is Milan.

OLONEI, an iſland near the S. coaſt of Nova Zembla, in the ſtraits of Vaigatſkoi. N. lat. 70° 30′. E. long. 58° 29′.

OLONETZ, a town of Ruſſia, built by Peter I., in which is an iron forge, and in its vicinity are mines of copper and iron, and a mineral ſpring; 104 miles N.E. of Peterſburg. N. lat. 61° 10′. E. long. 32° 38′.

OLONETZKOI, a government of Ruſſia, bounded on the N. by the government of Archangel, on the E. by the ſame and the White ſea, on the S. by that of Novgorod and Vologda, and on the W. by that of Viborg and Finland; about 340 miles from N. to S. and in its greater breadth from E. to W. 240 miles; but along the White ſea its mean breadth is about 100. Olonetz, from which it derives its name, is the capital. N. lat. 61° 40′ to 66° 40′. E. long. 28° to 41°.

OLONNE, Sables d'. See Sables *d'Olonne*.

OLONSKA, a town of Ruſſia, in the government of Irkutſk; 48 miles S.E. of Balaganſkoi.

OLONZAC, a town of France, in the department of the Herault, and chief place of a canton, in the diſtrict of St. Pons; 15 miles S. of St. Pons. The place contains 850, and the canton 6716 inhabitants, on a territory of 257½ kiliometres, in 13 communes.

OLOPHRYME, in the *Muſic of the Ancients*, according to Athenæus, was the title of funeral ſongs with the Greeks.

OLOSOTAI, in *Geography*, a town of Aſia, in the country of Hami; 20 miles N.N.W. of Tche-tcheou-Hotun.

OLOST, a town of Spain, in Catalonia; 9 miles W.N.W. of Vique.

OLOSTELESEK, a town of Tranſilvania; 22 miles N.N.W. of Cronſtadt.

OLOT, a town of Spain, in Catalonia; 17 miles N.W. of Gerona.

OLOU-HOCHO, a town of Chineſe Tartary; 38 miles S.S.W. of Soubarkan.

OLOUS, a town of Aſiatic Turkey, in Natolia; 12 miles E. of Amaſreh.

OLPE, a town of Germany, in Weſtphalia; 37 miles E. of Cologne. N. lat. 50° 59′. E. long. 7° 59′.

OLPHEN, a town of Germany, in the biſhopric of Munſter; 17 miles S.S.W. of Munſter. N. lat. 51° 42′. E. long. 7° 28′.

OLRICK, a town of Scotland, in the county of Caithneſs; 6 miles E.S.E. of Thurſo.

OLSCHANKA, a town of Ruſſia, in the government of Ekaterinoſlav; 40 miles S.W. of Novo-Mirgorod.

OLSZTYN, a town of Poland, in the palatinate of Cracow; 40 miles N.W. of Cracow.

OLTEN, a ſmall town of Switzerland, in the canton of Soleure, whither the meeting of the Helvetic Society is now transferred. This ſociety conſiſts of the moſt learned men of the country, both of the Catholic and Reformed religion, who firſt contributed to extend the ſpirit of toleration, and to leſſen that antipathy which ſubſiſted between the members of the two perſuaſions. It firſt met at Schintznach, agreeably ſituated on the banks of the Aar, and noted for its tepid and mineral waters. The town of Olten was purchaſed by the canton of Soleure in 1532; 17 miles E.N.E. of Soleure.

OLTENPACH, a town of the duchy of Stiria; 16 miles S.E. of Voitſberg.

OLTIFI, a town of Aſiatic Turkey, in the government of Kars; 30 miles N. of Kars.

OLTRI, a town of Italy, in Friuli; 38 miles N.W. of Friuli.

OLTSCHIN, a town of Auſtrian Poland; 52 miles N.N.W. of Cracow.

OLU Jachseb, a town of Arabia, in the province of Hadramaut; 136 miles S.W. of Amanzirifdin.

OLUTOR, a river of Ruſſia, which runs into the North Pacific ocean. N. lat. 61° 10′. E. long. 167° 54′.

OLUTOROVSKOI, a town of Ruſſia, on the forementioned river, on the coaſt of the Pacific ocean; 164 miles E. of Oklanſk. N. lat. 61° 30′ E. long. 167° 54′. —Alſo, a cape of Ruſſia, in the North Pacific ocean; 100 miles S. of the town of Olutorovſkoi. N. lat. 59° 50′. E. long. 168° 54′.

OLYBRIUS, in *Biography*, a ſhort-lived emperor of the Weſt, had been inveſted with the conſular dignity by Leo, emperor of the Eaſt. When the powerful count Ricimer had reſolved on the depoſition of the emperor Anthemius, he propoſed to raiſe Olybrius to the high dignity, who was alſo ſupported by Genſeric, king of the Vandals. Ricimer laid ſiege to Rome, put to death Anthemius, though his father-in-law, and ordered Olybrius to be proclaimed emperor, A.D. 472. This elevated ſtation he enjoyed a very ſhort time. Ricimer, who had cauſed the death of three emperors, died, and Olybrius ſoon followed him, after a reign of only a few months. Gibbon, in deſcribing the ſiege and aſſault of Rome juſt referred to, ſays, "forty days after this calamitous event, the ſubject, not of glory, but of guilt, Italy was delivered, by a painful diſeaſe, from the tyrant Ricimer, who bequeathed the command of his army to his nephew Gundobald, one of the princes of the Burgundians. In the ſame year, all the principal actors in this great revolution were removed from the ſtage, and the whole reign of Olybrius, whoſe death does not betray any ſymptoms of violence, is included within the term of ſeven months. He left one daughter, the offſpring of his marriage with Placidia, and the family of the Great Theodoſius, tranſplanted from Spain to Conſtantinople, was propagated in the female line as far as the eighth generation." Gibbon's Hiſt. vol. vi.

OLYKA, in *Geography*, a town of Poland, in Volhynia; 22 miles N.E. of Lucko.

OLYMPIA, in *Ancient Geography*, a celebrated city of Greece, in Triphylia, ſituated on the river Alpheus, N. of Hypana. It is not certain whether this city had in former times borne the name of "Piſa," or whether they were diſtinct cities. Of all the cities of Greece this was the moſt famous on account of the games which were inſtituted in it, and which drew thither a prodigious concourſe of people. (See Olympics.) At Olympia there was a grove of olives, conſecrated to Jupiter, and which was called "Altis." The temple of the Olympian Jupiter ſurpaſſed all others in beauty, and the ſtatue of this deity which graced this temple was the moſt magnificent of all the works of Phidias, the principal ſculptor of Greece. Its height was ſixty feet: it was formed of gold and ivory, and held in ſuch eſtimation, that it was thought a misfortune for any one to die without having ſeen this ſtatue. The deity was repreſented in a ſitting poſture, with a crown of olive on his head, holding in one hand victory, and in the other a ſceptre, ſurmounted with an eagle. The ſandals of the god, and alſo his robe, are of gold. His throne is diverſified with gold and precious ſtones, with ebony and ivory, and painted with the repreſentations of divers kinds of animals. About it are alſo many figures in ſculpture; *e.g.* four victories in the attitude of dancers, round the upper part of each leg of the throne, and two more at each of the feet. On thoſe legs alſo which ſupport the fore part of the throne, are carved ſphinxes, devouring the Theban children, and under the ſphinxes, Apollo and Diana ſlaying with their arrows the children of Niobe. The baſis or pedeſtal, which ſuſtains the whole work, is enriched with many other ornaments and figures in gold, all of which have ſome relation to Jupiter; ſuch as the Sun mounting his chariot, attended by Jupiter and Juno, and one of the Graces,

Graces, next to whom ſtands Mercury, and next to Mercury Veſta; after Veſta is ſeen Cupid receiving Venus ariſing out of the ſea, and the goddeſs Perſuaſion placing a crown on the head of Venus. Here are alſo the figures of Apollo and Diana, of Minerva and Hercules, and on the loweſt part of the baſis, Neptune and Amphitrite, and the Moon riding on a horſe. Jupiter, as the Eleans ſay, was ſo pleaſed with Phidias, the ſtatuary, for this performance, that, in compliance with his wiſhes, he teſtified his approbation by cauſing the pavement to be ſtruck with lightning, upon which place a brazen urn was fixed as a permanent memorial of the miracle. Phidias is ſaid to have been aſſiſted in the compoſition, the colours, and particularly the drapery of this ſtatue, by Panænus, a painter, his brother and fellow-workman, many of whoſe admirable paintings were ſeen in various parts of the temple. Tradition reports, that Phidias, being aſked by Panænus, by what pattern or idea he intended to frame his image of Jupiter, anſwered, by that given in the following verſes of Homer, lib. i.

"This ſaid, his kingly brow the Sire inclin'd,
The large black curls fell, awful, from behind,
Thick ſhadowing the ſtern forehead of the god;
Olympus trembled at th' almighty nod."

The temple was of the Doric order, and the place in which it was conſtructed formed a fine periſtyle, being every where encompaſſed by columns; its elevation was 68 feet, its length 230, and its breadth 95. Its architect was Libon, a native of this country, the roof was of fine pentelic marble, cut in the form of tiles. From the middle of the roof hung a gilded victory, and under this ſtatue a golden ſhield, on which was repreſented Meduſa's head. On the outſide above the columns a rope went round the temple, to which were faſtened twenty-one gilt bucklers, conſecrated to Jupiter by Mummius, after the taking of Corinth. Within and about the temple were innumerable ornaments, conſiſting of ſtatues, paintings, and columns charged with trophies. Among the ſtatues were ſeveral of Parian marble, of which ſome had been erected in honour of the emperor Adrian by the cities which compoſed the ſtate of Achaia, and others to Trajan by the whole Greek nation. The city of Olympia was indebted to Trajan for ſeveral of its embelliſhments, particularly the baths, which bore his name, an amphitheatre, a horſe-courſe, two ſtadia in length, and a ſenate-houſe for the Roman magiſtrates, ceiled with bronze. Moſt of the Athletæ had their ſtatues at Olympia, ſeveral of which were executed by Phidias. For other particulars we refer to Pauſanias, lib. v.

OLYMPIAD, Ολυμπιας, in *Chronology*, a ſpace or period of four years; by which the Greeks reckoned their time.

Hiſtorians have ſaid that the Olympiad was inſtituted by Iphitus; but it is certain, that the tetracteris, or period of four years, was almoſt as old as the religions of Greece, being uſed in ſeveral of their ſacra, or religious feſtivals. From Scaliger (Animadv. ad Euſ. Chron. N° 1241.) we learn, that the Greeks, inquiring of the Delphic oracle concerning their ſolemn feaſts and ſacrifices, received for anſwer, that they would do well to ſacrifice καλα τα παλεια, και καλα τρια, according to the cuſtom of their fathers, and according to three things; which laſt words they interpreted to ſignify days, months, and years. They accordingly ſat themſelves to regulate their years by the ſun, and their months and days by the appearances of the moon. Thus they hoped to obſerve their feſtivals, and offer their ſacrifices upon the ſame days and the ſame months in the year; and thus to pleaſe the gods, and to fulfil the intention of the oracle. After trying many forms and combinations of years for this purpoſe, they made their year to conſiſt of 360 days, with two additional days, and their months of 30 days each, from one of which, however, in the courſe of four years, they took a day; by this means their tetracteris amounted to 1447 days. Sometimes a whole month was intercalated, and then the tetracteris conſiſted of 1477 days. In this way they flattered themſelves that the oracle was fulfilled; for they ſacrificed according to the year and the month, becauſe the month was full, as conſiſting of 30 days; and the years thus made up of complete months, by means of theſe intercalations, returned to their beginnings, nearly in the propoſed order. Hence it was, that the great feſtivals of the Greeks were ſolemnized every fifth year, after an interval of four complete years; as, *e. g.* the panathenæa at Athens, and the Olympic games in Elis, which were celebrated every fifth year upon the full of the moon. By Scaliger's tables it appears, that the Olympic new moon fell ſometimes in the middle, or latter end of July, and ſometimes in the beginning of Auguſt, for that feſtival never preceded the ſummer ſolſtice; which the ancients placed always upon the 9th of July, ſo that the Olympic moon was the firſt new moon after the ſummer ſolſtice. This gave birth to the intercalary month, and occaſioned the variation in the tetracteris, which conſiſted ſometimes of 48 months, ſometimes of 49. The utility of the Olympiad as an eſtabliſhed era in the Greek chronology and hiſtory is well known, and, indeed, Scaliger triumphs with no ſmall degree of exultation in the imagined ſucceſs of his reſearches with regard to this period. "Hail," ſays he, "venerable Olympiad! thou guardian of dates and eras! Aſſertrix of hiſtorical truth, and curb of the fanatical licentiouſneſs of chronologiſts! &c. &c." Nevertheleſs, chronologers are far from being agreed about the preciſe time at which the Olympiads began; ſome dating them from the victory of Coræbus the Elean, and others throwing their original 13, and even 28 Olympiads farther backward. This was done by artificial chronologers, who, in order to accommodate the Olympiads to their ſyſtems and computations, have added to their antiquity 112 years, as ſir Iſaac Newton obſerves, in his "Chronology." Chronologers, however, in all their computations, agree to reckon downward from that Olympiad in which Coræbus the Elean was conqueror, the firſt year of which was the 776th B. C., meaning, according to Scaliger, July the 23d. See EPOCHA.

Rome was built, according to Varro, in the fourth year of the ſixth Olympiad.

The Peloponneſian war began May the 7th in the ſecond year of the 87th Olympiad. Alexander the Great died April the 21ſt, in the ſecond year of the 114th; and Jeſus Chriſt was born in the fourth year of the 193d Olympiad, four years before the common era.

The Olympiads were alſo called *anni Iphiti*, from *Iphitus*, who inſtituted, or at leaſt renewed, the ſolemnity of the Olympic games.

We do not find any computation by Olympiads after the 364th, which ended with the year of Chriſt 440. Except that in a charter of our king Ethelbert, the years of his reign are ſaid to be reckoned by Olympiads.

OLYMPIAS, in *Biography*, a celebrated woman, was daughter of the king of Epirus, who married Philip, king of Macedonia, by whom ſhe had Alexander the Great. Her haughtineſs, and more probably her ſuſpected infidelity, obliged Philip to repudiate her, and marry Cleopatra, the niece of king Attalus. Olympias was ſenſible of this injury, and Alexander ſhewed his diſapprobation of his father's

meaſures, by retiring from the court to his mother. The murder of Philip, which ſome have attributed to the intrigues of Olympias, was productive of the greateſt extravagancies. The queen paid the greateſt honour to her huſband's murderer. She gathered his mangled limbs, placed a crown of gold on his head, and laid his aſhes near thoſe of Philip. The adminiſtration of Alexander, who ſucceeded his father, was in ſome inſtances offenſive to Olympias; but when the ambition of her ſon was concerned, ſhe did not ſcruple to declare publicly that Alexander was not the ſon of Philip, but that he was the offspring of an enormous ſerpent, who had ſupernaturally introduced himſelf into her bed. When Alexander was dead, Olympias ſeized the government of Macedonia; and, to eſtabliſh her uſurpation, ſhe cruelly put to death Aridæus, with his wife Eurydice, as alſo Nicanor, the brother of Caſſander, with a hundred leading men of Macedon, who were inimical to her intereſt. Such barbarities did not long remain unpuniſhed: Caſſander beſieged her in Pydna, where ſhe had retired with the remains of her family, and ſhe was obliged to ſurrender, after an obſtinate ſiege. The conqueror ordered her to be tried, and to be put to death. A body of 200 ſoldiers were ordered to put the bloody commands into execution; but the ſplendour and majeſty of the queen diſarmed their courage, and ſhe was at laſt maſſacred by thoſe who had been injured in themſelves, and in their families, by her tyranny. This happened about three hundred and ſixteen years before the Chriſtian era. Univer. Hiſt.

OLYMPICS, or Olympic *Games*, were ſolemn games, which laſted five days, famous among the ancient Greeks; inſtituted, according to ſome, by Hercules, in honour of Jupiter, and re-eſtabliſhed by Iphitus; and held at the beginning of every fifth year, that is, every 50th month, on the banks of the Alpheus, near Olympia, a city of Elis; to exerciſe their youth in five kinds of combats.

Theſe games became ſo conſiderable, that the Greeks made them their epocha; diſtinguiſhing their years by the returns of the Olympics.

Theſe games have been held in ſuch reputation, and they are ſo nearly connected with the hiſtory of the Greeks, that their vanity has induced them to aſcribe their origin or revival to the moſt venerable perſonages of antiquity, ſuch as the Idæan Hercules, Clymenus, Endymion, Pelops, and Hercules, the ſon of Alcmena; and in order to ſupport theſe different pretenſions, reaſons have been ſought for, and arguments produced from the religious rites and ceremonies, the laws and cuſtoms of this ſolemnity. Thus, Pauſanias ſays, that theſe games were ordered to be celebrated every five years, becauſe the brothers, called the Idæi Dactyli, of whom, the Idean Hercules was the elder, were five in number; to whom, in particular, as alſo to his four brothers, an altar was conſecrated at Olympia by Clymenus, who was deſcended from this Hercules, and is ſaid to have celebrated theſe games fifty years after the deluge of Deucalion. The claims of Endymion are founded on the name of his father Aethlius, who is ſaid to have given the appellation of Athletæ to thoſe who contended for the prize denominated Athlon, at theſe games. As for Pelops, this hero was held in ſuch high veneration at Olympia, that the Eleans in their ſacrifices gave him the preferment, even to Jupiter himſelf, for which they alleged the practice of Hercules, the ſon of Alcmena; to whoſe labours, as Pindar informs us, they were indebted for their olive-crown. The Eleans, not contented with a founder, who was mortal by his mother's ſide, have ſought a ſtill more noble and ancient origin, and have named for the authors of theſe games Jupiter and Saturn; who, as they pretend, in the very place where theſe games were afterwards celebrated, wreſtled with each other for the empire of the world. Others affirm, that they were inſtituted by Jupiter, in commemoration of his victory over the Titans; and that Apollo in particular ſignalized himſelf by gaining two victories, one over Mercury in the foot race, and another over Mars in the combat of the Cæſtus. The name of other heroes might be mentioned, who are ſaid to have celebrated theſe games; the laſt of whom was Oxylus, who came into the Peloponneſus with the Heraclidæ. After him followed ſo long an intermiſſion of the ſolemnity, that the memory of it was almoſt loſt.

As to the occaſions of celebrating the Olympic games, ſir Iſaac Newton is of opinion, that they were originally celebrated in triumph for victories; firſt by Hercules Idæus, upon the conqueſt of Saturn and the Titans; and then by Clymenus, upon his coming to reign in the Terra Curetum; then by Endymion, upon his conquering Clymenus; and afterwards by Pelops, upon his conquering Ætolus; and by Hercules, upon his killing Augeas; and by Atreus, upon his repelling the Heraclidæ; and by Oxylus, upon the return of the Heraclidæ into Peloponneſus. Theſe opinions may be very well ſupported by the teſtimonies of ancient authors. That they were celebrated on occaſion of funerals, is an opinion which is ſanctioned by a cuſtom, which, as we learn from Homer, Pindar, and all the Greek writers, prevailed very much in thoſe heroic ages. The expence of theſe games was ſometimes defrayed by the relatives and friends of the deceaſed, and ſometimes by the public, who enacted an anniverſary ſolemnization of games in honour of the deceaſed. To one or other of theſe cuſtoms was probably owing the original of the Olympic games, as well as of thoſe celebrated at the iſthmus of Corinth, at Delphi, Nemea, and indeed in every conſiderable town throughout all Greece. It is not eaſy to account for the preference given to thoſe celebrated at Olympia; but in this preference all the people of Greece acquieſced, and they agreed to beſtow the firſt honours on the Olympic conquerors. It cannot, however, be pretended, that theſe games were in any very high eſtimation before the time of their inſtitution by Iphitus; who reigned as king of Elis, 884 years B. C. and 108 years before what is vulgarly called the *firſt* Olympiad. Iphitus may, therefore, very juſtly be regarded as the founder of the Olympic games. The occaſion of their re-eſtabliſhment is ſtated as follows; Greece at that time being torn in pieces by civil wars, and waſted by a peſtilence, Iphitus, one of the deſcendants of Hercules, grandſon of Oxylus, and king of Elis, had recourſe to the oracle at Delphi for a remedy to the evils which afflicted the country; and was told by the Pythoneſs, that the ſafety of Greece depended upon the re-eſtabliſhment of the Olympic games; the non-obſervance of which ſolemnity had, as ſhe told them, drawn down the indignation of the god to whom it was dedicated, and of Hercules, the hero by whom it was inſtituted. She ordered him, in conjunction with the people of Elis, to reſtore the celebration of that feſtival, and to proclaim a truce or ceſſation of arms to all thoſe cities which were deſirous of partaking in the games. The other people of the Peloponneſus were ordered by the ſame Delphic deity to join with the Eleans, and to allow them to hold their feſtival, and for that purpoſe to proclaim a ceſſation of arms. The ſecurity and peace which the Eleans thus enjoyed, contributed to render their country rich and flouriſhing; while the other cities of Greece were deſtroying one another with mutual and inteſtine wars; and in this ſtate of tranquillity they were diſtinguiſhed by great ſimplicity and innocence of manners.

The office of "Hellanodick," or preſident at theſe games, was at firſt exerciſed by Iphitus alone, and for 200 years continued to be exerciſed by a ſingle perſon, who was always of the family of Oxylus; but in the 50th Olympiad, the ſuperintendency of the games was committed to two, choſen by lot out of the whole body of the Eleans; and in the 75th, the number was increaſed to nine. Two Olympiads afterwards, a tenth was added; and in the 103d Olympiad, the college of Hellanodicks conſiſted of twelve, correſponding to the tribes of the Eleans. Soon afterwards, the number of tribes and of the Hellanodicks was reduced to eight; but in the 108th Olympiad, they were reſtored to ten, and this number was permanent. The Hellanodicks, from the powers that were veſted in them, acquired great dignity and authority among the ſeveral people of Greece; and in the public execution of their office, they were clothed in purple robes, and carried in their hands, as the uſual enſign of magiſtracy, a wand or ſceptre. They took their ſtations at different parts of the ſtadium, and the ſenior had the precedency of the reſt. The place in which the Olympic games were exhibited was called the *ſtadium;* which ſee. The gymnaſtic exerciſes of which theſe games conſiſted were five (ſee GYMNASTICS); *viz.* the foot-race or *ſtadium*, wreſtling or *palé*, the *pentathlon*, the *cæſtus*, and the *pancratium;* which ſee reſpectively. Thoſe who were competitors in theſe exerciſes were denominated *athletæ;* which ſee. Thoſe who contended in the horſe-races were perſons of higher rank and conſideration than the athletæ; and the ſpectacle itſelf was more pompous and magnificent. There were properly but two kinds of horſe-races at Olympia, *viz.* the chariot-race, and the race of riding-horſes. See the article CHARIOT.

From the nature of the ſeveral exerciſes, of which the Olympic games conſiſted, it is natural to conclude, that every one, who fancied himſelf qualified for obtaining an Olympic victory, was admitted to contend for it. But if it be conſidered that the Olympic games were part of a religious feſtival, inſtituted in honour of the king and father of all the Pagan deities, and ſolemnized with the utmoſt ſplendour and magnificence, by pompous deputations from every ſtate of Greece, that they were attended, either from devotion or curioſity, by a vaſt multitude of people, and that a victory in theſe games was productive of many honours and immunities, we ſhall not be ſurpriſed to find that thoſe, who offered themſelves as candidates for the Olympic crown, were obliged to ſubmit to ſeveral previous conditions, and to paſs through ſuch an examination as would exclude all who ſhould in any degree appear unworthy of the honour of contending for the Olympic olive. Some time before the celebration of the games, they gave in their names to one of the Hellanodicks, and ſpecified the ſeveral exerciſes in which they propoſed to contend. Although the games themſelves laſted but five days, the preparation for them took up 30, which were employed in exerciſing the candidates. The previous preparation was very ſevere, and the exerciſes required were more laborious and intenſe than on any other occaſion. For theſe preparatory exerciſes a particular place was appointed, which was the old Gymnaſium at Elis, where the Hellanodicks attended every day. The candidates took an oath, that they had exactly performed every thing required of them, by way of exerciſe, for ten months, including the 30 days or month ſpent at Elis. On the opening of the games, the names of all the candidates were proclaimed by a herald, and they were required to anſwer the following interrogatories; *viz.* Were they freemen? Were they Grecians? Were their characters free from all infamous and immoral ſtains? The herald, having proclaimed ſilence, laid his hand upon the head of the candidate, and leading him in that manner along the ſtadium, demanded with a loud voice of all the aſſembly, "Is there any one, who can accuſe this man of any crime? Is he a robber or a ſlave? or wicked and depraved in his life and morals?" When the candidate had paſſed with honour through this public inquiry into his life and character, he was led to the altar of Jupiter, ſurnamed "Hercius," derived from *hercos* (ὅρκος), an oath, from his preſiding over oaths. Here the candidates were all ſworn upon the limbs of a boar, ſlain and cut up for that purpoſe, that they would not be guilty of any fraud or indirect action, tending to a breach of the laws relating to the Olympic games. They ſwore alſo to their ten months' previous preparation. Boys, as well as perſons of mature age, were allowed to be of the number of candidates. This was an innovation, introduced by the mere authority of the Eleans, in the 37th Olympiad. However, under the age of 12 years they were reckoned too young, and above 17 they were ranked in the claſs of men.

Ladies were not aſhamed to be reckoned in the number of candidates. For a long time, indeed, they were not ſo much as allowed to be ſpectators of theſe conteſts for glory; and they were liable to the puniſhment of being caſt headlong down the precipices of mount Typæus, if they aſſiſted at the ſolemnity, or paſſed the river Alpheus during the exhibition. The more effectually to reſtrain them, it was ordered that all the maſters of the gymnaſium, who aſſiſted at theſe games, ſhould appear naked, as were alſo all the Olympic candidates; which was without doubt the true reaſon of this law's being firſt made, as well as one of the principal cauſes of its having been ever religiouſly obſerved. It was, nevertheleſs, the peculiar privilege of the prieſteſſes of Ceres to be preſent. As a recompence to the women for their excluſion from the Olympic games, they had a feſtival of their own, inſtituted, as it is ſaid, in honour of Olympian Juno, by Hippodamia, the wife of Pelops. The virgins in this feſtival contended, properly and gracefully clad, in the foot-races; the courſe being ſhortened about one-ſixth part; and the conquereſs received for her reward an olive crown, and a certain portion of the heifer that was on this occaſion ſacrificed to Juno. But the moſt agreeable part of the recompence was the liberty granted to the victorious virgin to have her picture drawn, and hung up in the temple, as a memorial, at the ſame time, of both her beauty and her glory. The direction of this feſtival, and the office of preſiding at theſe games, was lodged in 16 matrons, elected for that purpoſe, two out of each of the eight tribes of the Eleans.

The firſt reward beſtowed upon the conquerors in the Olympic games, and the pledge of many conſequent honours, privileges, and immunities, was a chaplet or crown, compoſed of the branches of a wild olive. (See CROWN.) The laſt duty performed by the conquerors at Olympia was ſacrificing to the twelve gods, who were worſhipped two at one altar, and ſometimes to Olympic Jupiter in particular. Theſe ſacrifices were in ſome caſes performed ſo magnificently, as to entertain the whole multitude aſſembled on the occaſion. Others, leſs able or leſs vain, contented themſelves with entertaining only their own friends, or being feaſted by them, or perhaps by the Eleans themſelves, the ſuperintendants of the Olympic games. At theſe entertainments, a chorus, accompanied with inſtrumental muſic, ſung ſuch odes as were compoſed upon that occaſion in honour of the conqueror. Pindar compoſed odes for this purpoſe; but he demanded a high price for his performances. For perpetuating the glory of theſe victories,

the Hellanodicks entered into a public regiſter the names of the conquerors, with the exerciſe performed, the claſs of men or boys to which they belonged, and alſo the number of the Olympiad. They had alſo the honour of having their ſtatues ſet up in the Altis, or ſacred grove of Jupiter at Olympia. On their return to their own country, they were received with extraordinary tokens of reſpect and applauſe; and it was cuſtomary for the ſacred conquerors to make their entry through a breach in the wall; for which cuſtom Plutarch aſſigns this reaſon, *viz.* that a city which is inhabited by men, who are able to fight and conquer, has little occaſion for walls. The privilege of a public entry was occaſionally granted; but it was reſtricted to few. A ſtipend or ſalary was allotted to the ſacred conquerors by their reſpective cities; and it became due, according to the regulation made by Trajan, from the time of their public entry, and it was continued to them for the remainder of their lives. Another reward conferred upon theſe conquerors was the honour of the firſt ſeat at all public ſpectacles; beſides, they had preſents, and a yearly allowance of proviſions. The laſt privilege we ſhall mention was an immunity from all civil offices, which ſeems to have been owing to the Roman emperors. To the privileges and honours already recited were ſometimes added ſtatues, or other monuments of glory, inſcriptions, and even altars, upon which ſacrifices were offered to them as to heroes or demi-gods.

This celebrated inſtitution of the Olympic games maintained its reputation for a long period, and actually ſubſiſted for more than 1000 years. Its utility, therefore, in a variety of reſpects, muſt be unqueſtionable. It is obvious at firſt view, that this inſtitution excited and maintained ſuch an emulation and ardour to excel in all the various exerciſes which it comprehended, that there was ſcarcely a town of any note, either in Greece or many other countries, in which there was not a gymnaſium, or ſchool of exerciſe, ſupported at the public expence, with a view of training up their youth in a manner that was beſt ſuited, as they conceived, to make them uſeful to their country. The gymnaſtic exerciſes, of which the Olympic games conſiſted, contributed to increaſe the ſtrength and agility of the body, to render them dextrous and valiant in war, to furniſh a ſupply of cavalry when horſes were ſcarce, and the people unſkilful in the management of them, to give employment to thoſe whoſe circumſtances might otherwiſe have made them idle, to induce habits of ſobriety and temperance, (ſee Hor. Art. Poet. v. 412, and alſo 1 Corinth. ix. 25.) to diſcourage vice and immorality, to rouſe into exerciſe and keep alive the love of glory, to cheriſh and preſerve a due regard to the reputation of their families and countries, and to promote concord and union among the different people of Greece. Such are ſome of the principal benefits that reſulted from the inſtitution of the Olympic games. To thoſe who wiſh to ſee them ſtated more in detail, we recommend the peruſal of "A Diſſertation on the Olympic Games," by Gilbert Weſt, eſq. LL.D. For the muſical conteſts at the Olympic games, ſee GAMES.

OLYMPIC *Fire*. See FIRE.

OLYMPICI, GLI, the title of the academiſts of Vicenza, in Italy. See ACADEMY.

OLYMPINION, or NEW ATHENS, in *Ancient Geography*, a town of the iſland of Delos, ſo called by its founder, the emperor Adrian. It contained a temple of Hercules, and another conſecrated to Neptune; which without doubt were magnificent, as Adrian employed only Athenians in the conſtruction of them.

OLYMPIODORUS, in *Biography*, an Alexandrian philoſopher, who flouriſhed about the year 430, is celebrated for his knowledge of the Ariſtotelian doctrine, and was the maſter of Proclus, who attended upon his ſchool before he was 20 years of age. This philoſopher is diſtinguiſhed from a Platoniſt of the ſame name, who wrote a "Commentary upon Plato," which was preſerved among the MSS. in the royal library at Paris; and "A Life of Plato," of which a Latin verſion was publiſhed by Wendet, with learned notes. He is alſo diſtinguiſhed from a Peripatetic of a ſtill later age, who wrote a commentary upon the Meteorology of Ariſtotle. Enfield's Hiſt. Phil.

OLYMPIODORUS, a learned Greek commentator on the Holy Scriptures, who was probably at firſt a monk, and afterwards became a deacon of Alexandria. It is not at all aſcertained with accuracy as to the time when he flouriſhed; ſome placing him in the ninth, others in the eleventh century; but Cave ſays he ought not to be placed later than the early part of the ſixth. He is praiſed for the excellence of his ſermons, with which he edified the church at Alexandria, as well as by the talents which he diſcovered in the elucidations of the ſacred writings. There are extant by him a ſhort "Commentary on Eccleſiaſtes," in Greek and Latin; "A Commentary upon the Lamentations of Jeremiah," publiſhed at Rome, with Origen's Commentary, 1598, 4to.; and "A Commentary upon the Book of Job," the beſt edition of which was publiſhed at London, by Patricius Junius, 1637, folio. Moreri.

OLYMPIONICES, Ολυμπιονικης, in *Antiquity*, an appellation given to thoſe who came off victorious in the Olympic games.

The Olympionices were infinitely honoured in their country, as being eſteemed to have done it immortal honour. The Athenians particularly were ſo laviſh in their preſents to the Olympionices, their countrymen, that Solon found it neceſſary to reſtrain their liberality by a ſpecial law, which imported, that the city ſhould only give 500 drachmas to the Olympionices; which amounted to about 58 ounces of ſilver of our weight. See OLYMPICS.

OLYMPIS, in *Ancient Geography*, a ſtrong place on the Peloponneſus, near the mountains, on the confines of Laconia and the Argolide. Polybius.

OLYMPIUM, a ſmall town of Sicyonia, eaſt of Aſopus, and at a ſmall diſtance from its mouth. It was famous for the tomb of Eupolis, an Athenian poet, mentioned by Horace, as one of the beſt authors in the department of the ancient Greek comedy.

OLYMPUS, in *Biography*. There were two great muſicians in antiquity of the name of Olympus. The firſt was of Myſia, who is ſuppoſed to have been the inventor of the Orthian mode: others give it to the younger Olympus. This was the nome, according to Herodotus and Aulus Gellius, that Arion ſung, when he precipitated himſelf into the ſea. Plutarch ſays, that he was the chief and the maſter of beautiful and ſublime muſic: he excelled in the tender and pathetic. Philoſtratus made him the ſubject of one of his pictures.

OLYMPUS, *Myſian*, lived before the Trojan war, and was the diſciple of Marſyas. Plato, Ariſtophanes, Ariſtotle, and Ovid, cite his verſes. Olympus the Phrygian lived in the time of Midas.

Ariſtoxenus relates that he compoſed, in the Lydian mode, the air for the flute which expreſſed the funereal ſorrows for the death of Python. To him likewiſe are aſcribed the Cerulean, Minervan, Harmatian, and Spondean modes. Plutarch, in his Dialogue on Muſic, informs us that Alexander, in his "Hiſtory of the Muſicians of Phrygia," pretends that Olympus was the firſt who introduced

duced the Greeks to the knowledge of ſtringed inſtruments; and that he inſtituted the cuſtom of celebrating, with the flute, hymns to the polycephalic nome, in honour of the gods.

Plato ſays, that his muſic inflamed his auditors; Ariſtotle, that it exalted the ſoul; and Plutarch, that it ſurpaſſed in ſimplicity all other muſic. Plutarch alſo attributes to him the polycephalic nome, in honour of Apollo; though others aſcribe it to Crates.

Olympus, in *Ancient Geography*, a name given to ſeveral lofty mountains, and thence transferred to the heavens. Le Clerc derives it from "Holamimbo," *immortales in eo;* but the abbé Bergier deduces it from the oriental "Lop," or "Lup," ſignifying *elevation*. According to Heſychius, the number of theſe mountains was fourteen; and ſeven have been particularly noticed by geographers. Homer always diſtinguiſhes Olympus as the habitation of the gods, alluding occaſionally to the mountain which ſeparated Macedonia from Theſſaly, and which was one of the mountains beſt known to the ancients, and deſcribed by European geographers under this name. As Athos (which ſee) aſtoniſhed obſervers by its bulk, Olympus ſtruck the beholder with a kind of reverence by its amazing elevation, and at the ſame time invited his aſcent by the beauty and variety of the proſpects which it afforded. The river Peneus, one of the cleareſt, gentleſt, and moſt beautiful ſtreams in the univerſe, waſhed its foot, dividing it from Oſſa, and making a multitude of ſmall, but delightful iſles, covered with ſhady trees, and adorned with magnificent temples, grottos, porticos, and other ſtately buildings. On the ſouth-eaſt ſide of the hill ran the famous river Helicon, and near it ſtood a noble temple of Jupiter, in the midſt of a ſhady grove. The mountains Oſſa and Pelion were in the neighbourhood, and very conſiderable for their height, though they fell far ſhort of Olympus. Sonnini has particularly deſcribed his aſcent to the ſummit of this mountain. On the ſide of the mountain, and at the firſt ſtage of aſcent, is the village called "Skala;" above which the acclivity, which was below it gentle, becomes rugged and ſteep. In this village is a Greek convent, from which the proſpect is extenſive and magnificent, commanding on one ſide the ſea, the neighbouring coaſts of mount Athos, and the numerous iſlands which diverſify it; and on the other, the beautiful plains of Macedonia. The foreſt by which the monaſtery of Skala is ſurrounded is compoſed of pines, firs, oaks, elms, beeches, hollies, cheſnut trees, &c. and inhabited by wild boars, ſtags, roe-bucks, bears, and birds of different ſpecies. The vicinity is expoſed to the attacks and ravages of Albanian robbers; and Sonnini and his companions eſcaped, by feigning themſelves to be foreign phyſicians, who were in ſearch of plants on the mountain, that would furniſh remedies for a variety of diſeaſes. The aga or commander of the plundering band, labouring under a complaint, applied to them for relief; and thus they avoided the danger to which they were expoſed. In aſcending beyond Skala, our travellers ſtopped at another monaſtery, three leagues from the former: this bears the name of St. Dennis, to whom it is conſecrated. Here the mountain is divided into ſeveral ſteep points, and the building is ſurrounded by thoſe towering pinnacles, that are almoſt entirely compoſed of rocks. In this place are a grotto, or ſmall chapel, ſaid to have been built by St. Dennis himſelf; a hut which ſerved him as a retreat; and at the extremity of the grotto, a ſpring iſſuing from a torrent in the rock, and which, as the fable ſays, the ſaint forced to appear by ſtriking the rock with his cap. The ſmall church of this convent is tolerably handſome; a large beautiful luſtre of bronze, made in Germany, is ſuſpended to the roof. A ſmall library of Greek and Latin books, printed in the ſame country, and well choſen, occupies a chamber of the monaſtery, and being little uſed, will long be preſerved in good condition. Many other articles are brought hither from neighbouring civilized countries, and particularly a large clock, which, though of a common ſort, is an object of admiration in all theſe diſtricts. Above this inſulated convent, ſituated in a very wild place, there are no more habitations on mount Olympus. Our travellers, as they advanced towards the ſummit, ſoon met with large heaps of ſnow; and here the guides waited their return, kindling a large fire, as the cold was very ſharp at this height. Clambering amidſt clumps of trees, and clinging to the branches of ſhrubs, which became ſcarcer as they got higher, and to the projections of rocks, they continued their aſcent, till at length the mount became naked, and preſented only a cap of ſnow and ice, on which it was impoſſible for them to be ſuſtained or walk. "Is it not aſtoniſhing," ſays M. Sonnini, "that the Greeks have placed the abode of the gods on an eminence which mortals cannot reach?" At this time it was the middle of July: the heat was extreme towards the baſe of the mountain, as well as in the plain; and the maſſes of ſnow, which were condenſed near its ſummit, did not appear to be on the point of melting. However it is ſaid, that in the month of September no more ſnow is ſeen on Olympus; an aſſertion which our travellers did not credit, and which was contradicted by the teſtimony of the Greek monks, who have ſucceeded the gods on this great elevation of the globe, and who confirmed what will ſcarcely be doubted, the perpetual permanence of ſnow and ice on the top of the mountain. It is impoſſible, we are told, to conceive the immenſe extent of different countries which a view from the top of Olympus embraces: it ſeemed to touch Pelion and Oſſa, which form another chain of mountains; and the vale of Tempé, which the ancient poets have deſcribed as a place of delight, appeared to be a very narrow gorge; and the river Peneus, which waters it, a ſtreamlet of water ſcarcely perceptible. At the monaſtery of Skala, the temperature is mild, vegetation vigorous, and the number of animated beings greater than the frozen ſummit of Olympus afforded, with the exception of bouquetins, native inhabitants of the rocks, and a few bears. There are hardly any quadrupeds to be ſeen beyond the half of the height of Olympus: ſcarcely do birds paſs this limit. The other ſix mountains which bear the ſame name, are thoſe of Theſſaly, Myſia, Cilicia, the Elide, Arcadia, and the iſle of Cyprus. See Olimpo.

Olympus, a promontory of the iſle of Cyprus, before Carpaſia, where was a temple of Venus *Acræa;* now called "Santa Croce."

The *Myſian* Olympus was a chain of mountains, commencing north of and near to the ſource of the Hermus, and extending from ſouth to north, as far as Bithynia. It bears now the ſame name.

Olympus, a town of Illyria.—Alſo, a town of Aſia, in Pamphylia.—Alſo, a town of Aſia Minor, in Lycia, near the ſea, between Phaſelis and the promontory of Hieron, which did not ſubſiſt in the time of Pliny; though Strabo deſcribes it as a large city, one of the principal towns of Lycia, in the vicinity of a mountain of the ſame name.—Alſo, a mountain of the iſle of Leſbos.—Alſo, a mountain of Lydia.—Alſo, a mountain of Lycia.—Alſo, a mountain of Aſia, near Antandros, and joining mount Ida, &c. &c.

OLYNTHUS, a town of Thrace, in the Paraxia, at the bottom of the Toronæan gulf, between the peninſula of Pallené and Sinthonia. This town was poſſeſſed by the

Greeks, originally from Chalcis of Eubœa. It arrived at a high point of proſperity and grandeur, and had frequent quarrels with Athens, Lacedæmon, and the kings of the latter ſtate, particularly Philip, who deſtroyed it, ſo that it was never completely re-eſtabliſhed. This deſtruction took place in the year 384 B.C.; and from an epigram of Antipater of Sidon, who lived about the year 146 before that era, it appears that it had a kind of renewal, by ſome power of which we have no certain account, nor do we know how long it laſted.

OLYRA, in *Botany*, a name borrowed by Linnæus for the preſent genus, and taken from the ancient ολυρα of Homer, Herodotus, and other Greek authors, amongſt whom it was conſidered to be a fine ſort of *corn* or *grain*, as we learn from the claſſical adjective ολυριτης, (when joined with εγκρυφιας), ſignifying, *bread made of the fineſt flour*. Linn. Gen. 482. Schreb. 624. Willd. Sp. Pl. v. 4. 204. Swartz Obſ. 346. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 325. Juſſ. 33. Lamarck Dict. v. 4. 546. Illuſtr. t. 571. Loureir. Cochinch. v. 2. 551.—Claſs and order, *Monoecia Triandria*. Nat. Ord. *Gramina*.

Gen. Ch. Male flowers beneath the female. *Cal.* Glume ſingle-flowered, of two, equal, lanceolate valves; outer rather ventricoſe, terminating in a capillary, ſtraight, ſmooth awn; inner narrower, acute, folded in on both ſides. *Cor.* none. Nectary very ſmall, of two, obovate, nearly emarginate, membranous, erect leaves. *Stam.* Filaments three, capillary, very ſhort; anthers linear, acute at both ends. Female flowers ſolitary, terminal, in the ſame panicle, much larger than the males. *Cal.* Glume ſingle-flowered, large, ſpreading, of two, nearly equal, ovate, concave, ribbed valves; outer terminating in a long, awl-ſhaped, ſomewhat waved awn, villoſe at the lower part; inner narrower, pointed. *Cor.* Glume of two unequal valves, much ſhorter than the calyx, coriaceous, ſhining, beardleſs, obtuſe. Nectary very ſmall, of three, obovate, membranous, erect leaves. *Piſt.* Germen ſuperior, oblong; ſtyle thread-ſhaped, cloven, almoſt as long as the calyx; ſtigma capillary downy. *Peric.* none, except the hardened glume of the corolla deciduous with the ovate, cartilaginous *ſeed*.

Eſſ. Ch. Male, Calyx-glume ſingle-flowered, awned. Corolla none. Female, Calyx-glume ſingle-flowered, ſpreading, ovate, awned. Glume of the corolla two-valved, beardleſs. Style cloven. Seed cartilaginous.

1. O. *paniculata*. Willd. n. 1. Swartz Obſ. 347. (O. latifolia; Linn. Sp. Pl. 1379. Amœn. Acad. v. 5. 408. Gramen paniceum majus, ſpica ſimplici lævi, granis petiolis inſidentibus; Sloane Hiſt. Jam. v. 1. t. 64. f. 2.)—Stem branched. Panicle terminal.—Native of Jamaica in dry, ſhrubby places, flowering from January to June. *Roots* thread-ſhaped, long, rather thick. *Stem* erect, a fathom high, jointed, round, branched at the lower part; joints ſimple. *Leaves* ſheathing, ſlightly ſtalked, broadiſh-lanceolate, pointed, horizontal, ſpreading, ſmooth, ſtriated; ſheaths downy. *Panicle* terminal, erect, ſpreading, many-flowered, its branches angular, rough, wavy.

2. O. *pauciflora*. Willd. n. 2. Swartz Prodr. 21. Ind. Occ. v. 1. 125. (Gramen floribus axillaribus, foliis ovatis; Loeſl. It. Amer. 243.)—Flowers axillary.—Native of woods in Jamaica, where it flowers in the ſpring. *Roots* very long, capillary, rather hairy. *Stems* aggregate, about a foot high, ſpreading, nearly erect, ſimple, jointed, round, ſlender, ſmooth. *Leaves* ſheathing, alternate, ſtalked, ovato-lanceolate, acute, ſlightly ſtriated, downy, rough at the margin; ſheaths a little hairy. *Flower-ſtalks* lateral from the ſheaths, thread-ſhaped, ſhort, bearing both male and female flowers.

3. O. *orientalis*. Willd. n. 3. Loureir. Cochinch. v. 2. 552.—Stem triangular. Spikes compound. Seeds triangular, rough.—Native of fields in Cochinchina. *Stem* about four feet high, erect. *Leaves* awl-ſhaped, long, partly embracing the ſtem. *Flowers* in compound ſpikes. *Seeds* triangular or roundiſh, white, large.

OLYSSA, in *Geography*, a town of the iſland of Crete. Strabo.

OLZIANY, a town of Lithuania; 30 miles S.S.E. of Wilna.

O'M, among *Hindoo Myſtics*, is a monoſyllable of very profound import. It is ſuppoſed to be a name or an emblem of the Deity, and ſo holy and awful, like the name Jehovah of the Jews, as not to be guiltleſsly pronounced, even by a prieſt. It muſt be contemplated, or recited mentally; and it then is ſaid to excite very efficacious aſpirations. This awful monoſyllable is triliteral, and perhaps therefore better written AUM, for three Sanſcrit letters do in fact compoſe it: but in compoſition, to avoid cacophony, A and U coaleſce in O. The firſt letter is ſuppoſed to be ſymbolical of Brahma, the creative power of the Deity; the ſecond of Viſhnu, the preſerver; and the laſt of Siva, the deſtroyer or renovator: for Hindoo philoſophers maintain that deſtruction is only reproduction in another form. (See SIVA and VISHNU.) As all the inferior deities of the Hindoos are avataras or manifeſtations of, and reſolve themſelves into thoſe three ſuperior powers, ſo thoſe ſuperior powers reſolve themſelves ultimately into Brahm, or the ſupreme being, of whom the ſun is the moſt perfect and glorious murti, or image. (See MURTI.) A combination of the three ſymbolical letters forms, therefore, a hieroglyphical repreſentation of the union of the three powers or attributes, and a word that, if uttered, would be nearly expreſſed by our letters AUM, or OOM, dwelling a little on each letter. A name of Parvati, the conſort of Siva, is Uma, or Ooma, and it is perhaps hence derivable; as well as Omkar, one of the moſt ſacred places of pilgrimage in India, dedicated to the worſhip of this myſterious union. See PARVATI.

In the Inſtitutes of Menu (ſee MENU) many verſes occur denoting the importance of this monoſyllable, and of a text of the Veda cloſely connected with it, called the Gayatri; reſpecting which we ſhall in this article include alſo what we have to offer; together with ſome remarks on ſimilar myſticiſms obſervable in other people. Among thoſe verſes are the following:

Chap. ii. v. 74. "A Brahman beginning and ending a lecture on the Veda, muſt always pronounce to himſelf the ſyllable OM: for unleſs the ſyllable OM precede, his learning will ſlip away from him; and unleſs it follow, nothing will be long retained." A commentator on this verſe ſays, "As the leaf of the *palaſa* is ſupported by a ſingle pedicle, ſo is this univerſe upheld by the ſyllable OM, a ſymbol of the ſupreme Brahm."

76. "Brahma milked out, as it were, from the three Vedas, the letter A, the letter U, and the letter M, which form by their coalition the triliteral monoſyllable, together with three myſterious words, *bhur*, *bhuva*, and *ſwer*." Theſe words mean earth, ſky, and heaven, and are called the vyahritis.

77. "From the three Vedas, alſo, the Lord of creatures, incomprehenſibly exalted, ſucceſſively milked out the three meaſures of that ineffable text, beginning with the word *tad*, and entitled Savitri or Gayatri.

78. "A prieſt who ſhall know the Veda, and ſhall pronounce to himſelf, both morning and evening, that ſyllable, and

and that holy text preceded by the three words, ſhall attain the ſanctity which the Veda confers.

79. "And a twice born man who ſhall a thouſand times repeat thoſe three, (OM, the vyahritis, and the gayatri,) apart from the multitude, ſhall be releaſed in a month even from a great offence, as a ſnake from his ſlough.

80. "The prieſt, the ſoldier, and the merchant, who ſhall neglect this myſterious text, and fail to perform in due ſeaſon his peculiar acts of piety, ſhall meet with contempt among the virtuous.

81. "The great immutable words preceded by the triliteral ſyllable and followed by the gayatri, which conſiſts of three meaſures, muſt be conſidered as the mouth or principal part of the Veda.

82. "Whoever ſhall repeat, day by day, for three years, without negligence, that ſacred text, ſhall hereafter approach the divine eſſence, move freely as air, and aſſume an etherial form.

83. "The triliteral monoſyllable is an emblem of the Supreme, the ſuppreſſions of the breath with a mind fixed on God are the higheſt devotion; but nothing is more exalted than the gayatri."

The ſuppreſſion of the breath is thus performed by the prieſt: cloſing the left noſtril with the two longeſt fingers of the right hand, he draws his breath through the right noſtril; then cloſing that noſtril likewiſe with his thumb, holds his breath while he meditates the text: he then raiſes both fingers off the left noſtril, and emits the ſuppreſſed breath, having, during its ſuppreſſion, repeated to himſelf the gayatri, the vyahritis, the triliteral monoſyllable, and the ſacred text of Brahm. By an ancient legiſlator it is ſaid to imply the following meditation: "OM! earth! ſky! heaven! manſion of the bleſſed! abode of truth! —*We meditate on the adorable light of the reſplendent Generator which governs our intellects:* which is water, luſtre, ſavour, immortal, faculty of thought, Brahm, earth, ſky, heaven." The words which we have diſtinguiſhed by italics are very nearly the gayatri.

Chap vi. v. 70. "Even three ſuppreſſions of breath, made according to the divine rule, accompanied by the triverbal phraſe (*bhurbhuvaswah*), and the triliteral ſyllable (OM), may be conſidered as the higheſt devotion of a Brahman.

71. "For as the droſs and impurities of metallic ores are conſumed by fire, thus are the ſinful acts of the human organ conſumed by the ſuppreſſion of breath, while the myſtic words and the meaſures of the Gayatri are revolved in the mind."

This may ſuffice to ſhew the veneration in which this "myſtic monoyllable" and "ineffable text" are held by Brahmans and Hindoos in general, on the authority of their moſt revered legiſlator Menu. Others of their moſt ſacred books confirm them in this veneration. In the Gita, Kriſhna, deſcribing his own excellencies, ſelects the firſt and beſt of many things wherewith to compare himſelf. "I am," he ſays to Arjun, "the monoſyllable among words." "Amongſt harmonious meaſures I am the Gayatri." See KRISHNA and SRI BHAGAVAT.

The extreme importance that the Hindoos attach to the gayatri, renders it a text of more curioſity than perhaps a general reader will be able to diſcover in the words themſelves, in either their familiar or recondite meaning. It is, like the holy monoſyllable, to be mentally revolved, never articulated. It is taught, as we have ſeen in the preceding extracts from Menu, to the three firſt claſſes, that is, to the Brahman or prieſthood, to the Kſhetriya or ſoldier, and to the Vaiſya or merchant; but not to the Sudra or labourer, nor to individuals of the three firſt-named claſſes, if rendered by vicious propenſities unworthy of the "ſecond birth," promiſed in the holineſs of this myſterious regeneration. Faſting, ablution, prayer, almſgiving, and other commendable acts, are neceſſary preliminaries and accompaniments to initiation in the myſteries of this "ineffable text," which is done by the Guru, or ſpiritual preceptor, in a reverent and ſecret manner. In the Vedas the text occurs ſeveral times, and tranſlations of it by different Sanſcrit ſcholars are given, with many particulars of it and other myſterious points, in the Hindoo Pantheon. "There is no doubt," ſays the author of that work, "but that pious Brahmans would be very deeply ſhocked at hearing the gayatri defiled by unholy articulation, even if expreſſed in the moſt reſpectful manner; and many would be diſtreſſed at knowing the characters, ſound, and meaning, to be in the poſſeſſion of perſons out of the pale of ſanctity. A gentleman on the weſtern ſide of India, unaware of the reſult, began once to recite it audibly in the preſence of a pious Pandit: the aſtoniſhed prieſt ſtopped his ears, and haſtened terrified from his preſence. I ſhould be ſorry, for my own part, if it were revealed ſo as to incur the liability of utterance by inconſiderate individuals, who might thereby wound the feelings of many good and reſpectable men; its promulgation, while probably diſtreſſing to many, would anſwer no deſirable end to ſcience or literature." Page 410. In the frontiſpiece to that work, the character or ſymbol is given that would, if uttered, yield the ſound of OM. The author ſays he once ſhewed it to a Brahman, who ſilently averted his face, evidently pained by what he unwillingly ſaw.

It has been doubted if any except Brahmans were initiated in the ſuppoſed myſteries of this holieſt text. From the extracts given above from the Inſtitutes of Menu, it is clear that the gayatri, ſo far as regarded the words of the text, was taught, with certain exceptions, to three out of the four claſſes or tribes of Hindoos. How far any but Brahmans are initiated in its ſuppoſed myſteries, is another queſtion, and not perhaps eaſily ſolved. But it may be here proper to remark, there is a plurality of gayatris, although their differences have not been hitherto developed. "The white goddeſs, or Saraſwati, preſides over arts and ſciences: ſhe is the Vedas, and the Vedas are in her. (See SARASWATI). Savitri, the conſort of Brahma, is the gayatri, emphatically called the mother of the Vedas. The gayatri conſiſts of certain myſterious words, which are conſidered as the quinteſſence of the Vedas. The three ſuperior claſſes are regenerated, or born again, as they ſay of the gayatri; in the ſame manner that we are born again of the ſpirit and water: and the myſterious name of the holy Trinity is really our gayatri. From this regeneration Brahmans are called Dwija, or twice born. The neceſſity of regeneration is a fundamental tenet among divines in the eaſt as well as in the weſt. There are five different gayatris, according to the number of the principal deities, which are Viſhnu, Siva, the Sun, Devi, and Ganeſa. That of the ſun is the firſt, and belongs excluſively to the ſacerdotal claſs." Aſ. Ref. vol. xi. art. 2.

Hence it may be reaſonably inferred that there are different degrees of initiation in the free maſonry of the gayatri. That of Surya, or the ſun, with its eſoteric alluſions and meanings, is apparently taught to prieſts only. The powers of creation, preſervation, and renovation, united and ſymbolized in the myſtic OM, appear by the effects produced to exiſt in a peculiar degree in the ſun, and to this object adoration ſeems to have been paid by all people of whom any remote record hath reached us. (See IDOLATRY.) But the Brahmans deny ſuch adoration: affirming that it is to the "incomparably greater Light," typified by the ſun-

that

that their devotions are directed. This indeed the commentaries on the gayatri uniformly confirm. See SURYA.

Sir W. Jones ſays that the gayatri is called the "Mother of the Vedas." This we apprehend is to be taken inductively; the Vedas proceeded from Brahma, or from his ſakti or coequal power or conſort Saraſwati, who is named Savitri, as is alſo both the gayatri and the ſun. In the concluſion of the preface to the Inſtitutes of Menu, is a tranſlation, the words in Italics being thoſe immediately of the text. "The many panegyrics on the gayatri, the mother, as it is called, of the Vedas, prove the author (Menu) to have adored, not the viſible material ſun, but that *divine and incomparably greater light, which illumines all, delights all, from which all proceed, to which all muſt return, and which alone can irradiate* (not our viſual organs merely, but our ſouls and) *our intellects*. Theſe may be conſidered as the words of the moſt venerable text in the Indian ſcripture."

Another tranſlation occurs in the laſt volume of his works, in which he ſeems to have intended making the tranſlation as literal as poſſible.

"The gayatri, or holieſt verſe of the Vedas: Let us adore the ſupremacy of that divine ſun, the godhead, who illumines all, who recreates all, from whom all proceed, to whom all muſt return; whom we invoke to direct our underſtanding aright in our progreſs toward his holy ſeat."

The following paraphraſe or commentary, is by a learned Brahman named Rhadakant, of whom honourable mention is often made by his illuſtrious pupil, the early loſs of whom all lovers of virtue and learning, of oriental learning and literature eſpecially, unite in deploring. "Perfect truth; perfect happineſs; without equal; immortal; abſolute unity; whom neither ſpeech can deſcribe, nor mind comprehend; all pervading; all tranſcending; delighted with his own boundleſs intelligence, not limited by ſpace or time; without feet, moving ſwiftly; without hands, graſping all worlds; without eyes, all-ſurveying; without ears, all-hearing; without an intelligent guide, underſtanding all; without cauſe, the firſt of all cauſes; all-ruling; all-powerful; the creator, preſerver, transformer, of all things.—Such is the great one: this the Vedas declare." The reader may be amuſed and edified by comparing this Brahmanical deſcription of the Deity, with that of ſir Iſaac Newton, given under the article GOD of this work.

We are induced to give another tranſlation of this revered text, together with the prayer which contains it, and that which precedes it, by Mr. Colebroke, the learned preſident of the Aſiatic Society. It occurs in the laſt hymn of the third book of the firſt, or Sama, Veda. This appears to be its proper and original place; for although it occurs alſo in other Vedas, yet here it is included with invocations by Viſwamitra, the ſage or Riſhi to whom it was revealed. (See RISHI and VISWAMITRA.) "This new and excellent praiſe of thee, O ſplendid playful Sun! is offered by us to thee. Be gratified by this my ſpeech; approach this craving mind, as a fond man ſeeks a woman. May that Sun who contemplates, and looks into, all worlds, be our protector.

"*Let us meditate on the adorable light of the divine ruler*—(Savitri).—*May it guide our intellects*. Deſirous of food, we ſolicit the gift of the ſplendid ſun (Savitri) who ſhould be ſtudiouſly worſhipped. Venerable men guided by the underſtanding, ſalute the divine ſun (Savitri) with oblations and praiſe."

The paſſages which we have diſtinguiſhed by italics appear to contain the whole of the gayatri; and with their context are ſufficient to prove that the Hindoos, eſoterically, are not polytheiſts. But it is not eaſy to diſcover why the text ſhould be fancied ſo very profound, or why it ſhould be kept ſecret; for its expoſition, unconnected with the idea of myſtery, does not ſeem likely to have the effect, ſo dreaded by prieſts, of "guiding the intellects" of the multitude to the diſcovery of truth.

We have thus offered, under one article, what we wiſhed to ſay on thoſe two myſterious words *Om* and *Gayatri*. However puerile ſuch myſticiſms may appear to a certain claſs of philoſophers, it cannot be otherwiſe than intereſting to thoſe inquiſitive as to the varieties and coincidences in the human mind, to trace them among remote people and back to remote ages. What is received with myſterious awe by millions of intelligent beings, cannot be wholly undeſerving the ſcrutiny of philoſophy; and where the wiſeſt of refined people diſtant from, and unconnected with, each other, agree in ſuch viſionary reveries, as we may, if we pleaſe, call them, the reſult of an enquiry into their origin and diffuſion may perhaps repay the trouble of reſearch. We ſhall, in this place, however, merely throw out a hint to invite attention on the part of thoſe who have more time and inclination to devote to ſuch points, than we profeſs to have.

As in all languages the letter equivalent to A is the initial, or firſt of the alphabet, ſo, with moſt lettered nations, it has been ſuppoſed to ſignify things primary. Among ancient writers, alpha or aleph was uſed to denote the chief or firſt man of his claſs or rank. By ſome it was applied to Moſes; by many to ſomething myſterious or divine; thence to the Deity. In the ſacred writings we find the Lord ſaying, "I am *alpha* and *omega*, the beginning and the end, the firſt and the laſt." Theſe two letters were hence formed, by myſtical reſearches, into a ſort of hieroglyphic, or ſymbol of the Deity, and afterwards of Chriſtianity, and as ſuch was engraved on the tombs of the early Chriſtians, to diſtinguiſh them from thoſe of idolaters. Thus we find the Hindoo ſacred writings put the ſame words into the mouth of *Kriſhna*, as cited under that article. "I am," he ſays to Arjun, "of things tranſient, the beginning, the middle, and the end." "I am the monoſyllable among words." This monoſyllable OM is the combined alpha and omega of the Brahmas. Without laying any ſtreſs on it, it may be obſerved in paſſing, that thoſe initial and final letters would, combined, yield nearly the monoſyllable ſound in queſtion. Initial and final letters have thus, by poſition, become myſterious with many people. In Sanſcrit the word *agam* contains the important letters, and the word accordingly is found to mean *ſecret, hidden, myſterious*. The Hindoos have an occult work, entitled Agama Saſtra, or Myſterious Ordinances. The ſame work *agam*, or *ogham*, has the ſame meaning, we are told by general Vallancey, in the Iriſh tongue; and in the 14th vol. of the Archæologia, are ſome learned obſervations by the Rev. Stephen Weſton, on the *Ogm*-ian Hercules of Lucian, in which the identity of the Sanſcrit and Iriſh words, and their connection with the obſcure God, is maintained.

The ſimilarity of the languages of the Arabians and Hebrews, and the common origin of the law of thoſe people, lead us to expect a like ſimilarity in their notions, as to the myſterious import of certain letters. Such notions were, and are, of extenſive prevalence among them. We have already ſhewn the myſticiſms of the Hindoos touching firſt and laſt letters, their "triliteral monoſyllable," their "triverbal phraſe," &c. triunities. With the Arabs and Jews the alphabetic initial is the initial and final, the firſt and the laſt, like the alpha and omega of the Greeks, of one their names of God, and is regarded as of peculiar ſanctity. It has occurred to us that the myſterious paſſage in Exodus, אהיה אשר אהיה, hath derived ſome of its myſtic im-

port

port from the common propenſity of mankind to ſee ſomething profound in the form and poſition of letters. Number has, of courſe, as well as form and poſition, a like alluſion; and, of all numbers, *three* and *one* bear the palm of myſticiſm with a curious variety of people. Thus the initial aleph and alpha denoting one, denoted alſo, like the ſingle jod of the Hebrews, and the dot or point of the Hindoos, the unity of the Supreme. Three in combination were very myſtical, either as finals or initials; nor was a medial poſition wholly unimportant. The ש, *ſhin*, exhibiting three jods comprehended in one, was not held to be unmeaning or indifferent. The trident of the weſtern Neptune, and the triſula of the eaſtern Siva, have been ſuppoſed to be connected with the alluſions of this typical letter. This triune emblem denotes dominion over earth, ſky, heaven, the triverbal *bhurbhuvaſwah*, the "great immutable words," as we have ſeen, of Menu, the Hindoo lawgiver.

Without prying farther into theſe fancied myſteries, let us look, for a moment, at the above obſcure text in Exodus, uttered, under awful circumſtances, by the Deity, in unity of perſon. In our verſion it is rendered "I AM that I AM," Ex. iii. 14. The emphatic words are uſually printed in capitals. Paſſing by the meaning of the text, we ſee, in the original, compoſed a triverbal phraſe of triliteral monoſyllables, each of the three words beginning with a myſtic initial of unity, the myſtical letter of triunity being preciſely medial. In other words, one important letter typical of triunity, medially comprehended in one awful triverbal phraſe, compoſed of triliteral monoſyllables all beginning with the thrice-recurring initial of unity.

Here then, in this Jewiſh gayatri, we find the triliteral monoſyllabic-triverbal text, ſo much admired by the Hindoos, and combining all the literal triunities, initial, medial, and final, in every myſtical variety of number, poſition, form, obſcurity, &c. that the moſt enthuſiaſtic, in the pruriency of his imagination, can deſire. We might farther notice the awful letter ה, the initial and final, "the alpha and omega, the firſt and the laſt" of Jehovah, tremendous name! that, like the om of the Hindoo, no Hebrew would utter, as the final of the *firſt* and *laſt* words of the above "ineffable text," alſo the poſition, &c. of the phraſe "I am alpha and omega, the beginning and the end, the firſt and the laſt," in our ſcripture. It occurs *three* times, and in the *firſt* and *laſt* chapters of the revelation of St. John. But on theſe, and many other ſimilar, and probably, accidental points, that might be hence myſtically "milked out as it were," we have, perhaps, ſaid enough to ſhew why theſe triverbal, &c. phraſes, ſhould have been deemed ſo myſterious by enthuſiaſtic individuals, prone to regard every thing obſcure as myſterious, and every thing myſterious as profound.

It may be doubted if the received tranſlation of the important text in Exodus, iii. 14. be the beſt that could have been adopted. The Hebrew having no preſent tenſe, "I am," conjugatively, ſeems unauthorized by the original. Any literal tranſlation into Engliſh would perhaps be equally liable to objection. "I will be what I have been," to wit, a father, a protector, a God, unto them, has been paraphraſtically ſuggeſted. The concluſion of the verſe, however, appears to imply that אֶהְיֶה was not meant as any part of the conjugation of a verb. "Thus ſhalt thou ſay unto the children of Iſrael, I AM hath ſent me unto you." The important word in the Engliſh verſion occurs again in capitals. In this ſenſe of a ſacred cognomen many divines have received it. "The Eternal Almighty I AM hath ſent me," was an expreſſion of Whitefield, the enthuſiaſtic itinerant preacher, (Gillies' Life of Whitefield,) and ſhews that he, among others, received it in this light. Joſephus expreſsly ſays that it was not lawful to ſpeak of the name by which God revealed himſelf to Moſes. (See ADONAI). This was believed to have been Jehovah, for which the ancient Jews had a profound veneration; and ſoon after the Babyloniſh captivity it ceaſed to be uttered, its true pronunciation being ſuppoſed to be loſt or unknown. When the ſacred books were read in the ſynagogues, the reader, whenever this ſacred name occurred, did not attempt to pronounce it, but ſubſtituted for Jehovah the other word, which anſwers to the Engliſh word Lord. (See Horſeley's Sermons, vol. iii.) It was reſpectfully alluded to as the Name, the Ineffable Name, the Name of four letters: and in the Talmud curſes are denounced againſt thoſe who ſhould utter it. To try, even, was ſinful. (See JEHOVAH.) This we ſee is in uniſon with the Hindoo prejudices in regard to the unutterable OM, which they pre-eminently call the monoſyllable, the gayatri, the ineffable text, &c.

OM, in *Geography*, a river of Ruſſia, which is of a clear, but black looking water, that runs into the Irtiſch, at Omſk.

OM *el Miſk*, a ſmall iſland in the Red ſea, near the coaſt of Arabia. N. lat. 22° 35'.

OMA, one of the Molucca iſlands, about 9 miles long and 6 wide, containing 11 villages, the principal of which bears the ſame name, and about 5000 inhabitants.

OMACHIS, a river of Canada, which runs into lake St. Pierre. N. lat. 46° 16'. W. long. 72° 42'.

OMAGH, a poſt-town of the county of Tyrone, Ireland, where the aſſizes are held. It is ſituated on the river Cameron, and is nearly in the centre of the county. It was formerly the ſeat of an abbey. It is 86¾ miles N.N.W. from Dublin.

OMAGRA, a name given by ſome medical writers to the gout, when ſeated in the articulation of the humerus with the ſcapula.

OMAGUACA, in *Geography*, a town of South America, in the province of Tucuman; 50 miles N. of St. Salvador de Jugui.

OMAGUAS, a tribe of Indians, inhabiting the banks of the river Amazon, and converted to Chriſtianity in the year 1686, by father Fritz, a Spaniſh miſſionary. They flatten the hinder and fore part of the heads of their children, and thus give them a monſtrous appearance. They treat the people of other nations with ridicule, calling them calabaſh heads.

OMAGUAS, a town at the confluence of the Maranon and Tunguraga, otherwiſe called *St. Joachim*; which ſee.

OMAN, a town of Arabia, capital of a province of the ſame name; 60 miles N.W. of Maſcat. N. lat. 24°. E. long. 57° 20'.

OMAN, a province of Arabia, bounded on the E. by the ocean, on the N. by the Perſian gulf, and on the W. and S. by extenſive deſarts. It is poſſeſſed by a number of petty ſovereigns, the moſt conſiderable of whom is the Imam of Oman, or Maſkat. Several of theſe ſovereigns bear the title of ſcheich. The whole weſtern ſide of Oman is a ſandy plain, a day's journey in length, and extending from the village of Sib to the town of Sohar. The Imam's territories are mountainous to the brink of the ſhore. All the rivers continue to flow throughout the year, except that near which Sohar ſtands; which, traverſing an arid plain, loſes itſelf among the ſands, and reaches the ſea only in the rainy ſeaſon. The country affords plenty of cheeſe, barley, lentils, and different ſorts of grapes. Dates are ſo abundant, that ſeveral ſhip-loads of them are annually exported; and there is a variety of other fruits, and of pulp.

Here are alſo lead and copper mines. Fiſhes are ſo plentiful upon the coaſt, and ſo eaſily caught, as to be uſed not only for feeding cows, aſſes, and other domeſtic animals, but even as manure to the fields. The inhabitants are of different ſects in religion, and mutually regard one another as heretics. The ſubjects of the Imam follow one Muſſulman doctor, and thoſe of the Scheichs another. The territory poſſeſſed by the Imam of Oman is pretty extenſive, and contains ſeveral towns, ſuch as Roſtak, Kalbat, Kiloa, and Sinsjibar; but the moſt important and beſt known city in the dominions of this Imam is *Maſcat*, which ſee. To eke out his ſcanty revenue, the Imam does not himſelf diſdain to deal in trade. He keeps four ſhips of war, and a number of ſmall veſſels, which, in time of peace, he employs in the conveyance of goods, chiefly to and from the eaſtern coaſt of Africa, where he ſtill poſſeſſes Kiloa and Sinsjibar. Some other ſhips are kept to guard the coaſt, which is done ſo negligently or timidly, that pirates venture even into the road of Maſcat. The inhabitants of Oman, although not fond of ſea-fights, are nevertheleſs the beſt mariners in all Arabia. They have ſeveral good harbours, and employ many ſmall veſſels in the navigation between Jidda and Baſra. To the laſt town they ſend annually fifty veſſels, called "Trœnkis," which are ſewed together without nails, the planks being bound with cords. Two numerous tribes of Arabs are chiefly employed in carrying coffee by ſea. One of theſe tribes once inhabited the ſhores of the Perſian gulf; but being haraſſed by turbulent neighbours, they at length ſought refuge in the dominions of the Imam of Oman. Niebuhr.

OMAR I., in *Biography*, the ſecond of the caliphs or ſucceſſors of Mahomet, was diſtinguiſhed, while in a private ſtation, for his love of juſtice, and his zeal for the prophet's authority, of which the following inſtance has been given, though it ſurely deſerves a very different character: a Muſſulman, having a diſpute with a Jew, which was decided againſt him by the prophet, appealed from him to Omar, then in high authority, and held in great reſpect for his integrity and piety. Omar having heard the grounds of the diſpute, deſired the parties to wait a ſhort time, and withdrawing to his houſe, returned with a ſcymitar, and inſtantly clove down the Muſſulman with his weapon, exclaiming, "This is the reward of him who refuſes to ſubmit to the judgment of God and his prophet." It was on this account that Mahomet gave him the appellation of al-farouk, ſignifying both the divider and the diſtinguiſher, thus doubly alluding to his action, and the diſcernment that prompted it. On the death of Abubeker, in 634, he ſucceeded to the office of caliph, and he obtained at the ſame time the title of "Commander of the Faithful," which became that of the ſucceeding caliphs. One of the firſt acts of Omar was to ſuperſede the ferocious but ſucceſsful Caled in the command of the army in Syria; and he reſtored it to Abu Obeidah. (See CALED.) Omar, like his predeceſſor, was the friend to peace, and employed himſelf at home in the civil and religious functions of his office; but his reign was the era of ſome of the greateſt acceſſions made to the Arabian empire, by the conqueſts of its ſeveral chiefs. In Syria, after the capture of Damaſcus, the Moſlem army proceeded to the reduction of Balbec, or Heliopolis, and Emeſſa. The emperor Heraclius having ſent a great force to ſtop the progreſs of the Arabs, it was defeated by Caled in the year 636, at the bloody battle of Yermook. The ſiege of Jeruſalem was the immediate conſequence of this victory. It was bravely defended, but the beſieged having no proſpect of ſuccour, entered upon a treaty of capitulation. One of the articles agreed upon was, that in conſideration of the dignity of this holy city, the object of veneration to Mahometans, as well as to Chriſtians and Jews, the caliph ſhould come and take poſſeſſion of it in perſon. Omar agreed to the propoſal, and his journey has been thus deſcribed: mounted upon a ſorrel-coloured camel, in a tattered habit of hair-cloth, he carried with him his proviſion in two bags, conſiſting of ſodden grain and fruits, together with a leathern ſack filled with water, and a wooden diſh. When he halted to make a repaſt, he permitted any of his ſlender train to partake with him, eating from the ſame diſh. He performed with great devoutneſs all the offices of his religion, and during his march adminiſtered juſtice to all applicants. In ſeveral inſtances, he corrected the laxity of morals which was prevalent among the new converts, eſpecially in matrimonial caſes. On approaching Jeruſalem he was met by Abu Obeidah with an eſcort, and conducted with great reverence into the camp. He there publicly preached to the troops, and rigorouſly aboliſhed many luxurious indulgencies which had gained ground among them. He then ſigned the capitulation, by which the Chriſtian inhabitants of Jeruſalem were ſecured in their lives, properties, and the free exerciſe of their religious ceremonies, but at the ſame time were made tributary, and ſubjected to various humiliating reſtrictions. Omar then made his entry into the city, and viſited the places moſt remarkable for religious antiquities, in company with the patriarch, with whom he converſed moſt freely. Expreſſing a deſire to perform his devotions, the patriarch ſpread a mat for him in the church of St. Conſtantine, but the caliph declined taking advantage of this inſtance of civility, and, inſtead of worſhipping in the church, knelt down on one of the ſteps leading to the eaſt door, in order that he might ſecure to Chriſtians the uſe of their ſacred houſe, well knowing that if he, the caliph, had prayed in it, the Moſlems would ever after have claimed the ſame privilege. He made choice of the ſcite of Solomon's temple for the foundation of a Mahometan moſque, the only one erected by him in Jeruſalem. The converſion of a Jew by his arguments was a circumſtance which he ſaid gave him as much pleaſure as the conqueſt of the holy city. Having regulated the government of Syria, and directed Amru to undertake the reduction of Egypt, the caliph returned to Medina. Aleppo and Antioch were next reduced by the Moſlems, who made themſelves maſters of Paleſtine, and of ſeveral places near the Euphrates. Said, one of the commanders, croſſed the river Tigris, and ſacked the city of Madayn, the ancient Cteſiphon. Syria was at length completely ſubdued, and Amru, now principal commander, proceeded to Egypt, and completed the conqueſt of that country by the reduction of the great and rich commercial city of Alexandria. (See AMRU.) This event, ſays the hiſtorian, gave occaſion to one of the moſt remarkable incidents connected with the name of Omar. Upon an application from Amru to the caliph to know his pleaſure concerning the famous Alexandrian library, an anſwer was returned, commanding its deſtruction; "for," ſaid the caliph, "if the books agreed with the book of God (the Koran), they were ſuperfluous; if they diſagreed, they were pernicious, and ought to be deſtroyed." In conſequence of this horrible deciſion, the manuſcripts were delivered to the five thouſand public baths in the city, to which they ſerved as fuel during the ſpace of ſix months. (See ALEXANDRIAN *Library*.) Under the reign of Omar, Meſopotamia, part of Perſia, Khoraſan, and other remote oriental regions, were reduced to obedience to the Mahometan ſceptre. The days of this caliph were, however, cut ſhort by violence, for in the eleventh year of his reign he received a ſtroke from the dagger of a Perſian ſlave, exaſperated by a deciſion againſt him reſpecting his tribute, which, in the ſpace of three



days,

days, brought him to his tomb, at the age of ſixty-three. He refuſed to nominate a ſucceſſor, but appointed ſix electors to fill the vacant throne. Omar was deeply and deſervedly regretted by the people. His character is thus drawn by Gibbon: ſpeaking of the virtues of his predeceſſor, he ſays, "yet the abſtinence and humility of Omar were not inferior to the virtues of Abubeker; his food conſiſted of barley-bread or dates; his drink was water; he preached in a gown that was in rags: and a Perſian ſatrap, who paid his homage to the conqueror, found him aſleep among the beggars on the ſteps of the moſque of Medina. Economy is the ſource of liberality, and the increaſe of the revenue enabled Omar to eſtabliſh a juſt and perpetual reward for paſt and preſent ſervices to the faithful. Careleſs of his own emolument, he aſſigned to Abbas, the uncle of the prophet, the firſt and moſt ample allowance of twenty-five thouſand drachms or pieces of ſilver. Five thouſand were allotted to each of the aged warriors, the relics of the field of Beder, and the laſt and meaneſt of the companions of Mahomet was diſtinguiſhed by the annual reward of three thouſand pieces. One thouſand was the ſtipend of the veterans who had fought in the firſt battles againſt the Greeks and Perſians, and the decreaſing pay, as low as fifty pieces of ſilver, was adapted to the reſpective merit and ſeniority of the ſoldiers of Omar. Under his reign, and that of his predeceſſor, the conquerors of the Eaſt were the truſty ſervants of God and the people: the maſs of the public treaſure was conſecrated to the expences of peace and war; a prudent mixture of juſtice and bounty, maintained the diſcipline of the Saracens, and they united, by a rare felicity, the diſpatch and the execution of deſpotiſm, with the equal and frugal maxims of a republican government." Univer. Hiſt. Gibbon.

Omar II., the 13th caliph of the race of the Ommiades, ſucceeded his couſin, Solyman, in the year 717. He laid ſiege to Conſtantinople, but was forced to raiſe it, on account of a violent ſtorm, which deſtroyed a great part of his fleet. He was poiſoned at Emeſſa, in Syria, in the year 720. He is characteriſed as having been extremely juſt, religious, and devout, and as one who had fixed his mind, from his infancy, entirely upon another world. He had been extremely economical; but his liberality exhauſted all his revenues, and at his death he had nothing to leave to his ſucceſſors. Univer. Hiſt.

OMARA, in *Geography*, a river on the coaſt of Brazil, which runs into the Atlantic, and whoſe mouth is in S. lat. 5°, and W. long. 36°.

OMARK, a town of Norway; 38 miles N.E. of Frederickſtadt.

OMASUYOS, a juriſdiction of South America, in the government of Buenos Ayres, on the banks of the lake Titicaca. The climate is cold, ſo that it produces little grain, but its paſtures feed a great number of cattle, and it has four gold mines. It has alſo the advantage of a briſk trade, carried on in another juriſdiction by the Indians living on the borders of the lake, who are active and induſtrious in the proſecution of it.

OMBA, a ſmall iſland in the Adriatic, near the coaſt of European Turkey. N. lat. 43° 5′. E. long. 18° 9′.

OMBAY, an iſland in the Eaſt Indian ſea, about 60 miles in length from E. to W., and 18 in breadth. S. lat. 7° 58′. E. long. 125° 7′.

OMBERGAUM, a town of Hindooſtan; 25 miles W. of Poonah.

OMBLA, a river of Dalmatia, which runs into the Adriatic, a little N. of Raguſa, forming at its mouth a conſiderable gulf.

OMBO, a town of Egypt, on the E. coaſt of the Nile; 26 miles N. of Syene.

OMBRE, a celebrated game at cards; played by two, by three, or by five perſons; but generally by three.

The game of ombre is borrowed from the Spaniards, and requires all the phlegm and gravity of that people in the playing.

The name ſignifies as much as the *game of man; ombre*, or *hombre*, in Spaniſh, ſignifying *man*, in alluſion to the thought and attention required in it.

In ombre *by three*, nine cards are dealt to each party; the whole ombre pack being only 40, by reaſon the eights, nines, and tens are thrown aſide: he that wins muſt take five tricks, or four when the other five are divided, ſo as one have two and the other three.

After the cards are dealt, if none of the parties think their hand ſtrong enough to attempt for the ſtake or game, they all *paſs*; and after ſomething put down to the former ſtake, deal over again. If any will attempt for it, he henceforth is called the *ombre*; and the other two become leagued together, like two partners at whiſt, to defend it againſt him.

Note, each has the refuſal of being ombre, according to his order of ſeniority.

There are two ways of undertaking for the game: in the firſt, which is moſt uſual, after chooſing what he will have trumps, he diſcards, or lays aſide, what number of his cards he pleaſes, and in their lieu takes an equal number from the remainder of the pack: the like do the other two. The other way is, when he dare truſt to his own hand, and therefore declines to diſcard, or change any cards, but leaves that to the others, which is called playing *ſans prendre*: if he gains the point, in this latter caſe, he reaps ſomewhat extraordinary, more than in the firſt.

If he fail in either caſe, he is ſaid to be *beaſted*: and the failure is called a *remiſe*, or *repueſte*; and if one of the defenders of the ſtake win more tricks than he, ſuch perſon is ſaid to win *codille*, and takes up the ſtake the ombre played for: and in both caſes, the ombre is to forfeit the value of the ſtake played for to the board.

If the ombre win all the nine tricks, it is called winning the *vole*, and he reaps double; and if he attempt it, and miſcarry, he ſuffers proportionably.

The overſights and irregularities committed in the courſe of the game, are called *beaſts*, and ſubject the perſons chargeable therewith to forfeitures.

As to the order and value of the cards at ombre, it is to be obſerved, that the ace of ſpades, called *ſpadille*, is always the firſt or higheſt trump, in whatever ſuit the trump be: the deuce of trumps, when trumps are either of the black colours, or the ſeven, if of the red, is the ſecond trump, and called *manille*; the ace of clubs, called *baſto*, the third; and if either of the red ſuits be trump, the ace of that ſuit, called *punto*, the fourth. The reſt in the black ſuits are valued according to the following order; *viz.* king, queen, knave, ſeven, ſix, five, four, and three. In the red ſuits, they follow thus; king, queen, knave, deuce, three, four, five, and ſix.

The three firſt, or principal trumps, are called *matadores*; which have this privilege, that they are not obliged to attend an inferior trump when it leads; but for want of another ſmall trump, the perſon may renounce trumps, and play any other card. Add, that if the three matadores be in the hands of the ombre, in caſe he be beaſted, he is to forfeit for them; or if he gain his point, he is to have a conſideration for them; but for nothing leſs than three. And it muſt be farther noted, that the trumps immediately ſucceed-

ing theſe; *viz.* punto, king, queen, &c. if they be found in the ſame hand with the former, are alſo reputed as matadores, and to be allowed, or forfeited for, like the reſt; and this as low as the ſequence reaches, without interruption.

There are ſome varieties in the manner of playing the game of ombre. Sometimes he who has ſpadille is obliged to play, let his game be ever ſo bad; which is called *forced ſpadille*: ſometimes, when all have paſſed, a perſon undertakes the game on condition of diſcarding or making up his hand, before he names trump; which is called the *gaſcarille*.

In ombre *by five*, which ſome even prefer to that by *three*, as not requiring ſo much attention, only eight cards a-piece are dealt: and five tricks muſt be won, otherwiſe the ombre is beaſted.

Here the perſon who undertakes the game, after naming the trump, calls a king to his aſſiſtance; upon which, the perſon in whoſe hand the king is, without diſcovering himſelf, is to aſſiſt him as a partner, and to ſhare his ſate. If between both they can make five tricks, the ombre wins; and then the auxiliary king ſhares the ſpoil; and *vice verſâ*.

If the ombre *venture* the game without calling in any king, this too is called playing *ſans prendre*; in which caſe the other four are all againſt him, and he muſt win five tricks alone, or be *beaſted*. The reſt is much the ſame as by *three*, *mutatis mutandis*.

Ombre *de Soleil*, in *Heraldry*, *ſhadow of the ſun*, is when the ſun is borne in armoury, ſo as that the eyes, noſe, and mouth, which at other times are repreſented, do not appear; and the colouring is thin, ſo that the field may be ſeen through it.

OMBRIA. See Brontia and Ceraunia.

OMBROMETOR, a machine to meaſure the quantity of rain that falls. We have the deſcription and figure of one in Phil. Tranſ. N° 473. p. 12. It conſiſts of a tin funnel, whoſe ſurface is an inch ſquare, a flat board, and a glaſs tube ſet into the middle of it in a groove. The riſe of the water in the tube, whoſe capacity, at different times, muſt be meaſured, and marked, ſhews the quantity of rain that has fallen. See Rain-*gage*.

OMBRONE, in *Geography*, a river of Etruria, which runs into the Mediterranean, 5 miles S. of Groſſetto. N. lat. 43° 47′.—Alſo, a town of Etruria, in the territory of Sienna, at the mouth of the Ombrone.—Alſo, a river of Etruria, which runs into the Arno, 8 miles below Florence.

OMDARRA, a town of Bengal; 27 miles E.S.E. of Nagore.

OMDINAR, a town of Egypt, at the ſeparation of the two great branches of the Nile; 7 miles N.N.W of Cairo. N. lat. 30° 6′. E. long. 49° 3′.

OMEDUNDA, a town of Bengal; 34 miles N.N.E. of Doeſa.

OMEGNA, a town of Italy, in the department of the Gogna; 25 miles N.N.W. of Navarre.

OMELET, or Amlet, a kind of pancake, or fricaſſee of eggs, with other ingredients, very uſual in Spain and France.

Menage derives the word from the Italian *animella*, *little ſoul*; which, he ſays, the people uſe for the nice bits among the giblets of fowls, &c. uſed for fricaſſees, as livers, hearts, kidnies, gizzards, &c. From whence, by reſemblance, is formed the French *amelette*, *a fricaſſee of eggs*. Tripod derives the word from αμα, *together*, and λυειν, *to diſſolve*, *moiſten*, *mix*. And M. de la Mothe le Vayer, from the French *œuf*, *egg*, and *melez*, *mingled*.

The forms of omelets are various. We meet with farced omelets, omelets with ſugar, omelets of green peas, omelets *à la Turq*, &c.

A noted author in this way preſcribes the following one: the eggs being beaten, are to be ſeaſoned with ſalt and pepper, and then fried in butter made boiling hot: this done, gravy is to be poured on, and the whole ſtrewed with chives and parſley, ſhred ſmall. When one ſide is fried enough, it is to be turned on the other.

OMELLOOR, in *Geography*, a town of Hindooſtan, in Travancore; 6 miles N. of Anjenga.

OMELOVAIA, a town of Ruſſia, in the government of Ekaterinoſlav, on the Dnieper; 60 miles N.E. of Cherſon.

OMELYSIS, a word uſed by Hippocrates, and others of the ancients, to expreſs the meal of barley, crude or not parched. It is recommended, when reduced to the form of a poultice, by boiling in wine and oil, for curing all tumours of the tonſils. It is alſo recommended, mixed in water, to be drank in hæmorrhages of the uterus. Authors of later date have made the word omelyſis ſtand for all ſorts of meal or flour, and ſome for an equal mixture of the meal of barley, linſeed, and ſenugreek ſeed, in equal quantities; in medicine uſed for horſes. And Cœlius Aurelianus uſes it frequently for a cataplaſm made either of meal, or bread, and water.

OMEN. The primitive and literal ſignification of this word ſeems to be, a ſign of future events from the language of a perſon ſpeaking, without any intention to propheſy: this meaning of the word is implied in the well-known paſſage of Cicero: "Pythagorei, non ſolum voces deorum obſervarunt, ſed etiam hominum quæ vocant *omina*."

The application and meaning of this term was, however, ſoon extended; and in its ſecondary ſenſe comprehended and ſuppoſed ſigns of future events, or preſages, drawn from things, as well as from the words of men. The third ſenſe, in which it is uſed by ancient writers, is ſtill more comprehenſive as well as common: in this ſenſe, it includes the whole myſtery and practice of augury, as it was purſued on a regular ſyſtem by the Greeks and Romans.

The word omen, in all theſe three ſenſes, is applied to ſigns of future events, drawn from circumſtances neither ſupernatural, nor very extraordinary or uncommon. The ſame principle of the human mind, however, which has led rude or ſuperſtitious and unenlightened men to infer future events from natural and common circumſtances, operated with much more effect, in creating the belief, that ſupernatural and extraordinary events were the preſages of what was to happen. Hence the word omen, in its moſt extended ſenſe, ſignified any portent or prodigy.

The law and proceſs of the human mind, by which the belief of omens is generated, is explained in a moſt clear, ſatisfactory, and philoſophical manner, in the following paſſage of profeſſor Stewart, in his Elements of the Philoſophy of the Human Mind, p. 346, quarto edition.

"This tendency of the mind to aſſociate together events, which have been preſented to it nearly at the ſame time; although, on the whole, it is attended with infinite advantages, yet, like many other principles of our nature, may occaſionally be a ſource of inconvenience, unleſs we avail ourſelves of our reaſon and of our experience in keeping it under proper regulations. Among the various phenomena which are continually paſſing before us, there is a great proportion, whoſe vicinity in time does not indicate a conſtancy of conjunction; and unleſs we be careful to make the diſtinction between theſe two claſſes of connections, the order of our ideas will be apt to correſpond with the one as well as with the other; and our unen-

lightened

lightened experience of the paſt will fill the mind with vain expectations, or with groundleſs alarms, concerning the future. This diſpoſition to confound together accidental and permanent connections, is one great ſource of popular ſuperſtitions. Hence the regard which is paid to unlucky days; to unlucky colours; and to the influence of the planets: apprehenſions which render human life, to many, a continued ſeries of abſurd terrors. Lucretius compares them to thoſe which children feel, from an idea of the exiſtence of ſpirits in the dark.

"Ac veluti pueri trepidant, atque omnia cæcis
In tenebris metuunt, ſic nos, in luce timemus
Interdum nihilo, quæ ſunt metuenda magis."

Such ſpectres can be diſpelled by the light of philoſophy only; which, by accuſtoming us to trace eſtabliſhed connections, teaches us to deſpiſe thoſe which are caſual; and by giving a proper direction to that bias of the mind which is the foundation of ſuperſtition, prevents it from leading us aſtray."

The belief in omens was particularly ſtrong and general among the Greeks and Romans; and there is good reaſon to believe that even the moſt celebrated philoſophers among the former were nearly as much addicted to it as the moſt ignorant and ſuperſtitious of the vulgar. If we lay aſide that extreme fondneſs for diſcovering ſublime, enlightened, and myſtical meanings in the doctrines of Pythagoras, and give proper weight, in eſtimating the character of that philoſopher, to the ignorance and credulity of the times in which he lived, and which muſt have operated, in ſome degree, upon his mind and opinions, perhaps we ſhall be diſpoſed to regard many of the ſymbols (as they are called) which are aſcribed to him, not as embracing and concealing his peculiar doctrines, but as inculcating an ominous obſervance of the things to which they relate. Certainly ſeveral of the following ſymbols wear greatly this appearance. Adore the ſound of a whiſpering wind. Stir not the fire with a ſword. Turn aſide from an edged tool. Paſs not over a balance. Setting out on a journey, turn not back, for the furies will return with you. Breed nothing that has crooked talons. Receive not a ſwallow into your houſe. Look not in a mirror by the light of a candle. At a ſacrifice pare not your nails. Eat not the heart or brain. Taſte not that which hath fallen from the table. Break not bread. Sleep not at noon. When it thunders, touch the earth. Pluck not a crown. Roaſt not that which has been boiled. Sail not on the ground. Plant not a palm. Breed a cock, but do not ſacrifice it, for it is ſacred to the ſun and moon. Plant mallows in thy garden, but eat them not. Abſtain from beans.

Among the Greeks there were many omens connected with their ſacrifices: if the beaſt, intended for this purpoſe, eſcaped the ſtroke, leaped up after it was given, did not fall flat on the ground, or kicked and ſtamped after its fall; or if it did not bleed freely, or appeared to expire with pain or difficulty; theſe were conſidered as unlucky omens. It was alſo deemed unlucky, if the victim went unwillingly to the altar; and every method, likely to anſwer the purpoſe, was followed, in order that it might be induced to nod its head, which was regarded as a token of aſſent: when this could be effected by no other means, it was cuſtomary to pour water into its ear. The wagging of its tail, interpreted as another mark of aſſent, was always regarded as a lucky omen.

Omens were drawn from every part of the victim, but eſpecially from the liver; next to the liver, the heart was moſt obſerved: if this were ſmall, or wrinkled, or if it palpitated much, it was unlucky; and if the victim proved to be deſtitute of a heart, it was a moſt deadly omen. After the heart, omens were drawn from the gall, the lungs, the ſpleen, and the membranes, in which the bowels were encloſed.

But omens were drawn, not only from the victims themſelves, but alſo from the things that were made uſe of at ſacrifices: if the flames immediately caught and conſumed the victim, it was a good ſign; and in order to ſecure this, dry ſticks were always prepared. The nature of the flame was alſo regarded: if it was bright and pure, without noiſe or ſmoke, and if it did not go out till the victim was entirely conſumed, the omen was propitious.

But the principal and moſt numerous omens of the Greeks were drawn from birds; and this ſpecies of divination arrived at ſuch perfection, and gained ſo much credit, that other kinds were paſſed by or little regarded, if not confirmed by it.

When the Grecian augurs, who were employed for the purpoſe of taking theſe omens, made their obſervations, they kept their faces towards the north; the eaſt being conſequently on their right-hand, and the weſt on their left. The omens which appeared towards the eaſt were looked upon as fortunate by all the nations of antiquity, becauſe the ſun, the great fountain of light and heat, and the principal cauſe of fertility and animal comfort, makes his firſt appearance in that quarter: on the contrary, the weſtern omens were conſidered unlucky, becauſe the ſun leaves the world in that quarter.

But though both the Greeks and Romans regarded thoſe omens which were ſeen in the eaſt as lucky, and thoſe which appeared in the weſt as unfortunate, yet as the augurs among the former made their obſervations with their faces towards the north, while the Roman augurs made their obſervations with their faces towards the ſouth; the ſigns that were preſented on the right-hand were regarded by the Greeks as fortunate, and thoſe on the left as unlucky: but among the Romans the reverſe was the caſe. Sometimes, however, the Latin authors followed the Greek cuſtom in their uſe of the word *ſiniſtra*, and apply it to unlucky events.

Birds were conſidered as fortunate, or unfortunate, either from their own nature, or according to the place and manner of their appearance: hence the ſame birds, at different times, were ſuppoſed to foretell different and contrary events.

If a flock of birds of different kinds came flying about any man it was an excellent omen. The eagle was particularly obſerved for the purpoſe of drawing omens: when it was obſerved to be briſk and lively, and eſpecially if, during its ſportiveneſs, it flew from the right-hand to the left, it was one of the beſt omens which the gods could give. Reſpecting vultures there are different opinions, both among the Greek and Roman authors: by ſome they are repreſented as birds of lucky omen, while Ariſtotle and Pliny reckon them among the unlucky birds. If the hawk was ſeen ſeizing and devouring her prey, it portended death; but if the prey eſcaped, deliverance from danger was portended. Swallows, wherever, and under whatever circumſtances they were ſeen, were unlucky birds: before the defeat of Pyrrhus and Antony they appeared on the tent of the former, and the ſhip of the latter, and by diſpiriting the minds, probably prepared the way for their ſubſequent diſaſter.

In every part of Greece, except Athens, owls were regarded as unlucky birds: but at Athens, being ſacred to Minerva, they were looked upon as omens of victory and

ſucceſs. The ſwan, being an omen of fair weather, was deemed a lucky bird by mariners.

The moſt inauſpicious omens were given by ravens; but the degree of misfortune which they were ſuppoſed to portend, depended, in ſome meaſure, on their appearing on the right-hand, or the left: if they came croaking on the right-hand, it was a tolerable good omen; but if on the left, a very bad one.

As the cock, when he is overcome, ſits ſilent and melancholy, but when he obtains a victory, ſtruts about and crows; his appearance in the former ſtate was looked upon as the preſage of defeat; in the latter ſtate, as predicting victory.

Omens were alſo drawn by the Greeks from other animals beſides birds: bees, it is well known, were eſteemed an omen of future eloquence; but when a ſwarm of them lighted upon an altar, it was a very dreadful omen: this circumſtance happened, according to Appian, before the defeat of Pompey. It is rather ſingular that toads, which are now regarded, even by people of ſtrong and well informed minds, with a conſiderable degree of dread and apprehenſion, were accounted by the Greeks lucky omens; while the hare was conſidered as preſaging diſaſter.

Thunder and lightning were deemed fortunate or otherwiſe, according as they occurred on the right-hand or on the left: when an unlucky omen was given by thunder, it was ſuppoſed to be averted by pouring forth a libation of wine; and in order to deſtroy or avert the malignant influence, when it was ſeen on the left-hand, it was uſual to hiſs and whiſtle at it.

Omens were alſo drawn by the Greeks from things which affected their own perſons; from things external, "that only appeared to men, but did not make any impreſſion on them;" and from ominous words. The moſt remarkable of theſe we ſhall notice.

The palpitations of the heart, the eye, or any of the muſcles, and the ringing of the ears, were ominous: the omen was lucky, if the palpitations were on the right ſide of the body, or the ringing in the right ear. A number of rules were laid down for the purpoſe of aſcertaining whether ſneezing were fortunate, or the contrary. "When Themiſtocles was offering ſacrifices, it happened that three beautiful captives were brought to him, and at the ſame time the fire burned clear and bright, and a ſneeze happened on the right-hand: hereupon, Euphrantides the ſoothſayer embracing him, predicted the memorable victory that he afterwards obtained." Xenophon was appointed general, in conſequence of a ſneeze happening on the right-hand while he was making a ſpeech. If a perſon ſneezed between midnight and the following noon it was fortunate, but from noon to midnight, unfortunate. "If a man ſneezed at table while they were taking it away, or if another happened to ſneeze upon his left-hand, it was unlucky; if on the right-hand, fortunate. If, in the undertaking any buſineſs, two or four ſneezes happened, it was a lucky omen, and gave encouragement to proceed: if more than four, the omen was neither good nor bad: if one or three, it was unlucky, and diſſuaded them from proceeding in what they had deſigned: if two men were deliberating about any buſineſs, and both of them chanced to ſneeze together, it was a proſperous omen." Potter's Antiquities, vol. i. p. 339.

A very numerous and important claſs of omens were thoſe which were drawn from things which preſented themſelves in the way, called by the Greeks Ενοδια συμβολα; the meeting of an eunuch, a black, an ape, a bitch with whelps, a vixen with cubs; a ſnake lying in the road, ſo as to oblige the company to divide; or a hare croſſing the path, were deemed bad omens. Some things were regarded as portending evil conſequences to the huſbandman: if, while he was going to ſow his land, he ſaw a woman at work with her ſpindle, or carrying it uncovered, he anticipated a bad harveſt. If, on the meeting of a public aſſembly, a weazel was obſerved to croſs the path, no buſineſs was done: a moſt curious reaſon is given by Artemidorus for regarding this omen on this occaſion; becauſe γαλη, the Greek word for a weazel, is ισοψηφος to δικη (a public aſſembly, or judgment), *i. e.* the letters in each word ſignify the ſame number, *viz.* 42.

When the Greeks went to ſupplicate the gods to obtain any favour, or to avert any calamity, it was uſual to touch the knees of the ſtatue; if they had hopes, they touched the right-hand; if they were confident of obtaining the object of their prayers, they roſe as high as the chin or cheeks, but in no caſe did they ever touch the left-hand of the ſtatue, as that was deemed unlucky.

Before they ſet out on any military expedition, it was uſual to let fly a dove, which was conſidered as an omen of ſafe return, as that bird is not eaſily induced to relinquiſh its habitation, but when driven away conſtantly returns.

The uttering many words was conſidered as ominous; therefore the Greeks never made uſe of the terms which directly expreſſed *death*, but conveyed their meaning on this ſubject by indirect and ſoftening terms; of which is very remarkable, and expreſſive, απογινεσθαι, to which the Latin word *denaſci* anſwers, uſed on the ſame account: inſtead of the word ſignifying a priſon, they uſed one ſignifying a houſe; and they were even careful not to call their deities by their appropriate appellations, if theſe appellations were words of bad omen; they therefore generally addreſſed the furies, Ερινυες, by the names Σεμναι θεαι, or Ευμενιδες.

It was cuſtomary for them to clothe their dead in white garments, whence it was reckoned an unlucky omen, and foretelling death, for a ſick perſon to have white apparel; and if a perſon dreamt of a fire being extinguiſhed during the ſickneſs of any in the ſame family, it was deemed a certain forerunner of death.

Perſons in affliction ſuffered their hair to grow long: to cut or ſhave the hair was a token of joy: mariners, upon their delivery from ſhipwreck, uſed to ſhave themſelves; hence, if they dreamt of having the whole head ſhaved, it was an omen that they would undergo great dangers at ſea, but eſcape from them. The younger Pliny, in one of his epiſtles, mentions that he dreamt he had cut off his hair: and this dream he interprets to ſignify his deliverance from ſome great and imminent danger. Men, however, who were labouring under misfortune, though they did not permit others to ſhave them, ſometimes ſhaved themſelves; hence for a man to dream of ſhaving himſelf was a preſage of ſome great calamity.

It was uſual among the Greeks to bedeck the tombs with flowers, herbs, and ribbands: parſley was eſpecially uſed for this purpoſe; hence it was regarded as a bad omen. As Timoleon was proceeding to reconnoitre the poſition and ſtrength of the Carthaginian army, he was met by a number of mules loaded with parſley; this his ſoldiers conceived to be an unlucky omen; but Timoleon with much ingenuity and preſence of mind converted it, in the opinion of his troops, into an omen of victory, by recalling to their recollection, that, at the Iſthmian games, the Corinthians crowned the victors with chaplets of parſley, accounting it a ſacred wreath: in order to impreſs this interpretation of the omen more ſtrongly on them, he firſt made himſelf a chaplet, and then his captains and all the ſoldiers followed his example. With like addreſs, Epaminondas

nondas converted the bad omen which his ſoldiers drew, from the circumſtance of a ribband that hung on his ſpear being carried by the wind to a Lacedæmonian ſepulchre, into a preſage of the defeat of the enemy, by aſſuring them, that as the ribband had been carried to the ſepulchre of the Lacedæmonians, it muſt portend death to them, and not to the Thebans.

The Greeks were particularly careful not to marry, except at propitious ſeaſons. January was eſteemed the moſt fortunate month; and the marriage was expected to be moſt fortunate, if it were celebrated at the time of full moon. Other things were alſo regarded as ominous reſpecting their marriages; if a pair of turtles appeared during the celebration, it was deemed lucky, and a preſage of domeſtic concord. The crow appearing denoted long life to the married pair, if it appeared with its mate; but if it was ſeen ſingle, ſeparation and ſorrow were portended, whence it was cuſtomary at nuptials for the maids to watch, that none of theſe birds, coming ſingle, ſhould diſturb the ſolemnity. If pregnant women were delivered without pain, and eſpecially if they brought forth twins, it was regarded as a good omen, a convincing proof of chaſtity, and a peculiar mark of divine favour. Soon after the children were born, they were placed in winnowing vans, which were looked upon as omens of their future proſperity and riches.

There were ſeveral modes of averting bad omens; Pliny expreſsly declares, that the force and efficacy of the omen depended upon the perſons to whom they appeared. If the omen was taken by the hearer, or ſtruck upon his imagination, it was efficacious; but if neglected, or not taken notice of, it was of no force. Julius Cæſar never was deterred by them from any undertaking: Auguſtus, on the contrary, was remarkably ſuperſtitious, and frequently deſiſted from his deſigns on their account. The moſt effectual mode to avert an omen was either to throw a ſtone at a thing, or to kill it outright, if it was an ominous animal; by this means, the evil which it portended was ſuppoſed to fall upon its own head: if it was an unlucky ſpeech, it was cuſtomary to retort it upon the ſpeaker. At the ſight of a madman, or one troubled with epilepſy, it was cuſtomary to ſpit three times into their boſoms, to expreſs that they held the omen in contempt and averſion. Frequently, however, when the Greeks met an unlucky omen, they deſiſted from what they were doing, and began it anew. Euripides deſcribes a perſon, on hearing an ominous word, throwing the cup out of which he was about to drink upon the ground, and calling for another.

As the omens of the Romans were nearly ſimilar to thoſe of the Greeks, we ſhall only notice ſuch as were peculiar to them. Chickens were regarded as affording ſuch important omens, that a perſon, called *Pullarius*, was expreſsly employed to keep them: omens drawn from them were had recourſe to before commencing an engagement. If the chickens came too ſlowly out of the cage, or would not feed, it was a bad omen; but if they fed greedily, ſo that ſome part of their food fell and ſtruck the ground, it was deemed an excellent omen. In the very early times of the republic, before an army paſſed a river, a kind of auſpices were taken from examining the beaks of birds; but Cicero ſays, this had fallen entirely into diſuſe in his time.

When Cæſar landed at Adrumetum, in Africa, with his army, he happened to fall on his face; this was regarded as a bad omen; but he, not being accuſtomed to pay attention to preſages, and therefore, poſſeſſing great preſence of mind on the occaſion, turned it to the contrary; for taking hold of the ground with his right hand, and kiſſing it, as if he had fallen on purpoſe, he exclaimed, "I take poſſeſſion of thee, O Africa."

Auguſtus, on the contrary, as has been already obſerved, was remarkably ſuperſtitious. When the Greeks and Romans put on their clothes, the right ſide was ſerved firſt; and, therefore, if a ſervant gave his maſter his left ſhoe firſt, it was regarded as a bad omen. This omen Auguſtus regarded with a peculiarly ſtrong ſuperſtitious dread; and this was much increaſed when one day, his left ſhoe having been put on before his right, he was nearly deſtroyed by a mutiny among ſome of his ſoldiers. He alſo paid particular attention to lucky and unlucky days; he never went abroad upon the day following the *nundinæ*, nor began any ſerious undertaking on the *nones*. It was, indeed, a general opinion among the Romans, that the days immediately following the *nones*, ides, and kalends, were unfortunate. The emperor Valentinian conſidered the 24th of February, in the biſſextile year, as ſo very unfortunate, that having been choſen emperor on that day, he was afraid to ſhew himſelf in public, leſt ſome evil ſhould befall him. (Ammian. Marcell. lib. xxvi. cap. 1.) The emperor Charles V., on the contrary, regarded that as one of the moſt lucky days. (Bayle, Penſées diverſes, p. 47.) The day on which the Romans ſuffered their memorable defeat from the Cimbrians, was long viewed as a moſt unfortunate day; and no general, if he could poſſibly avoid it, would begin a battle on it. When Lucullus expreſſed his determination to attack Tigranes, king of Armenia, on that day, his officers unanimouſly and ſtrongly oppoſed him; but he perſiſted in his deſign, gave battle, completely routed the enemy, obtained one of the moſt ſignal and important victories recorded in Roman hiſtory, and changed the character of the day from unfortunate to fortunate, as he foretold he would, when his officers endeavoured to diſſuade him from fighting.

The Romans paid particular regard to lucky and unlucky names; at public luſtrations, the perſons who brought the victories, were required to have *bona nomina*, fortunate names; and regard was had to the ſame circumſtance in raiſing their levies: eſpecial care was taken that the firſt man who enrolled himſelf ſhould have a name of good augury; and the cenſors, in taking the cenſus of the citizens, always began with a fortunate name, ſuch as Valerius, Salvus, &c.; and in the adjudication of public property, they began with ſome that had a fortunate appellation, *boni ominis ergò*. Feſtus relates, that the ſcrupulous regard to names of good and bad omens, was ſo minute and exceſſive among the Romans, that the women, during their pregnancy, offered ſacrifices to the goddeſs Egeria, becauſe the name Egeria had a cloſe relation to child-delivery, "quod eam putarent facile fœtum alvo *egerere*."

When Julia, the wife of the emperor Severus, had rendered herſelf infamous by her debauched and profligate courſe of life, her huſband conſoled himſelf for his misfortune, by his belief that her name was one of bad omen; all who had borne this name, in his opinion, having been remarkable for looſe and lewd manners.

The oriental nations carry their belief in, and regard to, omens to as great a length as the Greeks and Romans did. The Perſians have diſtinct and appropriate names for the different kinds of omens: *teryk* ſignifies that kind, by which, by throwing pebble-ſtones or gravel, future events are preſaged: *eyaſ*, divination from birds, the flight of which is obſerved as carefully as it was among the Greeks or Romans: *kari* is the name of a bird with a long beak, which the Perſians and Arabians conſider as a bird of good omen, and which they are always glad to meet. If a deer is ſeen

deſcending

deſcending from a mountain, or behind the beholder, it is regarded as an unlucky omen, and to omens of this character the name *kades* is given.

The oriental nations alſo are very attentive to fortunate and unfortunate days; about the middle of February, they celebrate a feaſt in honour of the angel *Iſfendarmuz*, the guardian of the fair ſex; and marriages contracted during this ſolemnity were regarded as peculiarly fortunate. If an Aſiatic, when he is ſetting out on important buſineſs, meets with a perſon whom he ſuppoſes to have an unlucky foot, (*ſhum kudem*,) he immediately returns; and if an involuntary cough or ſneeze interrupt the Mahometans during their ablutions, the whole ſervice is began anew, and that as often as it happens. Before a married man ſets out on a long journey, he twiſts, in a particular manner, two branches of the broom called *retem;* and if, on his return, he finds them ſtill twiſted, it is an omen of the fidelity of his wife; but if they are untwiſted, he regards it as ſuch an unfortunate omen, that nothing will induce him to believe her innocent. By a ſingular mode of augury, they endeavour to foretell the weather; they tie ſome combuſtible matter to the tail of a bullock, to which they ſet fire; if the animal runs up the hill, they conſider it as a ſure prognoſtic of rain. When a Perſian peaſant wiſhes the wind to riſe for the purpoſe of winnowing his corn, inſtead of whiſtling, as is common in different parts of Europe, he rubs and ſcatters into the air a ſpecies of ſaffron, and by this means anticipates what he deſires.

In the eaſt there are certain inſects, the name and ſpecies of which are not well known, which are accuſtomed to utter a mournful and ſolemn hum during the night; whenever they are heard great evil is preſaged.

Tamerlane was very attentive to lucky and unlucky days; and he ſeldom put his army in motion, and never engaged in battle, till the aſtrologers had fixed the fortunate hour: an idiot having once thrown a breaſt of mutton at him, while he was planning the conqueſt of *Kharezme*, ſometimes called the *breaſt of the world*, he interpreted it before all his army as an infallible omen of his ſucceſs.

The ancient Germans made much uſe of the horſe in their omens; theſe animals, eſpecially ſuch as were white, were kept at the public expence, and not allowed to be worked for the uſe of man; the preſages were drawn from the mode and time of their neighings. When they were about to engage in any military enterpriſe, they ſet up three rows of ſpears, each row conſiſting of a certain number fixed in the ground, and one laid acroſs the top: when they were thus fixed, a horſe was brought out by the prieſt, and led to the ſpears; if he advanced in ſuch a manner, that his right foot reached the ſpears firſt, the omen was fortunate; but if his left foot advanced before his right, the omen was unlucky: this ceremony was repeated before each of the rows of ſpears; it was alſo obſerved before they embarked on any naval expedition. When the northern nations were converted to Chriſtianity, and indeed for a conſiderable time afterwards, they were ſo devoted to this and ſimilar ſuperſtitions, that a decree of one of the councils expreſsly treats *de auguriis vel avium, vel equorum, vel boum ſtercore, vel ſternutatione.*

Women were appointed by the ancient Germans, as well as men, to obſerve the omens; and one of the moſt ſingular to which they paid eſpecial attention, was derived from obſerving the motions and eddies of a ſtream of water.

Formerly, in Iceland, if a lambent flame was obſerved on the ſurface of the ground, a circumſtance by no means uncommon in that country, it was regarded as a good omen; hidden treaſure was believed to lie in the ground where the flame was ſeen.

A moſt barbarous and inhuman mode of preſaging future events was practiſed among the Scandinavians; they ſacrificed human victims for the expreſs and ſole purpoſe of knowing what was to happen, by the inſpection of their entrails, by the effuſion of their blood, and by the greater or leſs degree of celerity with which they ſunk to the bottom of the water; when the laſt mode was followed, the victim was thrown into a deep well in the neighbourhood of the temple, in honour of *Goya*, or the earth; if he went at once to the bottom, the omen was good; but the reverſe, if he ſwam a long time on the ſurface. If, when the victim was burnt, the ſmoke aſcended very high, it was regarded as a moſt fortunate omen.

The number three, and its combinations, was regarded as uncommonly fortunate by the Scandinavians, as it was, indeed, by other ancient nations, and as it ſtill is amongſt us. Every ninth month they renewed their moſt ſolemn ſacrifices, which were to laſt nine days, and on every day nine living victims, men or animals, were to be offered up. When Olug Nuvin, the youngeſt of Jenghiz Khan's ſons, as maſter of the houſhold, preſented his eldeſt brother with a cup of wine, all the people, hailing him emperor, made nine genuflexions to him, as their ſovereign, and three to the ſun; the number nine was, indeed, in great veneration among the Tartars; when they made preſents to their princes, the number of them was always nine: this number, and its combinations, was always attended to at their feaſts, in their diſhes and ſkins of wine; and even the roving Tartars robbed the caravans by this rule, and would rather take nine of any thing than a greater number. The old Iriſh, in the elections of their *taniſts*, uſed to deliver a wand to him whom they meant to raiſe to that dignity, he having previouſly aſcended a high ſtone; and as ſoon as he had received the wand, he deſcended and turned himſelf round, thrice forward and thrice backward.

But to return to the Scandinavians; they as well as all the other northern nations paid great attention to particular days, and eſpecially to the age of the moon; if poſſible, they avoided engaging in battle before the new moon; and the moon, when new or full, was regarded as the moſt auſpicious for all enterpriſes. The Anglo-Saxons had their lucky and unlucky days for bleeding. Theodore, the monk, taught them that it was dangerous to bleed when the light of the moon and the tides were increaſing; and he pointed out the particular hours of the day when it might be done with ſafety and advantage. The reaſon, if reaſon it can be called, of conſidering the increaſing moon as propitious in ſome caſes, and the waning moon as propitious in others, will be ſtated, when we come to treat of the omens of the Highlanders.

Indeed, among the Anglo-Saxons, as among the Greeks and Romans, every day in every month was propitious or unpropitious for ſome action or another; and thunder, lightning, the new moon, and new year, were lucky or not, according to the day on which they happened. Among the Druids, the ſixth day of the moon was conſidered as a moſt propitious day for embarking on any undertaking, or beginning a journey.

As the manners and cuſtoms of the ancient Britons were derived from thoſe of the Scandinavians, or Celts, their ſuperſtitious ideas, with reſpect to omens, were ſo nearly the ſame, that they need not be detailed. It may, however, be remarked, that the hare was much employed by the ancient Britons

Britons for the purpoſes of augury, and it was therefore interdicted at table.

In the firſt ages of Chriſtianity, the belief in omens was very prevalent and ſtrong. Ambroſe, Noy biſhop of Noyon, Chryſoſtom in his Homilies, Baſil, Auguſtin, and others, inveigh bitterly againſt it; from their account, the omens, in which the firſt Chriſtians put faith, were very ſimilar to thoſe which prevailed among the Greeks and Romans; ſneezing under certain circumſtances; meeting on the road a cat, a dog, a woman of bad character, a perſon with one eye, or a lame perſon; ſtumbling againſt any thing, or when one was going out of the houſe, being held back by the cloak catching any thing; the palpitation of an eye or muſcle; and innumerable other omens, are mentioned and reprobated by theſe fathers.

Perhaps no change that has taken place within theſe laſt fifty years, is greater or more ſtriking, than that which has gradually been effected in the ſuperſtitious belief of the common people in this kingdom, and probably, though not to ſuch a great degree, in the other kingdoms of Europe. In the middle of the laſt century, the belief in fairies, witches, omens, and ſuperſtitious powers and practices, prevailed, almoſt univerſally, among the lower orders of the community, and even had faſt hold on many of a ſuperior rank and condition of life, eſpecially in the country. Now this belief is ſcarcely found, except among very old people, and in very remote places; and where it does exiſt, it is regarded by the generality of the lower claſs in its proper light. The following enumeration of lucky and unlucky omens, therefore, has reference, rather to popular belief, about the beginning or middle of the laſt century, than to the preſent time; except, as has been already ſtated, in remote places, and among old people.

It appears to have been the popular belief in this country, (though probably prior even to the period we have mentioned) that one of the moſt unlucky omens that could poſſibly happen, was the ſneezing, or the dreams of an old woman; this, no doubt, aroſe from old women being commonly regarded as witches; and it was a common ſaying, that an old woman could believe what ſhe choſe.

In the days when the belief in omens flouriſhed in England, the following were deemed lucky: if, on ſetting out on a journey, a ſow with pigs were met, the journey would be ſucceſsful; to meet two magpies portended marriage; three, a ſucceſsful journey; four, unexpected good news; and five, that the perſon would ſoon be in the company of the great. If, in dreſſing, a perſon put his ſtockings on wrong ſide out, it was a ſign of good luck; but the luck would be changed, if the ſtockings were turned the right way. Nothing could enſure ſucceſs to a perſon going on important buſineſs, more effectually than throwing an old ſhoe after him, when he left the houſe. If a younger ſiſter were married before the elder ones, the latter ſhould dance at her wedding without ſhoes, otherwiſe they will never get huſbands. To find a horſe-ſhoe is deemed lucky, and it is ſtill more ſo, if it be preſerved and nailed upon the door, as thus it prevents witchcraft.

In England, and more particularly in Wales, according to Pennant, it is a good omen, if the ſun ſhines on a married couple, or if it rains when a corpſe is burying. According to the old diſtich,

> "Happy is the bride that the ſun ſhines on,
> Happy is the corpſe that the rain rains on."

There were alſo lucky and unlucky days: according to ſir Thomas Browne, in his Vulgar Errors, there were certain days, when alone, the common people would pare their nails, or have their hair cut; and he adds, that the Romans carefully abſtained from doing theſe things on the *Nundinæ*.

Even yet, Valentine's day is regarded as ominous, in reſpect to marriage, by more than the lower claſſes: and if it rain on St. Swithin's day, rain it will for forty days afterwards. The moon, even by philoſophers, is ſuppoſed to indicate the weather; but the vulgar regard her as foretelling it, much in the ſame manner that other omens preſage future events. If ſhe change in the ſouth-weſt quarter, *i. e.* if ſhe change about four or five o'clock in the afternoon, when the ſun is in the ſouth-weſt, it portends rain; if in the north, or north-eaſt, *i. e.* at that time of the evening when the ſun, if we ſuppoſed him not to ſet, would be in the north or north-eaſt, cold weather is portended. Catholics bleed their horſes on St. Stephen's day, and on the feſtival called Annunciation.

The unlucky omens in England are, to ſee one magpye, and then more; but to kill a magpye is a terrible misfortune. It is alſo unlucky to kill a ſwallow, or more properly the houſe marten. If, on a journey, a ſow croſſes the road, the perſon, if he cannot paſs it, muſt ride round about, otherwiſe bad luck will attend his journey. If a lover preſents a knife or any thing ſharp to his miſtreſs, it portends that their loves will be cut aſunder, unleſs ſhe take a pin, or ſome other trifling article in exchange. To find a knife or a razor portends diſappointment: a piece of coal, ſtarting from the fire, of a hollow form, portends death. To ſpill the ſalt, or lay the knife and fork acroſs each other at table, is very ominous: if there be in company thirteen, which is called the devil's dozen, ſome misfortune will befall one of them. The noiſe of the ſmall inſect called a death-watch, foretells death; and the ſcreech-owl at midnight, ſome terrible misfortune.

If the cheek burns, or the ear tingles, it is a ſign that ſome perſon is talking of one; and the coming of ſtrangers is foretold by what is called "a thief" in the candle. Friday is an unlucky day to be married, and yellow is an ominous colour for an unmarried woman to wear; in plucking a "merry-thought," the perſon who gets the largeſt ſhare will be married before the other.

In the Highlands omens are numerous: it is unlucky to ſtumble at the threſhold, or to be obliged to return for any thing forgot. To ſtep over a gun, or a fiſhing-rod, ſpoils ſport. If, when the ſervant is making a bed, ſhe happens to ſneeze, the ſleep of the perſon who is to lie in it will be diſturbed, unleſs a little of the ſtraw (with which moſt beds in the Highlands were, till very lately, filled) is taken out, and thrown into the fire. If a black cloud, on New Year's eve, is ſeen, it portends ſome dreadful calamity, either to the country, or to the perſon over whoſe eſtate or houſe it appears. The day of the week on which the third of May falls is deemed unlucky throughout the year. Friday is conſidered as unlucky for many things, eſpecially for digging peat, or taking an account of the ſheep or cattle on the farm. Under the perſuaſion, that whatever is done during the waxing of the moon grows, and whatever is done during her waning decreaſes and withers, they cut the turf which they intend for fences, and which, of courſe, they wiſh to grow, when the moon is on the increaſe; but the turf which they intend for fuel, they cut when ſhe is on the wane, as they wiſh it to dry ſpeedily. If a houſe take fire during the increaſe of the moon, it denotes proſperity; if during her wane, poverty. In the iſland of Mull, the firſt day of every quarter is deemed fortunate; and Tueſday is the moſt lucky day for ſowing their corn. The lucky omens in the Highlands are not many, and in general they are the ſame as thoſe in other countries: one, however, ſeems peculiar to them,

them, it is deemed lucky to meet a horſe. In the Orkneys, Friday, which in moſt other places is reckoned an unfortunate day for this purpoſe, is generally choſen for marriage; next to it, Thurſday is fixed upon; and the time when the moon is waxing is the moſt fortunate. When an Orkney fiſherman is ſetting off from the ſhore, he takes eſpecial care to turn his boat in the direction of the ſun's motion; if he neglected this, he would not expect good luck. In the lowlands of Scotland, good or bad fortune throughout the year is thought to depend greatly upon the perſon who is firſt ſeen on New Year's morning, or the "firſt foot," as it is called; if the "firſt foot" be that of a friend, and a fortunate perſon, the ſubſequent year will be fortunate. Under this idea, as ſoon as ever twelve o'clock at night announces the commencement of the New Year, it is cuſtomary, even in Edinburgh, to ſecure a lucky "firſt foot" to one's friends, even though it ſhould be neceſſary to enter their chamber when they are faſt aſleep.

OMEN *Prærogativum*, among the Romans, was the vote of the firſt tribe or century in their comitia.

When a law, &c. was propoſed, or an election to be made, an urn was brought in to the prieſts there preſent, into which were caſt the names of the tribes, or centuries, or curiæ; as the comitia were either tributa, centuria, or curiata. And the lots being drawn, that tribe, century, &c. whoſe name came up firſt, was called *tribus*, or *centuria prærogativa*, becauſe their voices were aſked firſt. And ſo much did the Romans depend on this prerogative century, that the reſt generally followed them. Hence a perſon who had the voices of the prerogative was ſaid to have *omen prærogativum*.

OMENTAL RUPTURES, in *Surgery*. See EPIPLOCELE and HERNIA.

OMENTUM, in *Anatomy*, a part contained in the abdomen, and called in common language the caul. See EPIPLOON.

OMER, in the *Jewiſh Antiquity*. See CORUS.

OMERA, in *Geography*, a town of Arabia, in the province of Yemen; 16 miles N. of Aden.

OMEREE, a town of Hindooſtan, in the circar of Ellickpour; 20 miles S.W. of Ellickpour.—Alſo, a town of Hindooſtan, in Boggilcund; 6 miles W. of Rewah.

OMEREQUI, a town of Peru, in the dioceſe of La Plata; 50 miles N. of La Plata.

OMERGONG, a town of Hindooſtan, in Baglana; 7 miles S. of Damaun.—Alſo, a town of Hindooſtan, in the circar of Aurungabad; 32 miles E. of Aurungabad.

OMERPOUR, a town of Hindooſtan, in the circar of Aurungabad; 40 miles E. of Aurungabad.

OMETEPEC, a river of Mexico, which runs into the Pacific ocean, N. lat. 16° 52'.—Alſo, a ſmall iſland in the lake of Nicaragua; 25 miles E. of Nicaragua. N. lat. 11° 30'. W. long. 86° 6'.

OMEY, an iſland off the weſt coaſt of the county of Galway, Ireland. It appears to have been the ſeat of the pariſh church. N. lat. 53° 31'. W. long. 10° 7'.

OMI, or OITS, a large lake in the iſland of Niphon, 100 miles in length, and 10 in breadth; 15 miles N.E. of Meaco.

OMILPALLAH, a town of Hindooſtan, in the circar of Mahur; 42 miles N.W. of Mahur.

OMISSION, in *Rhetoric*. See PARALEPSIS.

OMITA, in *Geography*, a town of Hindooſtan in Guzerat; 28 miles E. of Cambay.

OMITTAS, in *Law*. See NON OMITTAS.

OMLI, in *Geography*, a town of Norway; 40 miles N.N.E. of Chriſtianſand.

OMMAGANG, a town of Norway; 48 miles S. of Porſanger.

OMMEN, a town of Holland, in the department of Overiſſel, on the Vecht; 18 miles S.E. of Covorden.

OMMIRABIH. See MORBEYA.

OMMO ZAIDI, a country of Africa, on the coaſt of Ajan, 70 miles from the ſea, about N. lat. 6°.

OMNES, in the *Italian Muſic*, a Latin term, which we ſometimes find uſed for *tutti*, *all*, or *altogether*.

OMNIUM is a term of finance, denoting all the particulars included in the contract between government and the public for a loan; ſuch as ſtock at three or four *per cent.*, lottery-tickets at a ſtipulated price, annuities for a certain term, &c.

OMO, in *Geography*, a ſmall iſland in the Eaſt Indian ſea, near the E. coaſt of Amboyna. S. lat. 3° 31'. E. long. 128° 51'.

OMOA, or *St. Franciſco de Omoa*, a fortified ſea-port town of Mexico, in the province of Honduras. This is a fortreſs of importance, as it is the key of Honduras, and in time of war, the receptacle of the treaſure ſent from Guatimala. N. lat. 15° 50'. W. long. 89° 53'.

OMÖE, a ſmall Daniſh iſland, in the Great Belt; 10 miles S. of Corſoer. N. lat. 55° 10'. E. long. 11° 10'.

OMOHYOIDEUS, or OMOPLATOHYOIDEUS, in *Anatomy*, a muſcle of the neck. See DEGLUTITION.

OMOLEY SINAB, in *Geography*, a town of Algiers; 34 miles S. of Conſtantina.

OMOLON, a river of Ruſſia, which runs into the Kolima; 20 miles E.S.E. of Niznei Novimſkoi.

OMONPHON, a ſmall iſland in the Eaſt Indian ſea, near the coaſt of Samar. N. lat. 11° 7'. E. long. 125° 45'.

OMONT, a town of France, in the department of the Ardennes, and chief place of a canton, in the diſtrict of Meziérés; 10 miles S. of Charleville. The place contains 484, and the canton 5151 inhabitants, on a territory of 107½ kiliometres, in 13 communes.

OMOPHAGI, formed of ωμος, *crude*, and φαγω, *I eat*, among the ancient geographers, a name given to certain nations who fed on raw fleſh, as the Scythians, &c.

OMOPHORIUM, formed from ωμος, *ſhoulder*, and φερω, *I bear*, a little cloak, anciently worn by the biſhops over their ſhoulders, thereby to repreſent the good ſhepherd, who brings home the ſtrayed ſheep on his ſhoulders.

For this reaſon the omophorium was put off at the opening of the Goſpels; becauſe then the true ſhepherd, Jeſus Chriſt, was ſuppoſed preſent in perſon.

Some confound the omophorium with the pallium worn by the patriarchs; but there was this difference, that the pallium was a long cloak of purple, and was peculiarly reſerved for patriarchs; though ſince given to ſome biſhops, by way of diſtinction.

OMOPLATA, in *Anatomy*, from the Greek ωμοπλατη, the ſcapula.

OMPANORATE, an appellation given to the prieſts of the iſland of Madagaſcar.

Theſe are the ſchoolmaſters of the country, and teach Arabic and writing. They have ſeveral books, but none of them contain more than ſome chapters of the Alcoran, and a few phyſical recipes.

They are divided into ſeveral orders, bearing ſome reſemblance to our eccleſiaſtical dignities; as *ombiaſſe*, ſecretary or phyſician; *tibon*, ſubdeacon; *mouladzi*, deacon; *faquihi*, prieſt; *catibon*, biſhop; *lamlamaha*, archbiſhop; *ompitſiquili*, prophets or diviners; *ſabaha*, calif, or the chief of the religion.

The ompanorates deal much in taliſmans, and other charms, which

which they call *hitidzi*, and which they ſell to the grandees of the place. They alſo make little ſtatues, or images, called *auli*, which they conſult as oracles, and to which they aſcribe various powers; as the making rich, deſtroying enemies, &c. They have public ſchools, where they teach their ſuperſtitions and ſortileges.

The *ompitſiquili* practiſe geomancy, and are moſtly conſulted on diſeaſes, and the ſucceſs of affairs; reſolving all queſtions by figures drawn on a little table covered with ſand.

OMPHACION, ομφακιον, derived from ομφαξ, *unripe grape*, in *Pharmacy*, the juice of ſour or unripe grapes.

Some have alſo given the name to a kind of oil, pretended to be drawn from olives, while yet green and ſour. But Pomet charges it as an impoſture, adding that olives yield no oil at all till perfectly ripe.

OMPHACITIS, a name given by naturaliſts to a ſmall ſort of gall of the oak.

OMPHACOMELI, a ſort of oxymel made of the juice of unripe grapes and honey.

OMPHALEA, in *Botany*, a name altered by Linnæus, the genus having been originally called *Omphalandria*, in Browne's Hiſtory of Jamaica, p. 334. The word is derived from Ομφαλος, and alludes to the umbilicated ſhape of the anthers.—Linn. Gen. 479. Schreb. 657. Willd. Sp. Pl. v. 4. 569. Swartz. Prodr. 95. Obſ. 349. Mart. Mill. Dict. v. 3. Juſſ. 392. Lamarck Dict. v. 4. 548. Illuſtr. t. 753. Aubl. Guian. 842.—Claſs and order, *Monoecia Monadelphia*. Nat. Ord. *Tricoccæ*, Linn. *Euphorbiæ*, Juſſ.

Gen. Ch. Male Flowers, *Cal.* Perianth inferior, of four or five ovate, ſpreading leaves, the two oppoſite ones larger, convex, coloured. *Cor.* none. Nectary of four glands; making a fleſhy ring round the filament. *Stam.* Filament columnar, thick, ſhort; anthers two or three, oblong, incumbent, connate at their tops, bearing pollen at their edges; when there is a ſingle anther, it is convex or flat and three-cleft. Female Flowers in the ſame cluſter with the males. *Cal.* Perianth inferior, of five leaves, three of them larger, ovate, ſurrounding the germen. *Cor.* none. *Piſt.* Germen ſuperior, roundiſh, very ſhort; ſtyle none; ſtigma three-cleft, broadiſh, obtuſe. *Peric.* Capſule oblong or roundiſh, fleſhy, obtuſely triangular, of three cells and three valves. *Seed.* Nuts ſolitary, ovate, hard.

Eſſ. Ch. Male, Calyx of four leaves. Corolla none. Nectary a fleſhy ring. Filament columnar, the anthers inſerted into it. Female, Calyx of five leaves. Corolla none. Stigma three-cleft. Capſule fleſhy, three-celled. Nuts ſolitary.

1. O. *diandra*. Linn. Sp. Pl. 1377. Aubl. Guian. t. 328. (O. cordata; Swartz. Prodr. 95. Obſ. 350. Omphalandria fruteſcens diffuſa, foliis amplioribus ovatis, petiolis biglandulis, racemis terminalibus; Browne Jam. 334.) —Cluſters compound, leafy, terminal. Leaves ſcattered, heart-ſhaped, villoſe beneath, biglandular at the baſe. Stem climbing.—Native of rocky, ſhrubby ſpots in Jamaica, and other parts of the Weſt Indies. *Stems* ſhrubby, roundiſh, downy, rather divided and diverging. *Leaves* alternate, ſtalked, heart-ſhaped, pointed, coriaceous, thick, entire, ſmooth, downy beneath; footſtalks long, lax, biglandular. *Stipulas* ſmall, lanceolate, deciduous. *Cluſters* terminal, compound, branched, diverging, looſe. *Bracteas* lanceolate, obtuſe, ſmooth, placed at the baſe of each ſimple cluſter of *flowers*, which are numerous, ſmall and green. *Capſule* yellowiſh, containing three brittle *nuts*, with oblong angular *kernels*.

2. O. *triandra*. Linn. Sp. Pl. 1377. Amoen. Acad. v. 5. 408. (O. nucifera; Swarts. Prodr. 95. Obſ. 351. t. 10. f. 6. Omphalandria foliis obovatis glabris, ad baſin biglandulis; floribus triandris; Browne Jam. 335, but not his t. 22. f. 4, according to Swartz.)—Cluſters compound, leafy, terminal. Leaves oblong, biglandular at the baſe. Stem arboreous.—Native of woods in Jamaica, and not unfrequently cultivated there. This *tree* is from twelve to fifteen feet high, erect, with a ſmooth bark. *Branches* ſpreading horizontally, deflexed and rather divided. *Leaves* alternate, ſtalked, elliptically elongated, ſcattered, drooping, attenuated, and bearing two glands at the baſe, obtuſe at the end, entire, ſmooth, ribbed; footſtalks deflexed, long, roundiſh, ſmooth. *Cluſters* terminal, amongſt the leaves, ſolitary, compound, drooping, lax. *Nuts* very hard, black, their kernels white, ſurrounded with a yellow membrane. The nuts, which are highly flavoured, are eſculent; and the ſtalks and branches emit an aqueous fluid. The Engliſh at Jamaica call this tree *Cobnut*, and the French *Noiſettier*.

We think the reaſon given by Swartz for changing the Linnæan ſpecific names of the above two ſpecies, is by no means ſatisfactory, as his other two diandrous ones are now made a new genus, *Epiſtylium*, in his Fl. Ind. Occ. 1095.

OMPHALOBIUM, ſo called by Gærtner, from ομφαλος, *the navel*, and λοβος, *a pod* or *legume*, is, if we miſtake not, no other than *Connarus monocarpus* of Linnæus. Juſſieu perceived its affinity to *C. africanus*; ſee his Gen. 453, and Gærtn. t. 46. The name alludes to a depreſſion on each ſide of the ſcar, or *umbilicus*, of the ſeed.

OMPHALOCELE, from ομφαλος, *the navel*, and κηλη, *a ſwelling*, a term in *Surgery*, ſignifying a rupture of the navel. See HERNIA.

OMPHALODES, in *Botany*, ομφαλωδης, from ομφαλος, *the navel*, was adopted by Tournefort for the name of a genus which he founded upon ſome plants referred by Linnæus, perhaps not correctly, to CYNOGLOSSUM; ſee that article. The plants in queſtion are very remarkable for the umbilicated form of their ſeed-caſes, and in other reſpects differ greatly from *Cynogloſſum*.

The ſame word is retained as the ſpecific appellation of a *Lichen*, to which it is by no means excluſively ſuitable, though taken from its characteriſtic denomination in Vaillant. The term is equally applicable to the ſhields of a great number of neighbouring ſpecies, at ſome period or other of their growth.

OMPHALOMANTIA, a word uſed by ſome authors to expreſs a ſort of divination pretended to by the midwives and old women, of telling how many more children a woman is to have, by examining the number of knots on the umbilical cord.

OMPHALOPTER, or OMPHALOPTIC, in *Optics*, a glaſs that is convex on both ſides, popularly called a convex lens.

OMPHALOTOMIA, from ομφαλος, and τεμνω, *to cut*, the operation of dividing the navel-ſtring.

OMPHALUS. See ENTEROMPHALUS, EXOMPHALUS, and HYDROMPHALUS.

OMPHALUS, in *Natural Hiſtory*, a term uſed by the ancients to expreſs what they at other times call *umbunculus* in ſtones; that is, a ſmall round and prominent ſpot, in the centre of the ſtone.

The zmilampis, which was a kind of oculus beli found in the Euphrates, had uſually a blue prominent pupil, and this was called omphalus, and umbunculus, indifferently, and ſo in other ſtones. The words have both the ſame origin, and are uſed to expreſs its being like the button, or prominent piece, in the middle of a ſhield called by the Greeks *omphalos*, and by the Latins *umbo*.

OMPHAX, the name the ancients gave to a gem of the

pellucid kind, and of a diſagreeable greeniſh colour, with a mixture of yellow. Pliny, and ſome other old writers, make this a kind of the aqua marine, calling it the *berillus oleaginus;* but the earlier writers very juſtly determined it not to be of the beryl kind, but properly a diſtinct ſpecies of gem; and therefore very properly called it by a peculiar generical name.

OMPOMPANOOSUCK, in *Geography*, a furious but ſhort river of Vermont, which, after purſuing a S.W. courſe, diſcharges itſelf into the Connecticut at Norwich, oppoſite to Dartmouth college.

OMPTAH, a town of Bengal; 21 miles W. of Calcutta.

OMRAUTTY, a town of Hindoſtan, in the country of Berar; 20 miles S.S.E. of Ellickpour. N. lat. 20° 55'. E. long. 78° 16'.

OMSK, a town and fortreſs of Ruſſia, in the government of Tobolſk, on the river Om, when it unites with the Irtiſch, built in 1716, and well garriſoned. N. lat. 55°. W. long. 74 54'.

OMTCHOU, a river of Thibet, which runs into the Nitchon, near Tarendſang.

OMTRAGER *la Lumière* of a pipe, in *Organ Building*, is ſoldering to the ſides of the mouth two ſmall plates of the ſame metal; theſe plates are called *ears*. By opening and cloſing theſe ears, pipes of this kind are tuned.

OMURA, in *Geography*, a town of Japan, in the iſland of Ximo; 15 miles N.N.E. of Nangaſaki.

OMY, in *Agriculture*, a provincial term employed to ſignify mellow, when ſpoken of land. It is often written *oamy*.

ON, in *Scripture Geography*, called alſo *Onion* and *Onium*. See HELIOPOLIS.

There were two cities of the ſame name, the one, as Pliny terms it, interior, and the other without, of leſs note, really ſituated in Arabia, and modern in compariſon with the former. It lay to the E. of the Nile, and to the S. of the Arabian canal, at the diſtance of 12 miles from Babylon, and 24 from Memphis. It is mentioned, ſays the learned Bryant, by ſeveral writers, under the name of Heliopolis; but its true name was Onium, which it received from Onias, the ſon of Onias a Jew, who built it. Onias, as it has been ſaid, having fled from his own country, had a great inclination to build a temple in Egypt reſembling that at Jeruſalem, or rather in oppoſition to it. In effecting his purpoſe, he found great difficulty; and in order to gain the aſſent and aſſiſtance of his brethren, in that part of the world, he had recourſe to a prophecy (Iſaiah xix. v. 18, 19.) which he interpreted as favourable to his ſcheme. According to Scaliger, Onias was led to the choice of the prefecture of Heliopolis for erecting his temple by this prophecy; altering the expreſſion ſo as to render it more favourable to his deſign. His temple, however, was not founded in the nome of Heliopolis; and this name was given to it by a miſtake reſulting from a ſimilitude that ſubſiſted between the true name "Onion," and the ancient "On," or Heliopolis. Of this he availed himſelf, for rendering the paſſage in Iſaiah prophetic of the eſtabliſhment of his temple. The name indeed was given to it after it was built, and the prophecy was uſed to ſupport what was done rather than to promote it, ſo that there ſeems to have been a colluſion between Onias and thoſe of his party, to impoſe this name upon the place; in order that it might be entitled to the benefit of the prediction This is plain from the LXX, (Exod. i. 11.) where the words "On, which is the city of the Sun," are interpolated, in order to ſupport the pretenſions of Onias, and to prove that this was the name of the place which he had founded. According to this account, the city of Onias is ſaid to have been built when the Iſraelites had reſided ſome time in Egypt; for they are preſumed to be the builders; but there was another of the ſame name, the ancient On, previouſly mentioned in the ſame tranſlation; and was prior to their coming into theſe parts. It is ſaid that Joſeph, before the coming of his brethren, had married the daughter of the prieſt of On, at the recommendation of Pharoah, which On, the LXX very properly tranſlate Heliopolis. (See Gen. xli. 45.) Notwithſtanding the account given by Joſephus (Antiq. lib. xiii. c. 3.) of the temple of Onias, and the occaſion of its being built, Bryant conceives that the place allotted to him for this purpoſe was not Heliopolis, but Onium, the ſituation of which was exterior with reſpect to Egypt; and this was ſo ſimilar to the ancient On or Heliopolis, that it obtained that name; a name which it never received till after it was built; and then the prophecy was made uſe of by Onias and his friends to eſtabliſh the temple when finiſhed, and to ſanction their proceeding. Afterwards the Greeks in Egypt, hearing that the chief temple of the Jews was called Ονιον or Onium, imagined that this name was derived from ονος, ſignifying an aſs; and hence they concluded that they had diſcovered the ſecret object of the Jewiſh worſhip. This notion was ſoon propagated; and it was aſſerted, that in the veſtibule of every Jewiſh temple there was an aſs's head. This fable was, in proceſs of time, extended even to the Chriſtians, and they were denominated Aſinarii, and charged with having an aſs's head in their churches, as an object of worſhip. As this temple was built in imitation of that at Jeruſalem, it did not long ſurvive it. Veſpaſian, it is ſaid, gave orders for its deſtruction; though ſome writers defer the demolition of it to the time of Trajan: the temple upon mount Gerizim having been deſtroyed long before, probably when Hyrcanus took Samaria. See Bryant's Obſervations, &c. Diſſ. iii. p. 124, &c.

ON *the Beam*, any diſtance from the ſhip; or the wind is ſaid to blow, when on a line with the beams, or at right angles with the keel.

ON *the Bow*, an arch of the horizon, comprehending four points of the compaſs on each ſide of that point to which the ſhip's head is directed. Thus, ſeamen ſay, the ſhip in ſight bears three points *on the ſtarboard bow*, that is, three points towards the right hand from that part of the horizon which is right a-head.

ON *the Quarter*. Suppoſe the wind at eaſt, and a ſhip ſailing right before the wind, ſhe would have the wind quartering from north-weſt to ſouth-weſt, for at thoſe two points the wind would be on the ſtarboard or larboard quarter, according to what tack the ſhip was on. See ON *the Bow*.

ON-*Stand*, in *Agriculture*, a provincial term applied to the rent paid by the out-going to the in-coming tenant, for ſuch portions of ground as the former has rightly cropped before his leaving the farm.

ONA, in *Geography*, a river of Ruſſia, which runs into the Uda at Mongalova, in the government of Irkutſk.—Alſo, a town of Peru, in the dioceſe of Lima; 35 miles N.N.E. of Loxa.

ONABAS, a town of New Mexico, in the province of Hiagni; 16 miles N. of Riochico.

ONAGER, in *Zoology*, the name given by authors to the wild aſs, a creature common in Syria, and ſome other places, and differing very little more from the common aſs, than as creatures in their native wildneſs do from thoſe of the ſame ſpecies kept in ſtables, and brought up to be domeſtic animals. The ſkin of this creature is very robuſt and durable, and makes the common ſhagreen leather uſed by

our cafe-makers, &c. its furface being rough with fmall tubercles. See ASINUS.

ONAGRA, in *Botany*. See JUSSIÆA and ŒNOTHERA.

ONAGRÆ, the 88th natural order in Juffieu's fyftem, or the 6th of his 14th clafs, is fo called from *Onagra*, the Tournefortian name of the Evening Primrofe. (See ŒNOTHERA) For the characters of this clafs fee FICOIDEÆ. The *Onagræ* are ranged next to the order laft mentioned, and characterifed as follows.

*Calyx* of one leaf, tubular, fuperior; its limb divided, and either permanent or deciduous. *Petals* definite in number, inferted into the upper part of the calyx, alternate with its fegments. *Stamens* definite, inferted into the fame part, either equal in number to the petals, or twice as many, rarely more. *Germen* fimple, inferior; ftyle generally one; ftigma either fimple or divided. *Fruit* capfular or pulpy, inferior, rarely but half inferior, moftly of many cells, with numerous feeds, rarely of one cell only; fometimes crowned with the limb of the calyx; fometimes, from the falling off of that part, naked at the fummit. *Corculum* without albumen. *Stem* either herbaceous or fhrubby. *Leaves* alternate or oppofite.

*Section* 1. Style manifold. Intermediate genera between the *Onagræ* and *Ficoideæ*.—Here Juffieu places his *Mocanera* (*Vifnea* of Linn. Suppl.); *Vahlia* of Thunberg (fee OLDENLANDIA); and *Cercodea* of Solander, which is *Haloragis* of Schreber.

*Sect.* 2. Style one. Fruit capfular. Stamens equal in number to the petals.—This fection confifts of *Montinia*, *Serpicula*, *Circæa*, and *Ludwigia*.

*Sect.* 3. Style one. Fruit capfular. Stamens twice as many as the petals.—*Juffiæa*, *Œnothera*, *Epilobium*, *Gaura*, *Cacoucia*, Aubl. t. 179, *Combretum* and *Guiera*.

*Sect.* 4. Style one. Fruit pulpy.—Genera akin to the *Myrti*, but differing in the definite number of their ftamens.—Thefe are *Fuchfia*, *Petaloma* (Mouriria of Aublet), *Ophira*, *Bæckea*, *Memecylon*, *Jambolifera*, *Efcallonia*, *Sirium*, and *Santalum*.

*Sect.* 5. Genera akin to the *Onagræ*, but polyandrous *Mentzelia* and *Looſa* (or *Loaſa*).

The learned author of this order has made many fubfequent remarks and corrections refpecting it, in the Annales du Mufeum d'Hift. Nat. v. 3. 315, where he terms it, according to a new plan of nomenclature, *Onagrariæ*. His paper is tranflated in Dr. Sims and Mr. Konig's Annals of Botany, v. 1. 530.—Juffieu here adds to the fecond fection *Trapa* and *Lopezia*. He propofes to remove from the fourth *Efcallonia*, *Petaloma*, and *Bæckea*, and fpeaks doubtfully of *Jambolifera*, as not underftanding the various characters given of the latter by authors, becaufe they have defcribed different things under that name.—As to the firft fection mentioned above, he would remove *Mocanera* or *Vifnea* to his *Guaiacanæ*; and expreffes juft doubts concerning *Vahlia*. He rightly refers *Proſerpinaca* with *Myriophyllum* to the neighbourhood of *Cercodia* or *Haloragis*.

It is proper to obferve that what Juffieu, in this eſſay, terms the firft fection, is, in his Gen. Pl., as above, the third. This he fays is the richeft in genera, and he propofes to make no alteration therein, nor any addition thereto. It is in reality the cleareft in character and habit of the whole, comprizing the real *Onagræ*, all moft naturally allied in ftructure and habit to each other. See the various genera in their proper places.

ONANCOCK, in *Geography*, a town of America, in the ftate of Virginia. N. lat. 37° 45'. W. long. 75° 40'.

ONANG-SIUEN, a town of Corea; 40 miles S.S.W. of Kang.

ONANIA, and ONANISM, terms which fome late empirics have framed to denote the crime of felf-pollution, mentioned in fcripture to have been practifed by Onan, and punifhed in him with death. Some take it for the fame with what in other places of fcripture, particularly Levit. ch. xx. is called *giving of ſeed to Moloch*; for which the punifhment allotted is ftoning to death.

This is but ill warranted; the ableft critics make them quite different things. Selden is pofitive the Jews, in imitation of their neighbours, actually facrificed their children to Moloch. Others fancy they only made them pafs between two fires, in order to obtain the idol's favour and protection. See MOLOCH.

ONANO, in *Geography*, a town of Italy, in the Patrimonio; five miles S. of Aquapendente.

ONANS, a town of France, in the department of the Doubs; 12 miles N.W. of Blamont.

ONAPA, a town of New Mexico, in the province of Hiaqui; 40 miles N.N.E. of Riochico.

ONAS, a town of Japan, in the ifland of Ximo; 22 miles S. of Funai.

ONATE, a town of Spain, in Guipufcoa; 22 miles N.E. of Vittoria.

ONCA, in *Zoology*, a fpecies of the *felis*, in the Linnæan fyftem. See FELIS.

ONCHA, in *Geography*, a town of Hindooftan, in the circar of Gohud; 18 miles S. of Bandera.

ONCHIDIUM, ONCH, in *Zoology*, a genus of the Vermes Mollufca clafs and order; of which the generic character is as follows: Body oblong, creeping, flat beneath; mouth placed before; two feelers, fituate above the mouth; it has two arms, at the fides of the head; the vent is behind, and placed beneath.

There is only one fpecies, *viz.*

TYPHÆ. This is fully defcribed in the fifth volume of the Linnæan Tranfactions. It inhabits Bengal, on the leaves of the Typha elephantina; it is about an inch long, and three quarters of an inch broad, but linear and longer when creeping. In appearance it refembles a limax, but differs principally in wanting the fhield and lateral pore, and in being furnifhed with a vent behind. The body above is convex, afh-colour, and covered with irregular glandular tubercles; beneath it is flat and fmooth; the head is yellowifh, fmall, and placed beneath, which, when the animal is in motion, is perpetually changing its form and fize, and drawn in when at reft; the mouth is placed lengthways, and is continually varying in its fhape, from circular to linear; the feelers are retractile, refembling thofe of the flug, and apparently tipt with eyes; the arms are dilatable, folid, compreffed, and fomewhat palmate, when fully expanded.

ONCIDIUM, in *Botany*, fo named by profeffor Swartz, according to his own account, from ογκιδιον, *a tubercle*, in alluſion to a couple of prominences on the lip. His figure repreſents one of theſe as forming ſo perfect a hook, that we preſume he had in view alſo that ſenſe of the word ογκος. —Swartz. Act. Holm. for 1800. 239 t. 3. f. 2. Orchid. 77. t. 1. f. 2. Tracts on Botany, 180. t. 5. Willd. Sp. Pl. v. 4. 112.—Claſs and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*, Linn. Juſſ.

Gen. Ch. *Cal.* Perianth of three, rarely but two, ſtalked leaves. *Cor.* Petals two, larger than the calyx, ſomewhat wavy. Nectary a lip ſpreading from the baſe of the ſtyle, lobed; the central lobe large, with two prominences on the upper ſide of its diſk. *Stam.* Anther a roundiſh deciduous lid, of two cells, between the wings of the ſtyle; maſſes of pollen globular, in pairs, joined by a common ſtalk. *Piſt.* Germen inferior, ſlender, nearly cylindrical; ſtyle erect,

excavated

excavated in front, with two marginal wings at the ſummit; ſtigma concave, beneath the anther. *Peric.* Capſule oblong, ſlender, of one cell, opening between the ribs. *Seeds* numerous, minute, tunicated.

Eſſ. Ch. Calyx and petals ſpreading. Lip flat, with tubercles near the baſe. Anther a deciduous lid, between the wings of the ſtyle.

Obſ. This handſome genus is remarkable for the ſingular lobed form of the flower, and the panicled infloreſcence. All the known ſpecies are natives of the Weſt Indies.

1. O. *carthagenenſe.* Willd. n. 1. Sw. Ind. Occ. 1479. (Epidendrum carthagenenſe; Jacq. Amer. 228. t. 133. f. 4. Pict. 111. t. 214. E. undulatum; Sw. Prodr. 122. Curt. Mag. t. 777. Viſcum radice bulboſâ majus et elatius, delphinii flore ferrugineo guttato; Sloane Jam. v. 1. 250. t. 148. f. 1.)—Stem none. Leaves elliptical, flattiſh, fleſhy. Stalk radical, much branched. Petals roundiſh, with claws. Lip crenate.—This grows on trunks and large arms of trees in Jamaica. It flowered in May 1804, in Mr. Woodford's collection at Vauxhall. The *root* conſiſts of many thick fibres. *Leaves* a foot long, compared by Sloane to thoſe of the common White Lily. *Stalk* three to ſix feet high, much branched above, the ultimate branches bearing ſeveral large, alternate, nearly ſeſſile *flowers* towards their extremities. The *calyx* and *petals* are ſomewhat ſpatulate, whitiſh or yellow, variegated with ruſty brown and purple; the latter larger, paler, more wavy, and veiny. *Lip* of the ſame colours, with a ſmall violet-coloured diſk.—Swartz in his *Flora* puts a mark of doubt to the ſynonym of Jacquin. The colours of the *flowers* in the Bot. Mag. are more lurid, and apparently more natural than in Jacquin's figure.

2. O. *altiſſimum.* Willd. n. 2. Swartz. Ind. Occ. 1481. (Epidendrum altiſſimum; Jacq. Amer. 229. t. 141. Pict. 112. t. 215.)—Stem none. Leaves elliptic-lanceolate, bulbous at the baſe. Flowers in a long compound cluſter. Calyx and petals lanceolate. Lip emarginate.—Paraſitical on the trunks of trees, in Jamaica and other Weſt Indian iſlands. The *leaves* proceed each from a large oval furrowed bulb, and are about a foot long. *Flower-ſtalks* radical, ſolitary, bearing a compound cluſter, three or four feet in length, and more or leſs pendulous. *Flowers* yellow, ſpotted with brown, their *calyx-leaves* and *petals* ſeſſile, more lanceolate and leſs undulated than in the former. *Lip* inverſely heart-ſhaped, convex, emarginate, not undulated.

3. G. *tetrapetalum.* Willd. n. 3. Swartz. Act. Holm. 240. (Epidendrum tetrapetalum; Jacq. Amer. 230. t. 142. Pict. 112. t. 216.)—Stem none. Leaves awl-ſhaped, keeled. Flowers in a ſimple cluſter. Calyx-leaves ovate, wavy. Lip ſtalked, kidney-ſhaped.—Native of woods in Jamaica. We know this ſpecies only from the publications of Jacquin, who repreſents the *flowers* as purpliſh, fragrant, without *petals* (as we call them); for he deſcribes the lip and three calyx-leaves as compoſing a flower of four petals. The *cluſter* is ſhort and ſimple, growing on a radical ſtalk about a foot high. *Leaves* ſeveral, three or four inches long, not half an inch wide.

4. O. *variegatum.* Willd. n. 4. Swartz. Ind. Occ. 1483. (Viſcum delphinii flore albo guttato minus, radice fibroſâ; Sloane Jam. v. 1. 251. t. 148. f. 2.)—Stem none. Leaves lanceolate, channelled, recurved, with cartilaginous ſerratures. Cluſter ſhort. Lip two-lobed. Paraſitical on trees in the mountainous parts of the Weſt Indies.—It has the habit of the laſt, and like that ſeems to want real *petals*. The *lip* and *calyx* are white, ſpotted with red, according to Swartz, who ſays the beautiful *flowers* appear in April.

5. O. *Ceboletta.* Willd. n. 5. Swartz. Act. Holm. 240. (Epidendrum Ceboletta; Jacq. Amer. 230. t. 131. f. 2. Pict. 112. t. 217.)—Stem none. Leaves cylindrical awl-ſhaped, bulbous at the baſe. Cluſter compound, pendulous.—Native of woods, eſpecially near the ſea, at Carthagena. *Jacq.*—The *roots* creep on the branches of trees, bearing a crowd of little green bulbs, the ſize of hazel-nuts, each producing an erect *leaf*, not unlike that of a young onion, about a foot high. *Stalk* ſlender, much longer than the leaves, drooping, crowned by a ſhortiſh compound pendulous cluſter, which Jacquin ſaw in fruit only.

ONCINO, in *Geography*, a town of France, in the department of the Stura, on the Po; 14 miles W. of Saluzzo.

ONCOBA, in *Botany*, a genus of Forſkal's, ſo called from its Arabian name *Oncob.* Forſk. Ægypt-Arab. 103. Gmel. Syſt. Nat. v. 2. 828. Juſſ. 292. Lamarck Dict. v. 6. 210. Illuſtr. t. 471.—Claſs and order, *Polyandria Monogynia.* Nat. Ord. *Tiliaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, permanent, divided into four, deep, concave, obtuſe ſegments. *Cor.* Petals eleven or twelve, ſpreading, toothed; the outer ones longer than the calyx; the inner ſmaller, unequal. *Stam.* Filaments numerous, thread-ſhaped, erect, inſerted into the calyx; anthers erect, ſimple, linear. *Piſt.* Germen ſuperior, globoſe, longitudinally furrowed; ſtyle cylindrical, longer and thicker than the filaments; ſtigma orbicular, furrowed, ſeven-lobed. *Peric.* Berry globular, pulpy, of one cell, and many oblong, compreſſed *ſeeds*.

Eſſ. Ch. Calyx of one leaf. Petals numerous. Berry of one cell, many-ſeeded.

1. O. *ſpinoſa.* Gmel. Syſt. Nat. v. 2. 828.—Native of Egypt and Senegal, where it is called, according to Adanſon's herbarium, *Dimb*, or *Rimbot*. This is the only ſpecies known, being rather a lofty *tree*, with alternate, warty *branches*, each furniſhed with one or two *ſpines* about two inches long. *Leaves* alternate, ſhortly ſtalked, ovate, pointed, ſerrated, ſmooth. *Flowers* ſolitary, large, white. *Calyx* white internally. The *berries* are ſaid by Forſkal to be eaten by children.

ONCOS, ὄγκος, in *Antiquity*, was uſed to ſignify an ornament of the head, peculiar to thoſe who offered ſacrifice.

ONDA, in *Geography*. See *St.* VINCENT *de la Pazes*.

ONDARROA, a town of Spain, in Biſcay; eight miles W. of St. Sebaſtian.

ONDATRA, in *Zoology*. See MUS *Zibethicus*.

ONDEE, in *Heraldry*. See WAVED.

ONDEGGIARE, in the *Italian Muſic*, ſignifies to return the hand beating time, not directly, but by degrees; as *ondeggiare la mano*, to keep it waving in the air, or giving it two motions, before it is quite lifted up to end the bar, and thence to fall it to beat a firſt, ſecond, or third time, of that or another meaſure.

The Italians do not beat time merely by the two motions of *down* and *up;* but mark, by waving the hand, every portion of a bar. Suppoſe, for inſtance, a movement in common time of four crotchets in a bar, two accented and two unaccented: to the firſt accent the hand is beaten down; for the ſecond portion of the bar it is waved to the right; for the third to the left; and for the fourth and laſt part of a bar it is lifted up vertically, and comes down for the firſt note of the next bar, &c. In triple time of three portions, the hand comes down for the firſt, is waved to the right for the ſecond, and for the third lifted perpendicular.

ONDER BOKKEVELD, in *Geography*, a territory of Southern Africa, being one of the tranſmontane diviſions of Stellenboſch near the Cape of Good Hope. This is the elevated flat ſurface of a table mountain, whoſe ſides on the W. and

W. and N. are high and almoſt perpendicular rocks, piled on each other in horizontal ſtrata like thoſe of Table mountain at the Cape, but it deſcends with a gentle ſlope to the eaſtward, and terminates in Karroo plains. The graſſes on the ſummit are ſhort but ſweet, and the ſmall ſhrubby plants are excellent food for ſheep and goats. The horſes are among the beſt which the colony produces, and the cattle thrive well. In ſome of the valleys, where the grounds admit of vegetation, the common returns of wheat are 40, and of barley 60, for one, without any reſt for 20 years, without fallowing, and without manure. The ſoil is deeply tinged with iron, and abounds with maſſes of iron-ſtone. Barrow's Travels in Southern Africa, vol. ii.

ONE-BERRY, in *Botany*. See *Herb* PARIS.

ONE-*Blade*. See SMILAX.

ONE-*Wheel Plough*. See PLOUGH.

ONEEHEOW, in *Geography*, one of the Sandwich iſlands in the N. Pacific ocean, lying five leagues to the weſtward of Atooi, and not above fifteen leagues in circuit. The eaſtern coaſt is high and riſes abruptly from the ſea, but the reſt of the iſland conſiſts of low ground; excepting a round bluff head in the S.E. point, which terminates in a round hill. It produces abundance of yams, and of the ſweet root called "Tee." Here is ſalt, which the natives call "Patai," and is produced in ſalt ponds. With this they cure both fiſh and pork; and their ſalt fiſh kept very well, and was found to be very good. When captain Cook viſited this iſland in January 1778, ſix or ſeven canoes came off with ſome ſmall pigs and potatoes, and a good many yams and mats. The people reſembled thoſe of Atooi, and ſeemed to be equally acquainted with the uſe of iron, which they aſked for by the names of "Hamaite" and "Toe," parting readily with all their commodities for pieces of this precious metal. Many of them came readily on board, crouching down upon the deck, and not quitting this humble poſture till they were deſired to get up. The women, who were left in the canoes, behaved with much leſs modeſty than thoſe of Atooi, and at times all of them joined in a ſong, not remarkable for its melody, though performed in very exact concert, by beating time upon their breaſts with their hands. It appears certain, that the horrid banquet of human fleſh is as much reliſhed here, amidſt plenty, as it is in New Zealand. Some of the people, in anſwer to queſtions put to them on this ſubject, replied without heſitation, that if their navigators were killed on ſhore, they would certainly eat them. Their meaning plainly ſeemed to be, that they would not deſtroy them for the ſake of eating them, but that their eating of them would be the conſequence of previous enmity. One of the men had punctured on his breaſt the figure of a lizard, and upon thoſe of others were the figures of men badly imitated. This iſland had no chief or "hairee," but was ſubject to Teneoonao, a chief of Atooi. The ſoil of this iſland was found to be very poor and ſtony; but it was covered with ſhrubs and plants of more delicious fragrance than any which occurred in any other iſlands viſited in this ocean. There was no appearance of any running ſtream; but ſome ſmall wells were found, in which the freſh water, which was ſcarce, was tolerably good. The habitations of the natives were thinly ſcattered about; and it was ſuppoſed that there could not be more than 500 people upon the iſland. Their mode of living ſeemed to be decent and cleanly; but the men and women were not obſerved to eat together, and the latter ſeemed to aſſociate in companies by themſelves. It was found that they burn here the oily nuts of the "dooe dooe" for light in the night, as at Otaheite; and that they baked their hogs in ovens; but, contrary to the practice of the Society and Friendly iſlands, they ſplit the carcaſes through their whole length. The "taboo," or as they called it, "tapoo," was found to exiſt in this iſland, for one woman fed another who was under that interdiction. They alſo obſerved ſome other myſterious ceremonies. A particular veneration ſeemed to be paid here to owls, which are very tame; and it was obſerved to be a pretty general practice among them to pull out one of their teeth, in which they agreed with Dampier's natives on the W. ſide of New Holland, although at ſuch an immenſe diſtance; for this practice the only reaſon they aſſigned was, that it was "teeha," which is the reaſon given for another of their practices, the giving a lock of their hair. Cook's Third Voyage, vols. ii. iii. N. lat. 21° 50'. E. long. 199° 45'.

ONEG, a town of Ruſſia, in the government of Archangel, on the river Onega, near the White ſea; 80 miles S.S.W. of Archangel. N. lat. 63° 35'. E. long. 37° 24'.

ONEGA, a river of Ruſſia, which riſes in the N.W. part of the government of Vologda, and runs into the White ſea.—Alſo, a lake of Ruſſia, in the government of Olonetz, between the Ladoga and the White ſea. The length is between 180 and 200 verſts, and its breadth from 60 to 80. Like the Ladoga it contains a few iſlands conſiſting of marble, and in all other properties is much the ſame. As from the Onega the navigable river Svir runs into the Ladoga, and from the Bielo-Ozero the Shakſna flows into the Volga, a canal cut through the diſtance of 40 verſts would connect the Neva with the Volga, and afford a more convenient navigation than the paſſage by Viſhnoi-Volotſhok, becauſe there are no water-falls, and therefore all the danger and trouble attending them in the preſent paſſage would be obviated. Tooke's Ruſſ. vol. i.

ONEGLIA, or ONEILLA, a ſea-port and capital of a principality, on the coaſt of the Mediterranean, which carries on a conſiderable trade in olive-oil. It is well built, and had formerly a large and good citadel, which has been deſtroyed. In October 1792 the French attacked it both by land and ſea, and having taken it by ſtorm, ſurrendered it to a general plunder, and afterwards ſet fire to it in ſeveral places; 30 miles N.E. of Nice. N. lat 43° 55'. E. long. 8° 4'.—Alſo, a principality ſurrounded on all ſides, except towards the ſea, by the territory of the Genoeſe. It conſiſts of three vallies, *viz.* Oneglia, Maro, and Prela. The firſt is covered with fruit-trees, intermixed with houſes, ſo as to have the appearance of a continued orchard. Maro, or Mairo, extends from the village of St. Lazara to the col of St. Bernard, where it joins the valley of Piéva, in the juriſdiction of the Genoeſe. The third valley of Pierrelata, or Prela, lies to the W. of the other two. All theſe vallies extend 19 miles from the ſea, and in them are reckoned 53 towns or villages, 3000 families, 14,000 inhabitants, and 2000 men fit to bear arms. The country produces wines, fruits, and excellent olive-oil. The capital is Oneglia.

ONEIDA, a county of New York, bounded N.E. and E. by Herkemer county, S.E. by Otſego county, S. by Oneida lake and Chenango, and W. by lake Ontario. This county, 90 miles from N. to S. and from 40 to 60 from E. to W., is well watered and the ſoil is fertile. The number of inhabitants is 22,047.

ONEIDA *Creek*, a river of New York, which runs into lake Oneida. N. lat. 49° 3'. W. long. 75° 47'.

ONEIDA *Lake*, a lake of America, in the ſtate of New York, between 20 and 30 miles long, and five miles wide; it is connected with lake Ontario on the W. by Oſwego river, and with fort Stanwix by Wood creek.

ONEIDAS, one of the Six Nations of Indians, containing 628 perſons, who inhabit the country S. of Oneida lake, called the Oneida Reſervation. Their principal village,

Kahaomerolakala is about 20 miles S.W. of Whiteſtown. This nation receives an annuity from the ſtate of New York of 3552 dollars for lands purchaſed of them in 1795, and an annuity of about 628 dollars from the United States. Theſe annuities, together with the corn, beans, and potatoes, raiſed by the ſquaws, and the fiſh and game caught by the men, afford them a barely tolerable ſubſiſtence. Their pride leads them to deſpiſe their neighbours, the Stockbridge and Brotherton Indians, for their attention to agriculture; but being under a neceſſity of purchaſing proviſions of them, they begin to feel a ſenſe of their dependence. They are divided into three tribes, or clans, by the names of the Wolf, the Bear, and the Turtle. They have their name from their Pagan deity, which ſome few of the natives ſtill worſhip, notwithſtanding the inſtruction of miſſionaries from the ſociety eſtabliſhed in Scotland for promoting Chriſtian knowledge; which deity is merely a mis-ſhapen, rude, cylindrical *ſtone*, about 120 pounds in weight, in their language called "Oneida," ſignifying the "Upright Stone." Formerly this ſtone was placed in the crutch of a tree, and then the nation ſuppoſed itſelf invincible. Theſe Indians are all of mixed blood; inſomuch, that there has not been a *pure* Oneida for ſeveral years paſt.

ONEIROCRITICA, ονειροκριτικη, the art of interpreting dreams, or a method of foretelling future events, by means of dreams.

The word is formed from the Greek, ονειρος, *dream*, and κριτικη, of κρισις, *judgment*. Some call it *oneirocratia*, and derive it from ονειρος, and κρατεω, *I poſſeſs*, *I command*. It appears from ſeveral paſſages of ſcripture, that there was, under the Jewiſh diſpenſation, ſuch a thing as foretelling future events by dreams; but then there was a particular gift, or revelation, required for that purpoſe.

It ſhould ſeem, hence, that dreams are really ſignificative, and do forebode ſomething to come; and all that is wanting among us is the oneirocritica, or the art of knowing what: yet it is the opinion of many, that dreams are mere chimeras; bearing, indeed, ſome relation to what has paſſed, but none to what is to come. As to the caſe of Joſeph, it was poſſible for God, who knew all things, to diſcover to him what was in the womb of fate; and, to introduce that, he might take the occaſion of a dream; not but that he might as well have foretold it from any other accident or circumſtance whatever: unleſs God, to give the matter more weight, ſhould purpoſely communicate ſuch a dream to Pharoah, in order to fall in with the popular notion of dreams and divination, which then prevailed among the Egyptians. See DREAM.

ONEIROCRITICS, formed from ονειρος, *dream*, and κρισις, *judgment*, a title given to interpreters of dreams, or thoſe who judge of events from the circumſtances of dreams.

There is no great regard to be had to thoſe Greek books called oneirocritics; nor do we, indeed, know why the patriarch of Conſtantinople, and others, ſhould amuſe themſelves with writing on ſo mean a ſubject.

Rigault has given us a collection of the Greek and Latin works of this kind; one attributed to Aſtrampſichus; another to Nicephorus, patriarch of Conſtantinople; to which are added, the treatiſes of Artimedorus and Achmet. But the books themſelves are little leſs but reveries; a kind of waking dreams, to explain and account for ſleeping ones.

The ſecret of oneirocriticiſm, according to them all, conſiſts in the relation ſuppoſed to be between the dream and the thing ſignified; but they are far from keeping to the relations of agreement and ſimilitude; and frequently they have recourſe to others, of diſſimilitude and contrariety.

ONEIROPOLI, ονειροπολοι, or *Oneiroſcopi*, in *Antiquity*, perſons whoſe buſineſs it was to make predictions from dreams.

ONEMACK POINT, in *Geography*, the S.W. point of the continent of North America, on the N.W. coaſt, and the S. limit of Briſtol bay; 82 leagues S.S.W. of cape Newenham, on the N. point of that extenſive bay. N. lat. 54° 30′. W. long. 163° 30′.

ONEMENSKAIA, a lake of Ruſſia, in the river Anadyr; 208 miles below Anadyrſkoi, communicating with the gulf of Anadyr.

ONERANDO *Pro Rata Portionis*, in *Law*, a writ which lies for a joint-tenant, or tenant in common, when diſtrained for more rent than the proportion of his land comes to.

ONESON, in *Geography*, a town of Nubia, on the left bank of the Nile; 30 miles N.E. of Sennaar.

ONEVI, one of the ſmaller Friendly iſlands, in the South Pacific ocean, near the N. coaſt of Tongataboo; 5 miles N.E. of Obſervatory Point.

ONEZSKOE, a lake of Ruſſia, in the government of Olonetz; 120 miles long, and about 40 at its medial breadth; containing ſeveral iſlands. N. lat. 61° to 67°. E. long. 29° to 31°.

ONFZANI, a town of European Turkey, in Moldavia; 31 miles N.N.E. of Saſſi.

ONGAR, or CHIPPING-ONGAR, a market-town and pariſh in the hundred of Ongar, and county of Eſſex, England, is ſituated at the diſtance of 10 miles W. by S. from Chelmsford, and 21 miles N.E. from London. The town is ſuppoſed to be of great antiquity, and to have been of conſiderable importance, firſt under the Romans, and ſubſequently under the Saxons and Normans. After the conqueſt, a ſtrong caſtle was erected here by Richard de Lucy, who was chief juſtice of England in the reign of Henry II. A high mount, called the Keep, and ſome other remains of this fortreſs, are ſtill viſible on the eaſt ſide of the town; and from their extent and magnitude would induce the belief of the caſtle having been formed out of a fortification of ſtill greater antiquity and dimenſions. A wide and deep moat, commonly filled with water, ſurrounds the keep. A ſteep winding walk, now ſhaded with a thick plantation of trees and ſhrubs, leads to the ſummit.

Chipping-Ongar is now only a trifling place, and conſiſts of one long and wide ſtreet. The church, a ſmall ſtructure, is remarkable for the caſtellated loop-hole appearance of its windows. Within the church is a monument in honour of Jane, daughter of lord Oliver Cromwell of Hinchinbrooke, in Huntingdonſhire. The market-day in this town is Saturday weekly, and there are two fairs every year. According to the parliamentary returns of 1811, the whole pariſh contained 120 houſes, and 678 inhabitants.

About a mile from Ongar ſtands the village of Greenſted, which particularly deſerves notice on account of its church. This is regarded by antiquaries as one of the moſt ancient and curious ſpecimens of architecture in our iſland. The nave is entirely compoſed of the trunks of oak trees, ſplit or ſawn aſunder, and fixed upright in a ſill and plate, cloſe to each other. "On the ſouth ſide are ſixteen, and two door-poſts; on the north twenty-one, and two vacancies, filled up with plaſter. The weſt end is built againſt by a boarded tower; and the eaſt by a chancel of brick; on the ſouth ſide is a wooden porch, and both ſides are ſtrengthened by thick buttreſſes: the roof is of later date, and tiled." The total length of the wooden portion of the church is twenty-nine feet nine inches; the width fourteen feet; and the height, to the ſpring of the roof, five feet ſix inches.

According

According to tradition, this edifice was erected as a temporary ſhrine for the corpſe of one of our ancient kings; and Smart Lethieullier, eſq. ſtates that the body of St. Edmund, when on the way to its place of ſepulture at St. Edmund's Bury, was "entertained at Aungre (Ongar), where a wooden chapel erected to his memory remains to this day." Contiguous to the church is the ſeat of Craven Ord, eſq. one of the maſters in chancery.

At Fyfield, a mile north-eaſt from Ongar, a variety of Celts were diſcovered in 1749: and near Naveſtock, a ſeat of the earl of Waldegrave, is an ancient monument, ſuppoſed by Stukeley to be a Druid temple of the kind which he called Alate.

Otes, four miles to the north of this town, was the ſeat of the lords Maſhams, and diſtinguiſhed as the retreat of the celebrated John Locke, who died here in 1704, and lies buried under a plain altar in the village church-yard, having an inſcription upon it from his own pen. Camden's Britannia by Gough, vol. ii. folio. Beauties of England and Wales, vol. v. by E. W. Brayley, and John Britton, F. S. A.

ONGERCURRY, a town of Hindooſtan, in the province of Cattack; 22 miles E. of Guntoor.

ONG-KIN, a town of Corea; 58 miles S.W. of Hoang.

ONG-LAKE, a river of Madagaſcar, which runs into the bay of St. Auguſtine.

ONGLEE, or ONGLE, is uſed by the French heralds to denote the talons or claws of beaſts or birds, when of colours different from the body.

ONGLET, in *Ornithology*. See TANAGRA *Striata*.

ONGOA, in *Geography*, a town of Africa, in the country of Mocaranga; 80 miles N.W. of Maſſapa.

ONGOBOLU, one of the ſmaller Friendly iſlands; 6 miles E. of Neneeva.

ONGOLE, a circar of Hindooſtan, in the Carnatic, E. of Cuddapa, and S. of Guntoor.—Alſo, the capital of the above circar, ſituated in the northern part of the Carnatic; 65 miles N. of Nellore. N. lat. 15° 30′. E. long. 78° 58′.

ONGO-MANCAN, a town of Chineſe Tartary. N. lat. 43° 32′. E. long. 121° 22′.

ONI, a town of Imiretta; 65 miles N.E. of Cotatis.

ONIDA, a ſmall iſland in the gulf of Venice. S. lat. 44° 42′. E. long. 14° 47′.

O-NIMAMOU, a harbour on the S.E. coaſt of the iſland of Ulietea; N.E. of Ohetuna, a harbour on the ſame coaſt.

ONION, CAPE, a cape on the S.W. ſide of Newfoundland iſland, about four leagues W. of Quirpon iſland, or the northern point of that extenſive iſland.

ONION *River*, a river of America, in the ſtate of Vermont, formerly called "French River," and by the Indians "Winooſki," which riſes in Cabot, about 14 miles W. of Connecticut river, and is navigable for ſmall veſſels five miles from its mouth, in lake Champlain, between the towns of Burlington and Colcheſter, and for boats between its ſeveral falls. This is ſaid to be one of the fineſt ſtreams in Vermont; and it runs through a very fertile country, the produce of which, for ſome miles on each ſide of the river, is brought down to the lake at Burlington. It is from 20 to 30 rods wide, to the lower falls, and 15 or 20 rods, 40 miles from its mouth, and its deſcent in this interval is 172 feet, or about four feet *per* mile. Between Burlington and Colcheſter it has forced a paſſage through a ſolid rock of lime-ſtone, which at ſome remote period muſt have formed at this place a prodigious cataract. The chaſm is between 70 and 80 feet in depth at low water, and in one place 70 feet from rock to rock, where it is traverſed by a wooden bridge. At Bolton there is a chaſm of the ſame kind, and the rock is at leaſt 130 feet high. From one ſide ſeveral rocks have fallen acroſs the river, ſo as to form a natural bridge at low water, but in a ſituation that renders it merely an object of curioſity. The Indians formerly paſſed along this river from Canada, when they made their attacks on the frontier ſettlements, on Connecticut river. Morſe.

ONJONG-MASSANG, a town on the W. coaſt of Sumatra, on the Line. E. long. 99° 21′.

ONIONS, in *Botany*, *Gardening*, *Dietetics*, and the *Materia Medica*. See ALLIUM.

ONIONS, *Sea*. See SQUILL.

ONION-*Shell*, in *Natural Hiſtory*, a name given by authors to a peculiar kind of oyſter, which is of a roundiſh figure and very thin and tranſparent, and repreſents very exactly a piece of the peel of an onion. See OSTREA.

ONIS, in *Geography*, a town of Spain, in Aſturias, ſituated E. of Cangas de Onis, at the foot of a mountain, and upon the little river Curado.

ONIS, *Cangas de*, a town of Spain, in Aſturias, ſituated at the confluence of two rivers, one of which, the Sella, is croſſed by a beautiful bridge of one arch. This town has the freedom of a municipal adminiſtration. This and the laſt-mentioned town lie in the road from Oviedo to Santa Cruz.

ONISCUS, in *Ichthyology*, a name given by Athenæus, and others of the Greek writers, to the acipenſer, or ſturgeon.

ONISCUS is alſo the officinal name of the whiting. See GADUS *Merlangus*.

ONISCUS, in *Entomology*, a genus of inſects of the order Aptera; of which the generic character is: Jaw truncate, denticulate; lip bifid; the antennæ are ſetaceous, and are from two to four in number; the body is oval, conſiſting of about fourteen tranſverſe ſegments; and it has fourteen legs. There are forty-three ſpecies, ſeparated into two ſections. They all feed on animal and vegetable matter, and caſt their ſkin. The ſea oniſci are larger than thoſe of the freſh water, having ten inſtead of ſeven ſegments. Their motions in the water are rapid, for beſides the feet, they are aſſiſted by lateral threads, which puſh them forward like the oars of a boat. Among them, the act of copulation is ſaid to laſt ſeveral days; when the male ſeizes his female with his two fore-feet, and drags her along with him wherever he directs his courſe. On the ſeventh day after impregnation the young iſſue from the mother alive, and ſwim about with vigour and alertneſs. The ſea oniſci are ſuppoſed to be viviparous; thoſe of the land oviparous: the former are of a pale red colour for ſome time after being excluded from the ſhell.

Diviſion A. Theſe have no feelers; they have frequently four antennæ, that are ſeſſile. This diviſion compriſes the Cymothoa of Fabricius, and contains thirty-eight ſpecies, of which ten, as will be marked in the deſcription, are common to our own country.

Species.

PARADOXUS. This ſpecies has the ſegments of the body falcate and ſpinous. It is found in Terra del Fuego, and is a large inſect.

IMBRICATUS. Antennæ compreſſed; legs furniſhed with claws; hind-thighs carinate. It inhabits New Zealand: it is large, oblong, and pale.

FALCATUS. The ſegments of the body of this are fal-

cate and two-ſpined at the ſides. It inhabits the Chineſe ocean.

* Asilus. Abdomen covered with two ſcales; the tail is ſemi-oval. It inhabits the European ocean.

Gaudaloupensis. The abdomen of this inſect is covered with ſix ſcales; the tail is ovate, entire. It inhabits the American ocean.

* Oestrum. Abdomen covered with ſix ſcales; the tail retuſe. It is found in European ſeas.

* Entomon. Abdomen naked beneath; tail oblong, acute. It inhabits the European ocean, and preys on ſmall fiſh.

* Aquaticus. The tail is rounded, with forked ſtyles; it has four antennæ. This is found in ſtagnant waters in many parts of Europe. The young are contained in a ſix-cleft follicle.

* Marinus. Semi-cylindrical; tail oval-oblong, pointed. It inhabits the European ſeas.

* Linearis. Body linear; tail four-toothed. It inhabits the European and Indian ſeas.

Chelipes. Oblong; tail three-toothed; legs ſlightly chelate. It is found in the Atlantic among ſea-weed.

Bicaudatus. Semi-cylindrical, with two tails as long as the body. It inhabits the ſeas of Norway.

Scopulorum. Body pale yellow with brown ſtreaks. Inhabits the ſeas of Norway.

Americanus. Abdomen covered with twelve ſcales; hind-legs long and ruſous; tail rounded. It inhabits the American ocean.

Psora. Abdomen naked beneath; tail ſemi-oval, acute. It inhabits Norway.

* Physodes. Abdomen naked beneath; tail ovate. It inhabits Europe.

* Bidentatus. Abdomen naked; tail very obtuſe, the laſt ſcale two-toothed. In this the body is very minute, and marked on the upper ſide with ſix tranſverſe rows of ochreous ſpots; the ſcales are even, the laſt with two teeth.

Spinosus. Body oblong, ſpinous and pellucid. It is found in the Atlantic ocean; the body is gelatinous.

Acuminatus. Oblong, grey; antennæ and legs paler; tail pointed. It inhabits the ocean.

Emarginatus. This is oblong and of a grey-brown; the tail is emarginate. It inhabits the ocean.

Albicornis. Oblong, brown; tail pale, dotted with black. It inhabits the Spaniſh ſeas.

Ceti. Ovate, with diſtinct ſegments; third and fourth pair of legs linear and unarmed. It inhabits the northern ſeas, and infeſts the whale; hence its ſpecific name.

* Oceanicus. Ovate; tail ending in two bifid ſtyles. It inhabits the European ocean.

Serratus. Ovate, brown; tail with five plates; the outer ones ſerrate without. It inhabits the Spaniſh coaſt, and is ſmall.

* Assimilis. Ovate; tail obtuſe, unarmed; body cinereous. It inhabits Europe.

Corallinus. Lanceolate; above brown; tail oblong-triangular, and crenate.

Aculeatus. The thorax is naked; the back is beſet with three rows of ſpines. It is found in the White ſea.

Scorpioides. Thorax oval-globular; tail long, jointed, ending in a ſpine and bifid briſtles. This alſo is an inhabitant of the White ſea; as is the next.

Cuspidatus. Thorax articulate, tuberculate; the ſix dorſal ſegments cuſpidate.

Hecticus. Cinereous, linear; tail linear, bicuſpidate, with two linear ſtyles. It is an inhabitant of the Atlantic.

Tinea. Ovate; green ſpotted with black; the tail is rounded. It inhabits Denmark.

Tridentatus. This is flattiſh; the tail is compoſed of two plates, and is three-toothed. It inhabits Denmark.

Fuscus. This is of a brown colour; the ſhell is carinate with a white ſpot on the thorax. It is alſo found in Denmark.

Cicada. A little compreſſed, ſublinear, with four ſpurious bands; the upper antennæ ſhorter; tail ſmooth on the back. It inhabits the Greenland ſeas.

Medusarum. Compreſſed; front obtuſe; antennæ very ſhort and pendent; four hands compreſſed and cut. It is found under the folds of the Meduſa capillata.

Arenarius. This is ſlightly depreſſed before, carinate and ſubſerrate behind; it has four fore-legs cheliform and ſmooth; the antennæ are nearly equal.

Strœmianus. Compreſſed; four fore-legs cheliform and ſlightly toothed; the upper antennæ very ſhort. It inhabits the ſhores of Greenland: the body is of a violet colour.

Abyssinus. Sub-cylindrical; it has four fore-legs cheliform and one-toothed; the antennæ are ſubequal, ſetiferous and ſerrate at the baſe on the inner margin. It inhabits Greenland: the body is marked with white and ſaffron bands: it darts with great velocity in the water.

Diviſion B contains five ſpecies, of which two are common to our own country. They have unequal feelers, the hind ones longer; antennæ filiform.

Maculatus. Tail obtuſe and unarmed; the body is of a lead colour, with dotted white lines. It is found in Italy, and is twice the ſize of the armadillo to be deſcribed preſently; the body is marked with ſeven longitudinal white dotted lines.

Pustulatus. Black; with four red dots on the firſt ſegment, and two whitiſh ones on the reſt. It inhabits ſouthern Europe.

* Assellus; the Wood-louſe. Tail obtuſe, with two ſimple ſtyles. It is rather more than half an inch long; the colour is of a livid brown. It inhabits Europe in walls, rotten wood, and under ſtones; it preys on minuter inſects; it infeſts England and many other parts of Europe. The young are contained in a four-valved follicle under the abdomen of the mother.

Sylvestris. Tail with four ſtyles, the lateral ones longer. It inhabits France, and is leſs than the laſt.

* Armadillo; Millepede, or Medical Wood-louſe. The body of this inſect is of a grey-brown; the tail is obtuſe and entire; the body conſiſts of ten ſegments, the edges of which are white; it is longer than the aſſellus, of a darker colour, and a more poliſhed ſurface; but found in ſimilar ſituations: when ſuddenly diſturbed or handled it rolls itſelf up into a completely globular form, in the manner of the armadillo, hence its ſpecific name. See Millepedes.

ONISION, in *Geography*, a town of Perſia, in the province of Irak; 20 miles N. of Conſar.

ONKELOS, in *Biography*, a celebrated rabbi, who flouriſhed in the firſt century, and was author of the Chaldee Targum, (which ſee,) or tranſlation of the Pentateuch, which is called after his name. He was probably a contemporary with Jonathan Ben Uzziel, author of the Targum of the prophets, but by much the younger of the two. For according to the Jewiſh writers Jonathan was one of the principal ſcholars of Hillel, who died about the time of our Saviour's birth; while Onkelos ſurvived Gamaliel,

liel, the maſter of St. Paul, who was grandſon of Hillel, and who lived till within eighteen years of the deſtruction of Jeruſalem. It is ſaid that Onkelos aſſiſted at the funeral of Gamaliel, and contributed largely to the expence of it. Our own hiſtorian, Prideaux, is of opinion, that Onkelos was of older ſtanding than Jonathan, alleging, as one of the principal reaſons for adopting it, the purity of ſtyle in which his Targum is written; for the nature of this argument we again refer to the article TARGUM. The firſt Latin verſion of this work was made by Alphonſus de Zamora, and publiſhed in the Complutenſian edition of the Polyglot, in 1517, whence it was adopted into the Antwerp in 1572; into that of Le Jay at Paris, and alſo into our countryman Walton's, in 1657.

ONKOTOMY, formed from ογκος, *tumour*, and τεμνω, *I cut*, in *Surgery*, the operation of opening a tumour or abſceſs.

ONNA, in *Geography*, a town of Thibet; 15 miles N.N.W. of Morou Conghé.

ONOBA, or ONUBA, now *Moguer*, a town of Spain, in Bœtica, towards the S.W. at the bottom of a ſmall bay. Pliny places it at the confluence of the Luxia and the Unrium, and gives it the ſurname of "Æſtuarium," indicating its being ſituated on the ſea-coaſt, and thus diſtinguiſhing it from another *Onoba*, in the interior of the country, belonging to the Turduli.

ONOBRYCHIS, in *Botany*, is Tournefort's ſynonym for HEDYSARUM, ſee that article.

ONOCENTAURUS, a fabulous animal, ſuppoſed to be a compound of a man and an aſs. Ælian ſpeaks of onocentaurs. It was half man and half aſs, as the centaur was half man and half horſe. Lib. vii. cap. 9.

ONOCHORUS, in *Ancient Geography*, the name of one of the five principal rivers of Theſſaly, according to Herodotus and Pliny.

ONOCLEA, in *Botany*, was ſo called by Linnæus, from ονος, *a ſort of veſſel*, and κλειω, *to ſhut up*. He appears to have taken the idea from Mitchell, who gave the name of *Angiopteris* to this fern; which being compoſed of αγγειον, *a veſſel*, and πτερις, *a fern*, was juſtly, according to his rules, inadmiſſible, ſince another eſtabliſhed genus was called *Pteris*. Both appellations allude to the apparent capſules, ranged in a two-ranked ſpike, but which are, in fact, formed of the cloſely inflexed lobes of the frond, concealing the real ſeed-veſſels.—Linn. Gen. 559. Schreb. 756. Willd. Sp. Pl. v. 5. 287. Mart. Mill. Dict. v. 3. Juſſ. 15. Lamarck Illuſtr. t. 864. (Struthiopteris; Willd. Sp. Pl. v. 5. 288.) —Claſs and order, *Cryptogamia Filices*. Nat. Ord. *Filices dorſiferæ annulatæ*.

Eſſ. Ch. Capſules covering the back of the frond. Involucrum from the cloſely reflexed marginal ſegments of the leaf.

Obſ. At the ſuggeſtion of Mr. Brown in his Prodr. Nov. Holl. v. 1. 152, under *Stegania*, perfectly in uniſon with our own judgment, we combine the *Struthiopteris* of Willdenow with *Onoclea*, while we conſider every thing elſe, that has been at any time referred to this genus, except our third ſpecies, as foreign to it. (See GLEICHENIA.) Moſt of the *Onocleæ* of Swartz make a principal part of a new genus of Willdenow, *Lomaria*, Sp. Pl. v. 5. 289, and among them *Acroſtichum ſpicatum*, Linn. Suppl. 444. Sm. Ic. ex Herb. Linn. t. 49. In *Lomaria* the involucrum is uninterrupted, proceeding in like manner from the inflexed edge of the leaf, and covering the continuous maſs of capſules.

1. O. *ſenſibilis*. Linn. Sp. Pl. 1517. Swartz. Fil. 110. Michaux Boreal-Amer. v. 2. 272. (Filix mariana, oſmundæ facie racemifera; Pluk. Mant. 80. t. 404. f. 2. Polypodium virginianum, oſmundæ facie; Morif. ſect. 14. t. 2. f. 10.) —Barren fronds pinnate; leaflets decurrent, ſinuated; the upper ones confluent. Native of various parts of North America, in moiſt ſhady places. It has long been known in the more curious gardens of England. The *root*, of courſe, is perennial. *Fronds* ſeveral, about a foot and a half, or two feet, high, with long ſmooth ſtalks; the barren ones compoſed of ſeveral oblong leaflets, more or leſs deeply waved or ſinuated, the uppermoſt confluent, and all ſomewhat decurrent, ſmooth and of a thin texture, ſo delicate that, as we have heard, the frond ſoon fades after being drawn through the hand while growing; which Moriſon alſo relates on the authority of Simon Paulli. The fertile *fronds* have a totally different appearance, each leaflet reſembling a crowded ſpike of capſules, which it was actually taken to be by Mitchell, Linnæus, and the writer of this in the Memoirs of the Academy of Turin, v. 5. Now each ſuppoſed capſule is found to be a cloſely reflexed lobed leaflet, whoſe concealed under ſide is covered with innumerable minute bivalve *capſules*, each bound with an elaſtic ring, as in other ferns.

2. O. *Struthiopteris*. Swartz. Filic. 111. (Oſmunda Struthiopteris; Linn. Sp. Pl. 1522. Fl. Dan. t. 169. Gunn. Norveg. 1. t. 1. f. 1—3. Struthiopteris germanica; Willd. Sp. Pl. v. 5. 288.)—Barren fronds pinnate; leaflets ſeſſile, pinnatifid; their ſegments rather acute, regular in length.—Native of bogs in the moſt northern regions of Europe, as well as in ſome parts of Germany and Switzerland. This is a noble fern, three or four feet high, the barren *fronds* not much unlike *Aſpidium Filix mas* in general appearance, but larger, and ſcarcely crenate; the fertile ones more central and erect, with longer ſtalks, and compoſed of ſhorter leaflets, having the ſame beaded or jointed appearance as the former, from which we do not ſee how this plant can be generically divided. It is well worthy of a place in the bog bed of every curious garden.

3. O. *penſylvanica*. (Struthiopteris penſylvanica; Willd. Sp. Pl. v. 5. 289.)—Barren fronds pinnate; leaflets pinnatifid; their ſegments obtuſe; the lowermoſt elongated and acute.—Native of Penſylvania, from whence it was ſent by Dr. Muhlenberg to profeſſor Willdenow, who ſays it is very like the laſt, but different in the ſpecific characters above given.

ONOCROTALUS, in *Ornithology*, a ſpecies of *Pelecanus*; which ſee.

ONOFRIO, ST., the name of one of the famous conſervatorios at Naples. The boys of this conſervatorio wear a white uniform. We heard them perform in the church of Santa Maria di Loreto. The performance, in general, was coarſe and clumſy; genius and fire were diſcoverable now and then in the compoſitions of theſe ſtudents; but all was unfiniſhed. Theſe ſeminaries, which heretofore produced ſuch great profeſſors, ſeem at preſent to be but low in genius. However, ſince theſe inſtitutions, as well as others, are ſubject to fluctuations, after being languid for ſome time, like their neighbour Mount Veſuvius, they will, perhaps, blaze out again with new vigour.

We went a ſecond time to hear the boys of St. Onofrio, at the Franciſcans' church. They performed a Litany, that was compoſed by Durante; the reſt of the muſic, which ſeemed to be that of a raw and inexperienced compoſer, was by a young man, who beat time. There was again a ſolo on the inſtrument called "La Voce Humana;" it is of an agreeable tone, has a great compaſs, but was not well played

on. A concerto on the violin was likewiſe introduced, where hand and fire were diſcovered by the player, but no taſte or feeling.

We were admitted into the interior of the conſervatorio of St. Onofrio the next day, and viſited all the rooms where the ſtudents practiſe, eat, and ſleep. On the firſt flight of ſtairs was a trumpeter, ſcreaming upon his inſtrument till he was ready to burſt; on the ſecond was a French horn, bellowing in the ſame manner. In the common practiſing room there was a Dutch concert, conſiſting of ſeven or eight harpſichords, more than as many violins, and ſeveral voices, all performing different things, and in different keys: other boys were writing in the ſame room; but it being holiday time, many were abſent who uſually ſtudied and practiſed in this room. The jumbling them all together in this manner may be convenient for the houſe, and may teach the boys to attend to their own parts with firmneſs, whatever elſe may be going forward at the ſame time; it may likewiſe give them force, by obliging them to play loud in order to hear themſelves; but in the midſt of ſuch jargon, and continued diſſonance, it is wholly impoſſible to give any kind of poliſh or finiſhing to their performance; hence the ſlovenly coarſeneſs ſo remarkable in their public exhibitions; and the total want of taſte, neatneſs, and expreſſion in all theſe young muſicians, till they have acquired them elſewhere.

The beds, which are in the ſame room, ſerve for ſeats to the harpſichords and other inſtruments. Out of thirty or forty boys who were practiſing, we could diſcover but two who were playing the ſame piece. The violoncellos practiſe in another room; and the flutes, hautbois, and other wind inſtruments, in a third, except the trumpets and horns, which are obliged to fag, either on the ſtairs, or on the top of the houſe.

The only vacation in theſe ſchools, in the whole year, is in autumn, and that for a few days only: during the winter, the boys riſe two hours before it is light, from which time they continue their exerciſe, a hour and a half at dinner excepted, till eight o'clock at night; and this conſtant perſeverance, for a number of years, with genius and good teaching, muſt produce great muſicians.

ONOMANCY, or rather ONOMAMANCY, the art of divining the good or evil fortune which ſhall befall a man, from the letters of his name.

The word is ſuppoſed to be formed from the Greek ονομα, *name*, and μαντεια, *divination*. Indeed, there is ſomething ſingular in the etymology; for in ſtrictneſs, onomancy ſhould rather ſignify divination by aſſes; being formed from ονος, *aſinus*, and μαντεια: to ſignify divination by names, it ſhould be *onomatomancy*.

Onomantia was a very popular and reputable practice among the ancients. The Pythagoreans taught, that the minds, actions, and ſucceſſes of men, were according to their fate, genius, and name; and Plato himſelf ſeems ſomewhat inclinable to the ſame opinion.

One of the greateſt rules of onomancy, among the Pythagoreans, was, that an even number of vowels in a name ſignified an imperfection in the left ſide of a man; and an odd number in the right. Another rule, about as good as this, was, that thoſe perſons were the moſt happy, in whoſe names, the numeral letters, added together, made the greateſt ſum; for which reaſon, ſay they, it was, that Achilles vanquiſhed Hector; the numeral letters in the former name amounting to a greater number than the latter.

And it was, doubtleſs, from a principle much of the ſame kind, that the young Romans toaſted their miſtreſſes at their meetings as often as there were letters in their names. Thus Martial,

"Nævia ſex cyathis, ſeptem Juſtina bibatur."

ONOMATOPŒIA, formed from ονομα, *name*, and ποιεω, *fingo*, *I feign*, in *Grammar* and *Rhetoric*, a figure of ſpeech, whereby names and words are formed to the reſemblance of the ſound made by the thing ſignified.

Thus in the word *trique-trac*, formed from the noiſe made by moving the men at this game: and from the ſame ſource ariſe the *buz* of bees, the *grunting* of hogs, the *cackling* of hens, the *ſnoring* of people aſleep, the *claſhing* of arms, &c.

The ſureſt etymologies are thoſe deduced from the onomatopœia.

ONONDAGO, or SALT *Lake*, in *Geography*, a lake of America, in New York, about ſix miles long and one broad, which diſcharges its waters to Seneca river. It derives its ſaltneſs from ſaline ſprings, a few miles from its banks, and furniſhes immenſe quantities of ſalt to the great benefit of the country.

ONONDAGO, a river of New York, which riſes in the Oneida lake, and runs weſtward into lake Ontario at Oſwego. It is paſſable by boats from its mouth to the head of the lake, 74 miles, except the interval of a fall which is 20 yards; and thence batteaux go up Wood creek almoſt to Fort Stanwix, 40 miles, whence there is a portage of a mile to Mohawk river. Towards the head of this river there is plenty of ſalmon.—Alſo, a county of New York, conſiſting of military lands, divided into nine townſhips: this county is bounded W. by Ontario county and N. by lake Ontario, the Onondago river and Oneida lake. The county courts are held in the village of Aurora, in the townſhip of Scipio. Onondago county is well adapted to inland navigation, on account of its two navigable rivers, Seneca and Oſwego, its five lakes and a number of creeks. The inhabitants are 7406.—Alſo, a poſt-town, and formerly the chief town of the Six Nations, ſituated in a pleaſant and fertile part of the country, on the S. end of the lake of the ſame name, and conſiſted of five ſmall towns or villages.

ONONDAGOES, a tribe of Indians, who live near Onondago lake. Between 20 or 30 years ago they could furniſh 260 warriors. This nation, now conſiſting of 450 perſons, receives annually from the ſtate of New York 2000 dollars, and from the United States about 450 dollars. N. lat. 42° 58′. W. long 75° 40′.

ONONGHOUAGO, a town of America, in New York, ſeated on the Suſquehanna; 13 miles E. of Chenango.

ONONIS, in *Botany*, an ancient Greek name, occurring both in the works of Theophraſtus and Dioſcorides; but whether their Ονωνις is comprehended in the preſent genus we cannot confidently ſay. At any rate their plant was a ſort of Vetch, and of the ſame claſs and natural family with the preſent *Ononis*, and its name, derived from ονος, *an aſs*, and ονημι, *to delight*, implies that it was grateful food to thoſe animals.—Linn. Gen. 370. Schreb. 490. Willd. Sp. Pl. v. 3. 988. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 758. Ait. Hort. Kew. ed. 1. v. 3. 21. Thunb. Prodr. 129. Juſſ. Gen. 354. Lamarck Dict. v. 1. 505. Illuſtr. t. 616. Gærtn. t. 154. (Anonis; Tournef. t. 229.)—Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, almoſt as long as the corolla; cloven into five, linear ſegments, ſlightly arched upwards; the loweſt under the keel. *Cor.* papilionaceous; ſtandard heart-ſhaped, ſtriated, depreſſed at the ſides more than

than the other petals; wings ovate, half the length of the ſtandard; keel acuminated, generally longer than the wings. *Stam.* Filaments ten, forming an undivided cylinder; anthers ſimple. *Piſt.* Germen ſuperior, oblong, villoſe; ſtyle ſimple, aſcending; ſtigma obtuſe. *Peric.* Legume turgid, rhomb-ſhaped, ſomewhat hairy, ſeſſile, of one cell and two valves. *Seeds* few, kidney-ſhaped.

Eſſ. Ch. Calyx in five linear ſegments. Standard ſtriated. Legume turgid, rhomboid, ſeſſile. Filaments in one undivided ſet.

Obſ. Only thirty-one ſpecies of this numerous and rather ornamental genus are enumerated in the 14th edition of the *Syſtema Vegetabilium;* fourteen of which, with the addition of *O. geminata*, are all that the firſt edition of the *Hortus Kewenſis* contains. Profeſſor Martyn deſcribes thirty-ſix ſpecies; and Willdenow, including thoſe of Thunberg from the Cape of Good Hope, has given ſixty-eight. Theſe are divided into five ſections, from each of which we purpoſe to give examples of the moſt intereſting, or handſome, plants.

Sect. 1. *Flowers nearly ſeſſile.*

O. *arvenſis*. Reſt-Harrow. Cammock. Sm. Fl. Brit. 758. Engl. Bot. t. 682. (O. ſpinoſa *β*, Linn. Sp. Pl. 1006.)—Stem hairy. Branches at length ſpinous. Flowers moſtly ſolitary. Leaves generally ſimple, entire towards their baſe. This is the only Britiſh ſpecies, and may be found very generally in the borders of barren, ſandy fields, by way ſides, and by the ſea-ſhore, flowering from June to September. —*Root* perennial, woody, blackiſh. *Stems* rather erect or procumbent, annual, round, woody, leafy, hairy, ſpinous when old. *Leaves* alternate, ſtalked, elliptically wedge-ſhaped, linear, roughiſh; the lower ones often ternate. *Stipulas* very large, ovate, embracing the ſtem, toothed. *Flowers* axillary, ſolitary, ſlightly ſtalked, elegantly roſe-coloured. *Seeds* dotted with tubercles.

With reſpect to the varieties of *O. arvenſis*, which have been conſidered as forming ſeparate ſpecies, Dr. Smith remarks, "We are perſuaded the *O. ſpinoſa*, Syſt. Veg. ed. 14. 651, is only the *arvenſis* or *inermis*, in an older or more ſtarved ſtate, and alſo that the *O. repens*, Linn. Sp. Pl. 1006, is merely a procumbent, maritime variety. *O. antiquorum* of Linnæus really appears not to differ from *arvenſis*." Willdenow thinks differently, but we cannot yield to his opinion without further means of judging reſpecting it.

O. *hircina*. Stinking Reſt-Harrow. Willd. n. 3. Jacq. Hort. Vind. v. 1. 40. t. 93.—Flowers ſomewhat ſpiked, in pairs. Lower leaves ternate; upper ſolitary, rather hairy. Branches villoſe.—Found in various parts of the continent of Europe. It flowers at Kew from May to Auguſt.—*Root* perennial, hard, woody. *Stems* procumbent in the lower part, aſcending upwards. *Leaves* ovate, acutely ſerrated, ſmooth above, hairy beneath. *Stipulas* ſerrated, embracing the ſtem. *Flowers* on very ſhort ſtalks, of a beautiful purple or red colour. *Legume* brown and rather hairy. The whole herb has a very ſtrong, diſagreeable ſmell, reſembling that of goats, and is never ſpinous.

O. *minutiſſima*. Small-flowered Reſt-Harrow. Linn. Sp. Pl. 1007. Jacq. Auſtr. v. 3. 23. t. 240. (O lutea ſylveſtris minima; Column. Ecphr. p. 1. 304. t. 301.)—Flowers lateral. Leaves ternate, ſmooth. Stipulas ſword-ſhaped. Calyx rough, longer than the corolla.—Native of the ſouth of Europe, flowering in June and July. *Root* perennial, woody, branched. *Stems* numerous, upright, generally ſimple. *Leaves* alternate, ſtalked, fringed with hairs. *Stipulas* lanceolate, pointed, glandular at the edge. *Flowers* ſeſſile, ſolitary, ſmall, yellow. Legume pointed, dark brown.

Sect. 2. *Flowers on awnleſs or ſimple ſtalks.*

O. *pubeſcens*. Linn. Mant. 267. Willd. n. 20. (O. Moriſoni; Gouan. Illuſtr. 47. Anonis purpurea procumbens verna ſeu præcox fruticoſa annua viſcoſa, ſiliquis craſſioribus lentiformibus rarius diſpoſitis; Moriſ. Hiſt. v. 2. 168.)—Flower-ſtalks very ſhort. Upper leaves ſimple. Stipulas ovato-lanceolate, entire.—Native of the ſouth of Europe, and found by Gouan in the Balearic Iſlands. *Stem* a foot high, branched, diffuſe, round. *Lower leaves* ternate; leaflets ovate or oval, obtuſe, acutely ferrated. *Flowers* many together, chiefly towards the ends of the branches, purple. We know of no figure of this ſpecies. It is entirely covered with a ſort of viſcid downineſs.

O. *perſica*. Willd. n. 21. Burm. Ind. 157. t. 49. f. 1. —Stalks bearing two flowers, racemoſe. Leaves ternate, wedge-ſhaped, three-toothed. Spike leafy, terminal.—Native of Perſia. *Stem* ſcarcely a ſpan long, procumbent, looſely branched. *Leaflets* ſhortly ſtalked, wedge-ſhaped. *Stipulas* and *bracteas* lanceolate, embracing the ſtem. *Flowers* purple, in leafy, terminal ſpikes.

O. *laxiflora*. Willd. n. 38. Desfont. Atlant. v. 2. 146. t. 190.—Stalks ſingle-flowered, longer than the leaf. Leaves ternate, obovate, ſerrated. Stipulas roundiſh. Legumes villoſe, nodding.—Found upon the uncultivated hills at Algiers. *Root* annual. *Stem* erect, branched, hairy. *Leaflets* obovate, toothed, ſcarcely downy. *Flowers* axillary, ſolitary, inclining to a blue colour.

O. *ceniſia*. Linn. Mant. 267. Villars. Dauph. v. 3. 433. Allion. Pedem. v. 1. 319. t. 10. f. 2.—Stalks ſingle-flowered. Leaves ternate, wedge-ſhaped. Stipulas ferrated. Stems proſtrate.—Native of Mount Cenis. *Stems* three or four inches long, ſlightly branched, ſmooth. *Leaflets* ſmooth, roundiſh at the end, delicately ſerrated. *Flowers* ſolitary, ſtriated, purple. Villars and Allioni conſider the *O. reclinata* of Linnæus to be merely a variety of this.

Sect. 3. *Flowers on awned or bearded ſtalks.*

O. *Cherleri*. Linn. Sp. Pl. 1007. Desfont. Atlant. v. 2. 148.—Stalks ſingle-flowered. Leaves ternate, toothed at the end, viſcid and hairy. Calyx longer than the corolla. —Native of Spain, Italy, and Barbary. *Root* woody. *Stem* procumbent, lax. *Leaves* nearly ſeſſile. *Stipulas* lanceolate, ſerrated. *Flowers* axillary, their *ſtalks* erect, but nodding with the *legume*.

O. *Natrix*. Linn. Sp. Pl. 1008. Curt. Mag. t. 329. (O. lutea; Camer. Epit. 445.)—Stalks ſingle-flowered. Leaves ternate, viſcoſe. Stipulas entire. Stem rather ſhrubby.—Found about hedges in France and Spain. *Root* large and wrinkled. *Stems* about a foot high, more or leſs erect. *Leaflets* oblong, toothed at the end. *Flowers* ſolitary, large, yellow, ſtreaked with red. The whole plant is viſcid, and has a reſinous ſmell.

Sect. 4. *Shrubby.*

O. *tridentata*. Linn. Sp. Pl. 1009. Cavan. Ic. v. 2. 41. t. 152.—Stalks two-flowered. Leaves ternate, fleſhy, ſomewhat linear, three-toothed.—Found in ſeveral parts of Spain. *Stem* a foot and half high, much branched; its *bark* white, downy, very ſlightly glutinous. *Leaves* ſtalked, glaucous. *Stipulas* ſhort, tapering. *Flowers* in terminal cluſters, roſe-coloured, on axillary, jointed ſtalks.

O. *fruticoſa*. Linn. Sp. Pl. 1010. Curt. Mag. t. 317. —Stalks about three-flowered. Leaves ſeſſile, ternate, lanceolate, ſerrated, ſtipulas ſheathing.—Native of mountains in Dauphiny, and other parts of the ſouth of Europe. This is a very beautiful low ſhrub, with numerous, woody *ſtems* about two feet high, jointed and branched. *Leaves* rather fleſhy, ſmooth, and ſhining. *Flowers* on long ſtalks, panicled,

panicled, terminal, about three together, large, lilac or roſe-coloured. Authors mention a variety of this ſpecies with white flowers.

O. *rotundifolia*. Linn. Sp. Pl. 1010. Curt. Mag. t. 355. —Stalks about three-flowered. Leaves ternate, roundiſh, toothed. Calyx of three, bracteated leaves.—Native of the Swiſs Alps. *Stem* round ſtriated, rather hairy, nearly two feet high. *Leaves* on ſtalks, ternate, the end leaflet larger and rounder than the others. *Stipulas* green, ſheathing, ſlightly ſerrated, ribbed. *Flowers* large and handſome, about three in a bunch, on long ſtalks, terminal, of a fine roſe-colour, though Miller, by miſtake, deſcribes them pale yellow. It is a taller plant than the laſt, with wider leaflets.

Sect. 5. *Dubious*.

In this ſection Willdenow enumerates ſix ſpecies, all taken from Thunberg's Prodromus, and natives of the Cape of Good Hope, and quite unknown to us.

ONONIS, in *Gardening*, contains plants of the ſhrubby kind, of which the ſpecies principally cultivated are; the yellow-flowered ſhrubby reſt-harrow (O. natrix); the three-tooth-leaved reſt-harrow (O. tridentata); the ſhrubby reſt-harrow (O. fruticoſa); and the round-leaved reſt-harrow (O. rotundifolia).

But there are other ſpecies both of the annual and perennial kinds, that may be cultivated for variety.

The third ſort varies with white flowers.

*Method of Culture*.—Theſe plants may be increaſed by ſeeds, cuttings, and ſlips, according to the different kinds.

The ſeeds of the firſt ſort ſhould be ſown upon beds of light earth in the early ſpring, as about April, thinly in drills, when they ſhould be properly thinned out during the ſummer months, and kept perfectly free from weeds; when in the beginning of the autumn they may be removed into the places where they are to remain. It may likewiſe be increaſed by cuttings planted out at the ſame time.

But though this ſort is pretty hardy when the winters are not very ſevere, a few plants ſhould always be kept in the greenhouſe. And as it is apt to grow out of form it ſhould be kept well cut in, and new plants be frequently raiſed from ſeeds.

Theſe plants cannot be preſerved in pots. They do not flower until the ſecond year.

The ſecond ſort ſhould have the ſeeds ſown in pots and placed in a mild hot-bed, or on a very warm ſheltered border, in the early ſpring; but the firſt is the beſt method, the plants being afterwards managed as tender plants, having either the protection of the greenhouſe or of mats.

The third ſort is raiſed from ſeeds ſown either in pots or warm borders in the early ſpring months. It ſucceeds beſt in ſhady ſituations where the ſoil is of a ſandy quality. The potted plants are often introduced in greenhouſe collections; but they are capable of withſtanding the ſeverity of moſt winters in the open air.

And the fourth ſort ſhould have the ſeeds ſown in the early ſpring on an open border, the plants being afterwards properly thinned and kept clear from weeds. It may likewiſe be raiſed from ſlips planted out at the ſame ſeaſon. It is very hardy, and requires little trouble in its cultivation.

Theſe are all plants which afford ornament and variety in the borders, or among other potted plants of the greenhouſe kind.

ONONYCHITES, formed from ονος, *aſs*, and ονυξ, *hoof*, ſomething that has hoofs like the feet of an aſs.

ONONYCHITES was an appellation which the heathens in the firſt century gave the God of the Chriſtians, becauſe they owned and adored the ſame God with the Jews.—For it was a notion (however it had its riſe), as appears from Tacitus, Hiſt. lib. v. cap. 3. that the Iſraelites, much afflicted with thirſt, were led to a ſpring by an aſs going to drink; and that, in gratitude for the benefit, they worſhipped an aſs; and that the Chriſtians did ſo likewiſe. See Tertull. Apol.

ONOPORDUM, in *Botany*, a name to be found in the works of Pliny, derived from ονος, *aſinus*, and πεδω, *pedere*. Profeſſor Martyn, by way of illuſtrating this derivation, ſays that it means *crepitus aſini*.—But from what cauſe this whimſical appellation is beſtowed on the preſent genus, it is difficult to determine. (See LYCOPERDON.)—Linn. Gen. 409. Schreb. 538. Willd. Sp. Pl. v. 3. 1686. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 856. Prod Fl. Græc. Sibth. v. 2. 155. Ait. Hort. Kew. ed. 1. v. 3. 146. Juſſ. 173. Lamarck Dict. v. 4. 555. Illuſtr. t. 664. Gærtn. t. 161.—Claſs and order, *Syngeneſia Polygamia Æqualis*. Nat. Ord. *Compoſitæ Capitatæ*, Linn. *Cinarocephalæ*, Juſſ.

Gen. Ch. *Common calyx* roundiſh, ventricoſe, imbricated with numerous, ſpinous ſcales, prominent every way. *Cor.* compound, tubular, uniform; the florets hermaphrodite, equal, each of one petal, funnel-ſhaped; tube very ſlender; limb erect, ventricoſe, cloven into five equal ſegments, one of them more deeply ſeparated. *Stam.* Filaments five, capillary, very ſhort; common anther cylindrical, tubular, the length of the corolla, five-toothed. *Piſt.* Germen ovate; ſtyle thread-ſhaped, longer than the ſtamens; ſtigma with a crown. *Peric.* none, except the permanent, ſlightly converging, calyx. *Seeds* ſolitary; down capillary, ſeſſile. *Recept.* ſcaly; the ſcales combined into cells, truncated, mucronated, ſhorter than the ſeeds.

Eſſ. Ch. Calyx ſwelling, its ſcales ſpreading and ſpinous. Receptacle cellular, a little ſcaly.

1. O. *Acanthium*. Cotton Thiſtle, or Woolly Onopordum. Linn. Sp. Pl. 1158. Engl. Bot. t. 977. Curt. Lond. faſc. 5. t. 57. Fl. Dan. t. 909.—Calyx-ſcales ſpreading every way, awl-ſhaped. Leaves ovato-oblong, ſinuated, woolly on both ſides.—This native of Britain, a very conſpicuous plant, occurs partially in waſte ground about towns, on a gravelly ſoil, flowering in July or Auguſt. —*Root* biennial, ſpindle-ſhaped. *Stem* erect, five feet high, branched, winged with decurrent, ſpinous *leaves*. *Flowers* terminal, ſolitary, erect, purple, very handſome and ſhowy. *Seeds* obovate, brown, ſhining; their down unequal, rough, deciduous, reddiſh.—The whole herb is clothed with a ſort of cottony web, which is eaſily rubbed off, and its ſeeds are ſaid to be a favourite food with the goldfinch, *Fringilla carduelis* of Linnæus.

2. O. *tauricum*. Tartarian Onopordum. Willd. n. 2. —Calyx-ſcales ſpreading every way. Leaves decurrent, ſmooth on both ſides, ſinuated, toothed, ſpinous.—Native of Tartary. Similar in habit to the laſt, but perfectly ſmooth in all its parts, and ſomewhat ſmaller.—This new ſpecies is given entirely on the authority of Willdenow, who drew his ſpecific character of it from a dried ſpecimen.

3. O. *macrocanthum*. Morocco or Long-ſcaled Onopordum. Willd. n. 3. Schouſb. Marocc. 198. t. 5.—Calyx-ſcales much ſpreading, as long as the calyx. Leaves decurrent, downy, ſinuated, toothed, ſpinous; radical ones pinnate.—Native of the empire of Morocco.—Dr. Sibthorp found it in the Archipelago.—This alſo is taken from Willdenow, who merely ſays that he ſaw a living ſpecimen

of it, and that it differs from *O. Acanthium* in having longer *calyx-ſcales*, and its radical *leaves* pinnate,

4. O. *illyricum*. Illyrian Onopordum. Linn. Sp. Pl. 1158. Jacq. Hort. Vind. v. 2. 69. t. 148.—Lower calyx-ſcales reflexed; upper much ſpreading. Leaves decurrent, downy, ſinuated, deeply toothed, and very ſpinous.—Native of the ſouth of Europe, flowering in July and Auguſt.—*Stem* ſix or ſeven feet high, branched from its baſe, broadly winged, and extremely ſpinous. *Leaves* long and narrow, ſcarcely exceeding the ſtem in width, of a greeniſh-white colour, deeply cut at their ſides into ovate or lanceolate ſegments, ſo as to be almoſt pinnatifid.—The habit of this magnificent ſpecies, whoſe purple *flowers* are ſaid by Jacquin to be ſometimes double the ſize of what he has figured, is alſo very ſimilar to that of the firſt ſpecies.

5. O. *deltoides*. Siberian Onopordum. Ait. Hort. Kew. ed. 1. v. 3. 146. Willd. n. 5.—Calyx ſquarroſe, webbed with down. Leaves ſtalked, ovate, angulated, downy beneath.—Native of Siberia. It flowers in Auguſt, and is perennial.—Introduced at Kew in the year 1784, by Mr. John Bell.—We know not that this is any where figured. The *leaves* reſemble thoſe of a Burdock.

6. O. *græcum*. Græcian Onopordum. Linn. Suppl. 349. Gouan. Obſ. 64. t. 25.—Calyx-ſcales ovato-lanceolate, mucronated. Leaves awl-ſhaped or lanceolate, decurrent, ſomewhat ſinuated, downy.—Native of the Levant. *Root* annual. *Stem* from one to three feet in height, very downy. *Radical-leaves* a foot or more in length, on a pinnatifid ſtalk, hoary with down. *Flowers* ſtalked, ſolitary, terminal, purpliſh.

7. O. *arabicum*. Arabian Onopordum. Linn. Sp. Pl. 1159. Jacq. Hort. Vind. v. 2. 70. t. 149.—Calyx-ſcales ovate, mucronated, adpreſſed. Leaves decurrent, rather downy, ſinuated, toothed, ſpinous.—Native of the ſouth of Europe, flowering in July.—This very handſome plant, whoſe large imbricated *calyx* is beautifully variegated, riſes to the height of ſix or eight feet. *Stem* erect, angular, hollow, branched. *Leaves* lanceolate, very ſharply ſpinous, beautifully veined and covered on both ſides with woolly down. *Flowers* erect, ſtalked, ſolitary, large, purple.

8. O. *uniflorum*. Single-flowered Onopordum. Willd. n. 8. Cavan. Ic. v. 1. 60. t. 88.—Stem none. Calyx cylindrical, ſeſſile; its ſcales ovate, mucronated, adpreſſed. Leaves ſtalked, woolly, toothed, ſpinous.—Native of Spain. *Root* ſpindle-ſhaped, brown. *Stem* none. *Leaves* all radical, nearly pinnatifid, covered with a white down, their ſegments terminated by a yellow ſpine. *Flower* ſolitary, ſeſſile. *Seeds* ſolitary, crowned with very long down. Willdenow remarks that this is ſimilar to the following, but that its leaves are not pinnatifid, whilſt its calyx-ſcales are mucronated and adpreſſed.

9. O. *acaulon*. Dwarf Onopordum. Linn. Sp. Pl. 1159. Jacq. Ic. Rar. t. 167.—Stem ſcarcely any. Calyx globoſe, nearly ſeſſile; its ſcales lanceolate, ſpinous, much ſpreading. Leaves on ſtalks, pinnatifid, toothed, ſpinous, downy.—Found by Dr. Sibthorp in Greece. It was cultivated in 1739, by Mr. Miller, and flowers in July and Auguſt.—*Root* biennial, ſpindle-ſhaped. *Stem* ſimple, about two inches long, terminated by a ſeſſile, red and white *flower*. *Leaves* cluſtered, of a beautiful glaucous hue, and ſpreading horizontally, ſo as to make the plant appear ſtemleſs.—Martyn conſiders the laſt ſpecies to be only a variety of this.

10. O. *rotundifolium*. Round-leaved Onopordum. Allion. Pedem. v. 1. 144. t. 38. f. 1. Willd. n. 10.—Stem nearly wanting. Calyx oblong, almoſt ſeſſile, its ſcales oblong-lanceolate, downy, without ſpines. Leaves ſtalked, roundiſh, heart-ſhaped, notched or toothed, without ſpines, downy.—Found in dry, ſtony places in Switzerland and Italy. *Root* thick and ſucculent. *Radical-leaves* about three or four, roundiſh, firm, thick, woolly and veined. *Flowers* compoſing a large, ſolitary, nearly ſeſſile, bell-ſhaped, head.

Profeſſor Martyn retains the *O. orientale*, Mill. Dict. n. 4. which is a native of Aleppo, and riſes with an upright, branching *ſtem*, ſeven or eight feet high. *Leaves* long and regularly ſinuated on their borders, like pinnatifid leaves. *Flowers* in large heads. *Calyx* very ſquarroſe and prickly.—Is it diſtinct from the following?

11. O. *elatum*. Tall Onopordum. Sm. Prodr. Fl. Græc. Sibth. v. 2. 156. Fl. Græc. (ined.) t. 833. (Carduus creticus, acanthi folio viridi et glutinoſo, flore purpuraſcente; Tourn. Cor. 31.)—Calyx-ſcales widely ſpreading, as long as the calyx. Leaves decurrent, ſinuated, toothed, ſpinous, hairy. Gathered in Crete by Tournefort and Sibthorp. *Root* biennial. Whole herb hairy all over, and of a green colour, not downy or woolly. The *flowers* are two or three inches broad.

ONORE, in *Geography*, a ſea-port town on the W. coaſt of Hindooſtan, in the country of Canara. When the Portugueſe firſt arrived in India, this town was the capital of a kingdom; which they firſt acknowledged as their ally and afterwards reduced to the condition of a ſubject. They erected a fortreſs for the ſecurity of their pepper trade; but the natives, aſſiſted by the Dutch, took it from them, and the influence of the Portugueſe long ago declined. In 1783 it was taken by ſtorm by the Britiſh troops, commanded by Gen. Matthews, and in 1799 it was ceded to Great Britain; 46 miles N.W. of Bednore and 15 from Pigeon iſland, which is in N. lat. 14° 1′. E. long. 74° 6′ 30″.

ONOS, in *Ichthyology*, a name given by ſome authors to the *æglefinus*, or common haddock. See GADUS *Æglefinus*.

ONOS is uſed by Athenæus, and many other of the Greek writers, for the fiſh which we call the *hake*, the *aſellus minor* of authors, called by Bellonius, Gefner, and ſome others, the *merluccius*. See GADUS *Merluccius*.

ONOSANDER, in *Biography*, was a Greek author and Platonic philoſopher; concerning the period in which he lived nothing certain can be aſcertained, except that he flouriſhed under the Roman emperors. He wrote commentaries upon the "Politics" of Plato, which have not come down to us. He was likewiſe author of a work of much celebrity, entitled "Στρατηγικος Λογος," being a treatiſe on the duties and virtues of a general of an army. This treatiſe was firſt publiſhed in a Latin verſion by Nicholas Saguntin, at Baſil in 1541. A new verſion of it was made by Joachim Camerarius, and publiſhed by his ſons at Nuremberg in the year 1595. In 1601 M. Rigault publiſhed an edition of it at Paris, in Greek and Latin, with notes, and ſince that time various editions and tranſlations of it have appeared. Moreri.

ONOSERIS, in *Botany*, ſo called by Willdenow, from ονος, *an aſs*, and σερις, *ſuccory*, apparently to preſerve ſome analogy with *Hyoſeris*, *Arnoſeris*, &c.; for there is no ſort of meaning in the particular application of the name to the plants in queſtion, of which he has framed a genus out of the Linnæan *Atractylis*.—Willd. Sp. Pl. v. 3. 1702.—Claſs and order, *Syngeneſia Polygamia-æqualis*. Nat. Ord. *Compoſitæ diſcoideæ*, Linn. *Corymbiferæ*, Juſſ.

Eſſ. Ch. Receptacle nearly naked. Down of ſimple hairs. Calyx imbricated. Corolla radiated; the florets of the radius three-toothed.

1. O. *purpurata*. Willd. n. 1. (Atractylis purpurata; Sm. Plant. Ic. t. 65. A. purpurea; Linn. Suppl. 349.)—

Leaves

Leaves lyrate, toothed; their terminal lobe haſtate.—Gathered by the celebrated Mutis in New Granada. Whether this plant be cauleſcent or not is uncertain, but the ſpecimen deſcribed ſeems to be the top of a woolly *branch*, crowned with ſeveral *leaves* and a branched *flower-ſtalk*. The *leaves* are a ſpan long, acute, ſharply toothed; their terminal lobe half their whole length. Their upper ſide is naked and peculiarly ſmooth; the under denſely woolly and ſnow-white. *Flower-ſtalk* longer than the leaves, clothed above with awl-ſhaped ſcales, reſembling thoſe of the calyx. *Flowers* purple, reſembling an *Aſter*, and near two inches wide when expanded. Their radiant *florets* are remarkable for a capillary ſpiral appendage, like an upper or inner lip.

2. O. *mexicana*. Willd. n. 2. (Atractylis mexicana; Linn. Suppl. 350. Sm. Plant. Ic. t. 66.)—Leaves lanceolate, entire.—Sent from the ſame country, by the ſame great botaniſt, to Linnæus. The *ſtem* ſeems ſhrubby, with long, ſimple, round, woolly, leafy branches. *Leaves* alternate, on ſhort woolly ſtalks, lanceolate, acute, entire, three inches long, ſingle-ribbed; ſmooth and ſhining above; white and woolly beneath, with glandular dots among the wool. *Flower* ſolitary, terminal, much like the laſt in ſtructure and colour, but rather ſmaller, and its radiant florets are deſtitute of the ſpiral lip.

Doubting the propriety of eſtabliſhing this genus, we have abſtained from giving its full natural character. See Atractylis.

ONOSMA, the name of a plant mentioned by Dioſcorides and Galen, derived, as it ſeems, from οσμη, *a ſweet ſmell*, or *ſavour*. Linnæus has arbitrarily applied it to the preſent genus.—Linn. Gen. 76. Schreb. 102. Willd. Sp. Pl. v. 1. 773. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 295. Juſſ. 130. Lamarck Dict. v. 4. 582. Illuſtr. t. 93. Gærtn. t. 67.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Aſperifoliæ*, Linn. *Borragineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, in five lanceolate, erect, permanent ſegments. *Cor.* of one petal, bell-ſhaped; tube very ſhort; limb tubular and ſwelling, rather thicker than the tube; its border generally five-cleft; throat naked, pervious. *Stam.* Filaments five, awl-ſhaped, very ſhort; anthers arrow-ſhaped, erect, the length of the corolla. *Piſt.* Germen ſuperior, four-cleft; ſtyle thread-ſhaped, the length of the corolla; ſtigma obtuſe. *Peric.* none, except the unchanged calyx. *Seeds* four, ovate.

Eſſ. Ch. Corolla bell-ſhaped, with a pervious throat. Seeds four. Style the length of the corolla.

1. O. *ſimpliciſſima*. Siberian Simple Onoſma. Linn. Sp. Pl. 196. Gmel. Sibir. v. 4. 76. t. 40.—Leaves much crowded, linear-lanceolate, hairy. Fruit erect.—Native of Siberia, and on calcareous rocks by the Wolga. It flowers from April to June. *Stems* about a ſpan high, ſimple, woody, occaſionally with one or two branches at their baſe. *Leaves* greatly crowded together, ſo as to be almoſt imbricated, very narrow and attenuated at the baſe. *Flowers* terminal, white, generally in two cluſters, at the ends of the ſtems, ſcarcely ſtalked. The wild plant is never more than a foot high, and is ſoft to the touch.

2. O. *taurica*. Golden-flowered Onoſma. Pallas Tableau de la Tauride, 47. Annals of Bot. v. 2. 411. Sims in Curt. Mag. t. 889.—Stems ſimple, riſing from a ſpreading baſe. Leaves linear-lanceolate, with white hairs on both ſides. Fruit erect. Frequent in the open hills of Tauria, as well as on the mountains of the Caſpian Caucaſus, flowering in May and June. *Root* perennial. *Stem* upright, round, waved, hairy. *Leaves* ſolitary, alternate, fringed with hairs. *Flowers* in large, handſome, terminal, drooping cluſters, of a rich yellow, or golden colour,

3. O. *orientalis*. Oriental Onoſma. Linn. Sp. Pl. 196. Willd n. 2. (Cerinthe orientalis; Amoen. Acad. v. 4. 267.)—Corolla cylindrical, acute. Leaves linear, hairy. Fruit pendulous.—Native of the Levant. It flowers in May and June. *Stems* round, hiſpid. *Leaves* alternate, ſeſſile, entire, hiſpid, with green or whitiſh hairs. *Flowers* on ſtalks, yellow, in a terminal double cluſter.

4. O. *echioides*. Hairy Onoſma. Linn. Sp. Pl. 196. Jacq. Auſtr. v. 3. 52. t. 295.—Corolla cylindrical, obtuſe. Leaves lanceolate, hiſpid. Fruit erect.—Native of the ſouth of Europe, flowering from March to June. *Root* perennial, long, ſimple, with a red bark. *Stem* generally a foot and half or two feet in height, much branched in the upper part, covered with pellucid, erect hairs or briſtles, each of which ſprings from a callous point. *Leaves* hairy; the lower ones attenuated towards the baſe; upper ſeſſile, ſomewhat heart-ſhaped at the baſe. *Flowers* yellow, in cluſters at the ends of the branches, reſembling the flowers of a *Symphytum*. The whole herb is very hairy.

Linnæus mentions a variety (β) of this ſpecies, and quotes it as figured in Column. Ecphr. t. 183. Dr. Smith however conſiders the plant of Columna as a diſtinct ſpecies. See his Tour on the Continent, ed. 2. v. 2. 325.

5. O. *tinctoria*. Deep-coloured Onoſma. Annals of Bot. v. 2. 410. (Cerinthe echioides; Scop. Carn. ed. 2. n. 197.)—Stem branched in the upper part. Leaves lanceolate-linear, hiſpid, green on both ſides. Fruit erect. Corolla longer than the calyx.—Native of paſtures in Tauria, flowering in the ſpring. This new ſpecies of *Onoſma* is greatly akin to the laſt, but differs in ſize, being of a more humble and ſimple habit. *Root* perennial, its bark ſtaining of a blood colour. *Leaves* ſomewhat narrower than in the laſt. *Flowers* ſmaller, pale, of a lemon-colour when old.

6. O. *ſericea*. Silky-leaved Onoſma. Willd. n. 4. Ait. Hort. Kew. ed. 2. v. 1. 296.—Leaves ſtalked, oblong-lanceolate, covered with ſilky hairs.—Native of the Levant. *Stem* quite ſimple, a ſpan high, white with down. *Leaves* oblong, acute, attenuated at the baſe and tip, thickly clothed on both ſides with hairs. *Corolla* dilated at the upper part.

7. O. *cærulea*. Willd. n. 5. (Symphytum orientale anguſtifolium flore cæruleo; Tourn. Cor. 7.)—Leaves ſeſſile, lanceolate, hairy and ſoft. Stamens longer than the corolla.—Native of Armenia. *Stem* a foot high, ſimple, white with down. *Radical-leaves* ſtalked; thoſe of the ſtem ſeſſile, ciliated at the margin. *Corolla* cylindrical, blue, dilated above.

Willdenow remarks that this is nearly allied to *Anchuſa lanata*, but that its leaves are not ſo woolly, nor is it furniſhed with a nectary.

8. O. *tenuiflora*. Slender Onoſma. Willd. n. 6. (Symphytum orientale echii folio, flore albo tenuiſſimo; Tourn. Cor. 6.)—Leaves ſeſſile, linear, obtuſe, hairy. Corolla cylindrical, a little longer than the linear calyx-leaves.—Native of the Levant. Diſtinct from every other ſpecies in the ſmallneſs of its *leaves*, which are linear, obtuſe, hiſpid, and ſcarcely the third of an inch in length.

9. O. *caſpica*. Caſpian Onoſma. Willd. n. 7. (O. orientalis; Pallas. It. v. 2. t. L.)—Stem branched, divaricated. Leaves oblongo-lanceolate, hiſpid. Flower-ſtalks axillary, when bearing the fruit reflexed. Corolla obtuſe.—Found in a ſandy ſoil on the borders of the Caſpian ſea. Willdenow ſays this is perfectly diſtinct from *orientalis*, in having a branched, diffuſe *ſtem*, its *flowers* axillary, and ſmaller.

10. O. *micrantha*. Small-flowered Onoſma. Willd. n. 8. (O. micranthos; Pallas. It. v. 2. app. n. 100. t. L.)—Stem branched, divaricated. Leaves ſtalked, oblong, white with hairs beneath. Cluſters naked. Native of ſandy places in Siberia.

Siberia. Willdenow tells us this may be eaſily known from all the other ſpecies by its *leaves* having very long ſtalks; its *cluſters* being terminal and compound, without any bracteas; and its *calyx* equal in length to the *corolla*.

ONOSMODIUM, ſo called by Michaux, as having a likeneſs to *Onoſma*, from which, according to that author, it differs in having a much ſhorter corolla, whoſe limb is acutely and more deeply divided, as well as leſs ſpreading, and the anthers ſeſſile, as well as leſs pointed. Michaux Boreali-Amer. v. 1. 132.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Aſperifoliæ*, Linn. *Borragineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, in five deep, narrow, linear, erect, permanent ſegments. *Cor.* of one petal, oblong, ſomewhat bell-ſhaped; tube very ſhort; limb ſwelling, cloven half way down into five, half-lanceolate, acute, erect and approximated ſegments, whoſe margin is inflexed; throat naked, pervious. *Stam.* Filaments wanting; anthers five, ſeſſile, included, arrow-ſhaped, acute. *Piſt.* Germen ſuperior, four-cleft; ſtyle thread-ſhaped, much longer than the corolla; ſtigma ſimple. *Peric.* none, except the unchanged calyx. *Seeds* four, ovate.

Eſſ. Ch. Corolla ſomewhat bell-ſhaped, with a pervious throat; limb erect. Anthers ſeſſile. Seeds four. Style much longer than the corolla.

Michaux defines two ſpecies, which are herbaceous plants, with longitudinal ribs to their leaves.

1. O. *hiſpidum*. (Lithoſpermum virginianum; Linn. Sp. Pl. 190. L. latifolium virginianum, flore albido longiore; Moriſ. ſect. 11. t. 28. f. 3.)—Hiſpid. Segments of the corolla awl-ſhaped, very acute.—Native of Virginia. A hardy perennial in our gardens, flowering in June, but of no beauty to obtain general cultivation. Every part is clothed with rigid briſtles. *Leaves* lanceolate, or inverſely ovate, acute; clothed on the upper ſide with tubercles bearing hairs. *Corolla* whitiſh, about twice as long as the calyx.

2. O. *molle*. Mich. t. 15.—Downy. Segments of the corolla ſomewhat ovate.—Found in the country of Tennaſſée about Naſhville. *Mich.* This appears to have much reſemblance to the former, but the whole *herb* is hoary with ſoft whitiſh hairs. *Leaves* oblong-oval, with a central rib, and two pair of lateral ones, ſpringing more or leſs from its baſe. *Corolla* like the laſt, but with broader ſegments.

ONOVA, in *Geography*, a town of Hungary; 4 miles N. of Pancſova.

ONREAGH, a river of the county of Tyrone, Ireland, which riſes on the borders of Fermanagh, and flowing eaſtward, joins its waters to the Cameron.

ONRUST, a ſmall iſland near the coaſt of Java. This iſland lies about three leagues N.W. from Batavia. It is nearly round, riſing ſix or eight feet above the ſurface of the water, and of ſmall extent, being about 4800 feet in circumference. In the centre of the iſland, and within a fort, conſiſting of four baſtions and three curtains, ſtand the warehouſes and other buildings. On theſe fortifications, and on three ſmall outworks, conſtructed at the water's edge, are mounted 40 pieces of cannon of various ſizes. This fortified iſland is well ſituated to command the channel that affords the principal paſſage into the road. Whilſt this iſland was in poſſeſſion of the Dutch, the company had ten or twelve large warehouſes, almoſt always full of goods, conſiſting of pepper, Japan copper, ſaltpetre, tin, caliatour wood, ſapan wood, &c. under the direction of two adminiſtrators. On the north ſide of the iſland are two ſaw-mills, and on the ſouth ſide there is a long pier-head, on which are three large wooden cranes, erected for fixing maſts in ſhips, or for unſtepping them. Three ſhips can lie here, behind each other, alongſide of the pier, in deep water, to be repaired, or to receive and diſcharge their cargoes. There is another pier, a little more to the weſtward, called the Japan pier, where one more ſhip can lie, to load or unload. "It would be injuſtice," ſays captain Cook, "to the officers and workmen of this yard, not to declare, that, in my opinion, there is not a marine-yard in the world, where a ſhip can be laid down with more convenience, ſafety, and diſpatch, nor repaired with more diligence and ſkill." Although this iſland is but ſmall, the number of inhabitants is ſuppoſed to be near 3000, among whom are 300 European workmen. About 1600 feet from Onruſt is the iſland "de Kuiper," or "Cooper's" iſle, one-third leſs in ſize than the former, upon which the Dutch company had ſeveral warehouſes, in which coffee was laid up; and here are two pier-heads for loading and diſcharging ſhips. The iſland abounds with large tamarind trees, which afford an agreeable ſhade. To the eaſtward of Onruſt, and at twice the diſtance of Cooper's iſle, is the iſland "Purmerend," which is half as large again as Onruſt; planted with ſhady trees, and accommodating the diſeaſed who are ſent hither from Batavia with an hoſpital or lazaretto. "Edam" is another iſland about three leagues N.N.E. from Batavia, and about half an hour's walk in circumference; very woody, and having abundance of large and ancient trees. One of them, which is the banian-tree, and ſo large that 20 men, with their arms extended, cannot encompaſs it, is eſteemed holy by the Javaneſe, and much venerated by them. Stavorinus's Voyages, vol. i.

ONS, a ſmall iſland in the Atlantic, near the coaſt of Spain. N. lat. 42° 23'. W. long. 8° 55'.

ONSALD, a town of Sweden, in the province of Halland; 4 miles S.S.W. of Kongſbach.

ONSLOW, a maritime county of America, in Wilmington diſtrict, North Carolina, weſt of Cape Lookout; containing 5474 inhabitants, including 1757 ſlaves. Its chief town is Swanſborough.—Alſo, a townſhip of Nova Scotia, in Halifax county, at the head of the baſin of Minas; 35 miles N.E. of Windſor; ſettled by emigrants from New England.

ONTARIO, one of the grand chain of lakes in North America, which divides the United States from Upper Canada; ſituated between 43° 15' and 44° N. lat., and 76° 30' and 80° W. long. It is of a nearly elliptic form, its greateſt length being from S.W. to N.E., and its circumference about 600 miles. The diviſion line between the ſtate of New York and Canada on the north paſſes through this lake, and leaves within the United States, according to Mr. Hutchins's calculations, 2,390,000 acres of the water of the lake. It abounds with excellent fiſh, particularly the Oſwego baſs, weighing three or four pounds. Its banks are in many places ſteep, and the ſouthern ſhore is covered principally with beech trees. The ſoil ſeems to be good. This lake communicates with lake Erie by the river Niagara: it receives the waters of Genneſſee river from the ſouth, and of Onondago at fort Oſwego, from the eaſt, by which it communicates, through Oneida lake and Wood creek, with the Mohawk river. On the north-eaſt it diſcharges itſelf into the river Cataraqui, which takes the name of St. Lawrence at Montreal, and by this river into the Atlantic ocean. Its iſlands are ſituated at the eaſtern end, and the chief of them are Wolf, Amherſt, Gage, and Howe iſlands.

ONTARIO, a large and fertile county of New York, bounded north by the above-deſcribed lake, weſt by the Genneſſee river, and ſouth by Steuben county. This county is well watered by the Genneſſee, and alſo by its tributary ſtreams, and a number of ſmall lakes. The chief

town is Canandarqua, ſituated at the north-weſt corner of Canandarqua lake, 15 miles W. of Geneva. The number of inhabitants is 12,584, of whom 57 are ſlaves.—Alſo, a county in Upper Canada, containing the following iſlands: *viz.* Tonti, called Amherſt iſland; Iſle au Forêt, called Gage iſland; Grand Iſle, called Wolfe iſland; and Iſle Couchois, called Howe iſland; and alſo all the iſlands between the mouth of the Garoqui to the eaſternmoſt extremity of the late townſhip of Maryſburg, called Point Pleaſant.

Ontario *Fort.* See Oswego.

ONTES, a town of France, in the department of Mont Blanc; 14 miles S. of Seyſſel.

ONTOLOGY, or Ontosophy, the doctrine or ſcience *de ente*, that is, of being, in the general, or abſtract, together with the various and moſt univerſal modes or affections, as well as the ſeveral kinds or diviſions of it; for an account of which we refer to Watts's "Brief Scheme of Ontology." See alſo in this Dictionary Being, Ens, Essence, and Existence.

Ontology coincides with what in the ſchools is more uſually called *metaphyſics*; which ſee: and more lately, philoſophy of the mind, or *Mental* Philosophy; which ſee.

ONTONG Java, in *Geography*, a group of 22 iſlands in the Pacific ocean, called by Mendana "Bazos de la Candelaria," but now denominated "New Ireland." S. lat. 6° 15′. E. long. 156°.

ONTORIA, a town of Spain, in Aſturias, near the ſea; 45 miles E.N.E. of Oviedo.

ONUM, a town of Sweden, in Weſt Gothland; 36 miles E. of Uddevalla.

ONUPHIS, in *Ancient Geography*, a town of Egypt, and capital of a nome, called "Onuphites nomos," ſituated about the middle of the Delta, on the right bank of the canal called "Athribiticus Sinus," between Sebennytus and Butus.

ONYCHIA, in *Surgery*, from ονυξ, *a nail*, an abſceſs near the finger-nail, a whitlow.

ONYCOMANCY, or, as ſome write it, Onymancy, derived from ονυξ, *nail*, and μαντεια, *divination*, a kind of divination, by means of the nails of the fingers.

The ancient practice was to rub the nails of a youth with oil and ſoot, or wax, and to hold up the nails, thus ſmeared, againſt the ſun. Upon them were ſuppoſed to appear figures or characters, which ſhewed the thing required.

Hence, alſo, modern chiromancers call that branch of their art which relates to the inſpection of the nails, onycomancy.

ONYE, in *Geography*, a town of Hindooſtan, in Guzerat; 40 miles S.E. of Surat.

ONYX. The Greeks applied this term to a ſmall abſceſs of the eye, when it was ſhaped like the finger-nail.

Onyx, in *Natural Hiſtory*, the name originally given to the chalcedony with opaque ſtripes, of a pure white colour; and in later times applied to many agates, &c. with differently coloured ſtripes or zones. See the articles Agate, Chalcedony, and Gems.

Onyx, in *Conchology*, the name given by the curious to a ſpecies of voluta, found in cabinets, but never met with in that ſtate on the ſea-ſhores. The true account of this is, that the ſhell in this elegant form owes its appearance to art, having been poliſhed, and having had its outer coat taken off. With this outer coat, which is of a duſky yellow, it is often kept in the ſame cabinet under another name, being then called by the French, the cierge or wax ſhell.

Onyx, *Cypræa.* See Cypræa.

Onyx, in *Zoology*, a name by which Pliny and many other of the ancient writers have called the ſolen.

Onyx *Indicus*, in the *Materia Medica of the Ancients*, a term uſed by the Greek writers to expreſs what is uſually called *unguis odoratus*, or the ſweet hoof. Some call it *onychus indicus*, as particularly Myrepſus, in his antidote of fifty ſpecies. The ſame author mentions the blatta byzantia, and tells us that it is not the ſame thing with the onyx indicus, but that the Italians called by this name the os naſi, or bone of the noſe, of the purple fiſh. What he means by this is probably the bony tongue of that animal, nature having given it ſuch a weapon to pierce the ſhells of thoſe fiſh on which it is to feed. We frequently find the chamæ, and other ſhell-fiſh, with holes bored through the upper ſhell as exact as if it were done with an inſtrument: this has been done by the purple fiſh, to get at the fleſh of the animal within for food; and the bony tongue, with which this fiſh performs this, is called, by the Italians of thoſe times, blatta byzantia. Actuarius tranſlates the blatta byzantia of all the earlier writers by the phraſe os naſi purpuræ; and the interpreters of the Arabian writers give the ſame name to what they call unguis odoratus, or onyx indicus, for the Arabian name exactly expreſſes this.

ONZA, in *Geography*, a river of Africa, in the kingdom of Congo, which runs into the Atlantic, having a harbour at its mouth, but too ſhallow for navigation. It diſcharges itſelf at Moſſala, 140 miles S. from the Zaire, S. lat. 8° 10′.

ONZAN, a cape or point on the north coaſt of Braſil, oppoſite to cape St. Lawrence, forming jointly the points of Laguariba river; the former being on the weſt ſide of the river, which river is 10 leagues S.E. by E. of Bohia Baxa.

ONZATE, a town of Italy, in the department of the Mela; 5 miles S.S.W. of Breſcia.

ONZELLA, a river of Spain, which runs into the Aragon, at Sangueſa.

OOBA, a town of Japan, in the iſland of Niphon; 45 miles W. of Meaco.

OOBEEAN, a ſmall iſland in the Sooloo archipelago. N. lat. 66°. E. long. 120° 22′.

OOCHISRAVA, in *Hindoo Mythology*, is the name of a many-headed horſe, that, in the fabulous legends of India, aroſe from the ocean, when churned by gods and demons, as deſcribed under the article Kurmavatara of this work. The reſult of this operation was the obtaining fourteen precious things, or gems, as enumerated in the article juſt referred to: among them the horſe, the ſubject of this. That, in the infancy of ſociety, the diſcovery of the value of this noble animal, and of the mode of applying his ſtrength and docility to the uſes of man, ſhould be the object of recorded gratitude, is ſufficiently reaſonable; but whether this be the intention of the fable in queſtion, we cannot decide. In pictures of the Kurmavatara, the horſe is uſually repreſented white, and properly ſhaped and proportioned, except in the additional heads, ſeven of which project from the front of the firſt. This item of the popular fable of churning the ocean is ſeldom mentioned in the writings of the Hindoos, excepting in deſcriptions of that operation. The white eight-headed horſe is ſometimes noticed as in the ſuite or poſſeſſion of Indra, the regent of the firmament. Some legends deſcribe this horſe as *ſeven*-headed: he then will appertain immediately to the ſun. See Surya.

OOD, in *Geography*, a town of Sweden, in Weſt Gothland; 41 miles N.E. of Gotheborg.

OODA, a town of Japan, in the iſland of Niphon; 30 miles N.W. of Namba.—Alſo, a town of Japan, in the iſland of Ximo; 10 miles S.W. of Senga.

OODAPOUR, a town of Bengal; 16 miles E. of Comillah.

OODEADARGAM, a town of Hindooſtan, in Myſore, which gives name to a paſs taken by the Britiſh troops in 1800; 31 miles S.E. of Bangalore.

OODIMALLYCOTTA, a town of Hindooſtan, in Coimbetore; 17 miles E.S.E. of Animally.

OODNAGUR, a town of Bengal; 22 miles N. of Kiſhenagur.

OOFARA, a town of Japan, in the iſland of Niphon; 120 miles W. of Meaco.

OOGEIN, or OOJEIN. See OUGEIN.

OOISCONSIN, in *Geography*, a river of North America, which runs into the Miſſiſippi; N. lat. 42° 32'. W. long. 92° 3'.

OOKATA, a town of Japan, in the iſland of Ximo; 28 miles S. of Funai.

OOKI, a town of Japan, in the iſland of Ximo; 54 miles N. of Nangaſaki.

OOLANDOOR, a town of Hindooſtan, in the Carnatic; 20 miles W.S.W. of Trivadi.

OOLPAR, a town of Hindooſtan, in Guzerat; 10 miles W. of Surat.

OOMKOO, a mountain of Aſia, between Bootan and Bengal, N. of Buxadewar. It is higher than the Peachukom mountain, covered to its ſummit with trees, all clothed with moſs, and with creepers intertwined among them, of ſurpriſing length and thickneſs, and not leſs remarkable for their flexibility and ſtrength; qualities which render them an excellent ſubſtitute for rope, the uſe of which they entirely ſuperſede. This mountain is compoſed in ſome places of clay; but for the moſt part it conſiſts of a flinty ſtone, ſtriated with talc and intermixed with marble. It produces a great quantity of bamboo, which is very hollow, and ſmaller than that of Bengal, having its ſhoots at a greater diſtance from each other, and growing to full maturity in one ſeaſon. Its leaves are very large, and are gathered as food for their horſes inſtead of graſs: cluſters of plaintain trees were not uncommon. On one declivity of this hill is a ſacred ſpot called "Sheenſhilla," dedicated to a deity of the ſame name. Turner's Tibet, p. 45.

OONALASHKA, UNALASHKA, or *Agun-Alaſhka*, an iſland in the North Pacific ocean, ſeparated from the continent of North America by a channel in the direction of N.W. by N. This is one of the "Fox iſlands," and ſuppoſed to be the largeſt of them, and to contain ſeveral thouſand inhabitants. (See FOX *Iſlands*.) The houſes of theſe iſlanders are tents, like thoſe in Kamtſchatka, with an entrance by a hole in the middle of the roof. In one of theſe ſeveral families reſide, including thirty or forty perſons: they keep themſelves warm by means of whale fat, burnt in ſhells and placed between their legs: the women ſit apart from the men; and ſix or ſeven of theſe tents, called "Yourts," compoſe a village, of which there are ſixteen in Oonalaſhka. As their habitations are dark, they perpetually uſe, in winter, a ſort of large lamp, hollowed in a ſtone, into which they put a ruſh-wick, and burn train oil. The inhabitants are white, with black hair, having flat faces and being of good ſtature: the men ſhave with a ſharp ſtone or knife the circumference and top of the head, and the remaining hair is left to hang from the crown. The women cut their hair in a ſtraight line over the forehead, tying it behind, when it is of conſiderable length, in a bunch. Some of the men wear their beards, and others ſhave or pull them out by the roots. They mark their faces, the backs of their hands, and lower parts of their arms, with various figures, by pricking them firſt with a kind of needle, and afterwards rubbing the parts with black clay. In the lower lip they make three inciſions; placing in the middle one a flat bone, or coloured ſtone; and in each of the ſide ſlits they fix a long pointed piece of bone, which bends and reaches almoſt to the ears. They likewiſe make a hole through the griſtle of the noſe, into which they put a ſmall piece of bone, ſo as to keep the noſtrils extended. They alſo pierce holes in their ears, and wear in them any ſmall ornaments which they can procure. Their dreſs conſiſts of a cap and fur-coat, which extends down to the knee. Some wear caps of a party-coloured bird-ſkin, upon which is left part of the wings and tail. On the forepart of their hunting and fiſhing caps, they place a ſmall board like a ſcreen, adorned with the jaw-bones of ſea-bears, and ornamented with glaſs beads, which they procure in barter from the Ruſſians. At their feſtivals and dancing parties, they uſe a more ſhowy ſort of cap. Their coats are made and worn like ſhirts. The dreſs of the men is made of bird-ſkins, that of the women of ſea-otters and ſea-bears, neatly ſewed with ſinews, and ornamented with ſtripes of ſea-otter ſkins and leather fringes. They have alſo upper garments made of the inteſtines of the largeſt ſea-calves and ſea-lions. Their veſſels are of two ſorts: the larger being leather boats, or "baidars," with oars on both ſides, and capable of holding thirty or forty people: the ſmaller veſſels are rowed with a double paddle, and contain one or two perſons: they are a mere ſkeleton of a boat covered with leather, and yet they paſs in them from one iſland to another, and venture out to ſea to a conſiderable diſtance. In calm weather they go out to catch turbot and cod with hooks, and lines made with ſinews or feathers. Unſupplied by the fiſh and game they take with ſufficient ſuſtenance, their food conſiſts of ſea-wrack and ſhell-fiſh, which they find on ſhore. They generally eat the fleſh of all ſea-animals raw; and if they dreſs it they place it between two ſtones, ſtopping the interſtices with lime or clay, and kindle a fire under it. Their proviſions they keep undried without ſalt in the open air. They gather berries of various ſorts, and the root of the ſacanas, which grows wild at Kamtſchatka. They have not learnt the art of diſtilling brandy or any other ſtrong liquors from the cow-parſnip; they are fond of ſnuff, with which the Ruſſians ſupply them. Marriage ceremonies are unknown, but each man takes as many wives as he can maintain, generally four. Their weapons conſiſt of bows, arrows, and darts; for defence they uſe wooden ſhields, called "kayaki." Although ſavages, theſe iſlanders are very docile. The Ruſſians have for ſome years repaired to theſe iſlands for furs, of which they have impoſed a tax on the inhabitants. Beſides this tax they demand, in return for the fox-traps and ſkins with which they ſupply them, furs and proviſions for the winter; for the reſt they pay in beads, falſe pearls, goats' wool, copper kettles, halibets, &c. Capt. Cook and Capt. King viſited this iſland in the year 1778: the inhabitants ſeldom came to the ſhips, and did not remain above a quarter of an hour at a time, bartering a few articles with the ſeamen, but appearing to avoid much intercourſe. They are ſaid to have behaved with a degree of politeneſs uncommon with ſavage tribes. Several of the natives bartered a few fiſhing implements for tobacco. The ſhips excited their curioſity, though they did not appear to be altogether ſtrangers to Europeans: ſuch of them as could not come off in canoes, aſſembled on the hills to look at them. They were obſerved to eat raw fiſh. N. lat. 53° 45' to 54°. E. long. 191° 20' to 192°.

OONATO a town of Japan, in the iſland of Niphon; 120 miles N. of Jedo.

OONDAPATTY, a town of Bengal, in Baglana; 15 miles S. of Noaſſuch.

OONELLA, one of the Fox iſlands, about 7 leagues in cirumference, near the mouth of Samganoodha harbour in Oonalaſhka. The iſland of Acootan, E.N.E. of it, is conſiderably larger, and has ſeveral high mountains. See ACOOTAN.

OONEMAK, OONIMAK, or *Unimak*, one of the Fox iſlands, between Oonalaſhka and Alaſhka, about 200 miles in circumference. N. lat. 54° 30′ to 55° 15′. E. long. 194° 30′ to 196° 40′.

OONEMAK, *Cape*. See ONEMACK *Point*.

OONGONDA, a town of Hindooſtan, in Golconda; 35 miles S. of Combamet.

OONIARA, a large town of Hindooſtan, on the route from Agra to Oujein, ſurrounded by a wall partly of mud, partly of ſtone. Within the ſtone incloſure is a handſome houſe of the rajah: around both walls runs a ditch. The rajah is a feudatory of the rajah of Jynagur, to whom a tribute is paid of 35,000 rupees to the Siccar, and 5000 to the officers of government.

OONO, a town of Japan, in the iſland of Ximo; 25 miles W. of Funai.

OOOA, one of the ſmall Friendly iſlands; 12 miles N.E. of Annamooka.

OOREY, a town of Hindooſtan, in the circar of Gohud; 20 miles S.S.W. of Calpy.

OORGAUM, a town of Hindooſtan, in Dowlatabad; 15 miles E.N.E. of Amednagur.

OORITCHYCOTTAMALLY, a town of Hindooſtan, in Baramaul; 12 miles W. of Sankeridurgam.

OOROO, a kind of cloth made by the people of Otaheite, and of other iſlands in that neighbourhood, from the bark of the bread-fruit tree: the proceſs of its manufacture has been explained under the word AOUTA, which is a name given in thoſe countries to another kind of cloth, made of the bark of the paper-mulberry tree, preciſely after the ſame manner.

OORT, ADAM VAN, in *Biography*, was a painter of the Flemiſh ſchool, who enjoyed conſiderable reputation, but is made moſt remarkable by having had the honour of initiating the uncommon genius of Rubens in the art he practiſed.

He was born at Antwerp in 1557, and was the ſon of Lambert Van Oort, a painter of perſpective and architecture. Adam ſoon left his father's humble walk, and attempted hiſtory and portrait painting with ſucceſs; but he neglected the ſimplicity of nature, and having genius ſufficient to invent a ſyſtem of his own, too cloſely followed it to the loſs of juſt feeling and propriety.

It was not only in his painting that he was a manneriſt, but alſo in his diſpoſition; by the rough and unamiable humour of which, he loſt his friends and lived unhappily. Jordaens, who married his daughter, and who probably by his affection for her was induced to tolerate the rudeneſs of Van Oort's manners, was the only one of his numerous pupils who did not deſert him: yet he lived to the great age of 84, dying in 1557.

OOSCOPIA, ωοσκοπια, in *Antiquity*, a ſpecies of divination, wherein predictions were made from eggs.

OOSI, in *Geography*, a town of Japan, in the iſland of Niphon; 24 miles N.N.W. of Moriſa.

OOSIMA, a ſmall iſland of Japan, near the S. coaſt of Niphon. N. lat. 34° 26′. E. long. 139° 25′.

OOST, JACOB VAN, in *Biography*, a Flemiſh painter, born at Bruges about 1600, who travelled to Italy, and ſtudying with great attention the works of Annibal Carracci, ſucceeded in imitating his ſtyle of deſign in ſuch a manner as frequently to deceive. He died in 1671.

OOST, *Oaſt*, or *Ouſt*, in *Huſbandry*, a name given by the people who manure hops, to the kiln in which they dry them, after they are picked from the ſtalks. This is a ſquare room, built up of brick or ſtone, ten feet wide, more or leſs, and having a door on one ſide. In the midſt of this room is a fire-place, about thirteen inches wide, and as much high, and, in length, reaching from the mouth ſo nearly to the back part of the kiln, that a man has juſt room to go round it. This fire-place is called a *herſe*, and the fire is let out into the room by ſeveral holes in the ſides, in the ſame manner as in malt-kilns. Five feet above this is laid the floor, on which the hops are to be laid to dry; and this muſt have a wall round it of four feet high, to keep the hops from falling out. At one ſide of the upper bed muſt be made a window by which to puſh out the hops, as they are dried, into the room prepared for them. The beds muſt be made of laths an inch ſquare, placed at a quarter of an inch diſtance from one another, and ſupported by beams underneath. The hops are to be poured on this bed with a baſket, till the whole is covered half a yard thick with them; when this is done, lay them even with a rake, and let a fire be made in the fire-place below. Some recommend a wood fire, but experience ſhews, that nothing does ſo well as charcoal; let the fire be kept at the mouth of the furnace, for the air will be carried all the way through; and thus let the hops lie, never ſtirring them till they are thoroughly dry; when they rattle under the rake, and the inner ſtalks are brittle, they are ſufficiently dried, and are to be puſhed out, and a freſh parcel laid in the ooſt in their place.

The kilns for drying hops are built with fire-places, in the nature of malt-kilns; and at a proper diſtance over the fire is an hair-cloth ſtrained upon laths; and thereon the hops are laid and raked even, to the depth of about ſix or ſeven inches, for the better conveniency of drying them equally; and when they are properly cured on the under ſide, they are carefully turned; and by that means the upper ſide becoming the under, the whole ſhares the fire alike. The perſon that performs this part is called the dryer, whoſe buſineſs it is to manage the fires. The fuel commonly made uſe of is charcoal, on account of its freeneſs from ſmoke, and affording a ſteady heat. Great nicety is required in this part; a ſmall fire being to be made at firſt, that they may heat gradually, and ſo raiſed as they dry, that it may be done without ſcorching; and the fire is to be lowered by degrees, againſt they are ready to be taken off: the time required is about eight hours. From charcoal being dear, many people have adopted the method of drying with ſea-coal, upon what they call cockle-ouſts, which are ſquare iron boxes placed upon brick-work, and a flue and chimney in the back part of the building for the ſmoke to go off. The computation is, that a chaldron of ſea-coal, at about twenty-four ſhillings, will dry a load of hops, and that a load of charcoal will do no more. It is indeed expenſive to erect ſuch ouſts, as there muſt be no timber near them; and an iron beam and iron laths are to be uſed, and they covered with plates of tin or iron properly faſtened together. See TIN-*floor*.

But a new method of drying hops with ſea-coal or any kind of fuel whatever, by means of a moveable iron furnace, has lately been invented: it is in the form of an horizontal cylinder, ſtopped at both ends: it lies on an iron carriage, which rolls on four iron wheels; in the fore end of the cylinder is the furnace door; and a hollow iron flue runs in an horizontal direction along the upper ſurface of the cylinder from the back, till it reaches the fore end of it, when it takes a vertical direction, and is carried as high as is neceſſary to convey the ſmoke out of the ouſt. It is a ſort of rolling furnace.

OOSTBOURG, in *Geography*, a town of France, in the department of the Scheldt, and chief place of a canton, in the diſtrict of L'Eclufe. The place contains 793, and the canton 4903 inhabitants, on a territory of 110 kiliometres, in ſeven communes.

OOSTERADE, a town of the duchy of Holſtein; ſeven miles E.N.E. of Itzchoa.

OOSTERDYKIA, in *Botany*. See CUNONIA.

OOSTERHOUT, in *Geography*, a town of Brabant; ſix miles N.E. of Breda.

OOSTERWYCK, a town of Brabant; ſeven miles S.W. of Bois le Duc.

OOSTERZEELE, a town of France, in the department of the Scheldt, and chief place of a canton, in the diſtrict of Ghent. The place contains 2740, and the canton 19,436 inhabitants, on a territory of 110 kiliometres, in 19 communes.

OOST-ROOSBECKE, a town of France, in the department of the Lys, and chief place of a canton, in the diſtrict of Courtray. The place contains 3540, and the canton 11,990 inhabitants, on a territory of 57½ kiliometres, in eight communes.

OOTAGAMIS, UPPER, a town of America, on the river Ooiſconſin, about 40 miles from the Miſſiſippi. N. lat. 42° 42'. W. long. 91° 8'. The *Lower Ootagamis* lies at the conflux of the two forementioned rivers.

OOTAMA SCHOLAPERAM, a town of Hindooſtan, in Myſore; nine miles S.E. of Wombinellore.

OOTAMALLY, a town of Hindooſtan, in Coimbetore; 30 miles S.S.E. of Coimbetore.

OOTATORE, a town of Hindooſtan, in the Carnatic; 22 miles N.W. of Tanjore. N. lat. 11° 2'. E. long. 78° 58'.

OOTAWAS. See OTTAWAS.

OOTERAWOODY, a town of Hindooſtan, in Coimbetore; ſeven miles N. of Daraporum.

OOTIAMPALIAM, a town of Hindooſtan, in the country of Dindigul; 50 miles S.S.W. of Dindigul.

OOTIAMPALIAM, *Valley of*, a territory of Hindooſtan, eneloſed between the branches of the Gauts, on the weſtern ſide of the peninſula, and extending 14 or 15 miles between the termination of the northern Gauts and the commencement of the ſouthern ones from Paniany to Coimbetore, before it opens finally into the low country on the Malabar coaſt. As it is well known, that ſhips which navigate this coaſt during the N.E. monſoon, commonly experience a ſtronger gale in the neighbourhood of Paniany than elſewhere, major Rennell is of opinion, that this opening in the Gauts is a very ſufficient cauſe for ſuch an effect; and as the lower part of the Coimbetore country partakes of the rainy or S.W. monſoon of the Malabar coaſt, this may be referred to the ſame cauſe.

OOTORI, a town of Japan, in the iſland of Niphon. N. lat. 34° 26'. E. long. 136° 40'.

OOTSOUR, a town of Hindooſtan, in Myſore; 30 miles E. of Rettinghery.

OPACITY, in *Philoſophy*, a quality of bodies which renders them opaque; that is, impervious to the rays of light.

The term *opacity* is uſed in oppoſition to *tranſparency*.

Opacity, according to the Carteſians, conſiſts in this; that the pores of the body are not all ſtraight, or directly before each other; or rather not pervious every way.

But this doctrine is deficient: for though it muſt be allowed, that, to have a body tranſparent, its pores muſt be ſtraight, or rather open every way; yet how it ſhould happen, that not only glaſs and diamonds, but even water, whoſe parts are ſo very moveable, ſhould have all their pores open and pervious every way; and, at the ſame time, the fineſt paper or the thinneſt gold plate ſhould exclude the light, for want of ſuch pores, is inconceivable. So that another cauſe of opacity muſt be found. Now all bodies have vaſtly more pores or vacuities than are neceſſary for an infinite number of rays to find a free paſſage through them in right lines, without ſtriking on any of the parts themſelves: for ſince water is nineteen times lighter, *i. e.* ſo much rarer than gold; and yet gold itſelf is ſo very rare, that magnetic effluvia paſs freely through it, without any oppoſition; and quickſilver is readily received within its pores, and even water itſelf by compreſſion; it muſt have much more pores than ſolid parts; conſequently, water muſt have at leaſt forty times as much vacuity as ſolidity.

The cauſe, therefore, why ſome bodies are opaque, does not conſiſt in the want of rectilinear pores, pervious every way; but either in the unequal denſity of the parts, or in the magnitude of pores, and their being either empty, or filled with a different matter; by means of which, the rays of light in their paſſage are arreſted by innumerable refractions and reflections, till, falling at length on ſome ſolid part, they become quite extinct, and are utterly abſorbed.

Hence cork, paper, wood, &c. are opaque; while glaſs, diamonds, &c. are pellucid. For in the confines or joining of parts alike in denſity, ſuch as thoſe of glaſs, water, diamonds, &c. among themſelves, there ariſes no refraction or reflection, by reaſon of the equal attraction every way; ſo that, ſuch of the rays of light as enter the firſt ſurface, paſs ſtraight through the body, excepting ſuch as are loſt and abſorbed, by ſtriking on ſolid parts; but in the bordering of parts unequal in denſity, ſuch as thoſe of wood and paper, both with regard to themſelves, and with regard to the air or empty ſpace in their larger pores, the attraction being unequal, the reflections and refractions will be very great: thus the rays will be unable to paſs through ſuch bodies, being continually driven about, till they become extinct.

That this interruption or diſcontinuity of parts is the chief cauſe of opacity, ſir Iſaac Newton argues, does appear hence; that all opaque bodies immediately begin to be tranſparent, when their pores become filled with a ſubſtance of equal, or almoſt equal, denſity with their parts. Thus paper dipped in water or oil, the ſtone called *oculus mundi* ſteeped in water, linen-cloth dipped in oil or vinegar, and other ſubſtances ſoaked in ſuch fluids as will intimately pervade their little pores, become more tranſparent than before.

On the contrary, the moſt tranſparent ſubſtances, by emptying their pores, or ſeparating their parts, may be rendered very opaque. Thus ſalts, or wet paper, or oculus mundi, by drying; horn, by ſcraping; glaſs, by pulveriſing, or flawing; and water itſelf, by being beat into bubbles or froth; are rendered opaque.

Indeed, to render bodies opaque, and coloured, their interſtices muſt not be leſs than of ſome determinate ſize; for the moſt opaque bodies that are, if their parts be very minutely divided, as when metals are divided in acid menſtruums, become perfectly tranſparent. See TRANSPARENCY.

OPAH, or KING-FISH, in *Ichthyology*, a ſpecies of fiſh common on the coaſt of Guinea; it is ſmooth-ſkinned, without ſcales or teeth; it has one erect fin to its back, which riſes below its neck, and reaches almoſt to its tail; there is alſo on each ſide, behind the gills, a fin; and a pair of fins a little before the vent under its belly; from behind the vent runs one fin within a little of the tail; and the tail-fin is large

large and forked; the eyes of this fiſh are large, the irides ſcarlet, encompaſſed with a circle of a gold colour, verged with ſcarlet; its noſtrils are placed above its eyes; the upper part of the body is of a dark blue, or violet colour; this, and the ſides which are of a bright green, are ſpeckled with oblong white ſpots; the chaps of a pale red; the noſe, gills, and belly of a ſilver colour; and all the fins of a bright ſcarlet; the mouth is ſmall, the tongue thick, and reſembling a human tongue, but thick-ſet with prickles, which are pointed backwards, and which ſeem to ſerve inſtead of teeth for retaining its prey or food. The fiſh from which this deſcription is taken, was three feet ſeven inches long, and three feet ten inches round in the thickeſt part, and weighed eighty-two pounds; the fleſh of the fore-part was firm, and had the appearance of beef, and the hinder part like fine veal. Phil. Tranſ. vol. xlvi. p. 518. or Abr. vol. xi. p. 879.

OPAL, Opalus, in *Natural Hiſtory*, a precious ſtone, of various colours; changeable according to the different poſition of the ſtone to the light.

It is generally claſſed among the ſiliceous earths, or finer flints, although ſome ſpecimens are ſo ſoft as to be capable of being ſcratched with a knife. M. Chaptal conſiders the opal as a ſemi-tranſparent agate of a milky whiteneſs, exhibiting a glittering, changeable, internal colour, of a blue, red, and green tinge. That which comes from Hungary has a kind of greyiſh clay for its gangre. The moſt beautiful opal is the oriental; ſometimes called the ſpangled opal, becauſe its colour appears like equal ſpots diſtributed over its whole ſurface. Theſe opals have received various names, according to the colours they reflect. The chatoyant ſtones, or ſuch as vary their colour according to the poſition of the light, and the eye of the obſerver, are varieties of the opal; ſuch are the giraſol, cat's-eye, and fiſh's-eye. The reflected rays of the giraſol are weak, blueiſh, and mixed with an orange yellow. This ſtone has been found in the lead mines of Chatelaudren in Britanny. The moſt obvious character of the giraſol is, that it exhibits in its internal part a luminous point; and reflects the rays of light in whatever poſition it may be turned, when it is cut into a globe or hemiſphere. The fiſh's-eye does not differ from the *Cat's-eye* (which ſee,) except in its colour, which is blueiſh: it is found at Java. See Gems.

Of opal there are four ſub-ſpecies, *viz.* the noble opal, infuſible before the blowpipe, ſp. grav. 2.114, and compoſed of 90 ſilex and 2 of water; common opal, infuſible without addition before the blowpipe, ſp. gr. 1.95 to 2.01, one ſpecimen compoſed of 98.75 ſilex, 0.1 alumine, 0.1 oxyd of iron, 0 water; and another conſiſting of 93.5 ſilex, 0 alumine, 1 oxyd of iron, and 5 water; ſemi-opal, infuſible in the furnace, ſp. gr. 2.54, compoſed in two ſpecimens of 43.5, or 35.5 ſilex, 0 or 1 alumine, 47. or 0.5 oxyd of iron, 0 or 0.5 lime, and 7.5 or 11.0 water; and wood opal, ſp. gr. 2.6, appearing to be wood penetrated with opal.

To imitate this gem in natural cryſtal uſe the following method: take yellow orpiment, and white arſenic, of each two ounces; crude antimony, and ſal ammoniac, of each one ounce: powder all theſe, and mix them well together; put this powder into a large crucible, and lay upon it ſmall fragments of cryſtal, and, upon theſe, other larger pieces of cryſtal; fill up the crucible with theſe, and lute on to it another crucible inverted, with a hole at the bottom as big as a ſmall pea; when the lute is dry, ſet the veſſel in a quantity of charcoal in a large chimney, covering them up with coals to the middle of the upper crucible: ſo long as the materials fume out at the hole, keep up a ſtrong fire; when that is over, let the fire go out of itſelf; and then unlute the crucibles; the greateſt part of the cryſtal will be found tinged to the colours of various gems; not only the opal, which will be very fair and beautiful, but the topaz and ruby colour will be ſeen in others.

A compoſition of ſemi-tranſparent white glaſs and paſte, reſembling the opal, may be formed by taking of the compoſition for hard Glass, or Paste, deſcribed under thoſe articles, ten pounds; and of horn, bone, or ivory, calcined to a perfect whiteneſs, half a pound: grind them well together, and fuſe them with a moderate heat. See art of imitating gems under the article Gems.

OPALIA, in *Antiquity*, feaſts celebrated at Rome in honour of the goddeſs Ops.

Varro ſays, that they were held three days after the expiration of the Saturnalia: according to Macrobius they were held on the nineteenth of December, which was one of the days of the Saturnalia. He adds, that thoſe two feaſts were celebrated in the ſame month, becauſe Saturn and Ops were huſband and wife; and that it is to them we owe the invention of corn and fruits: for which reaſon, the feaſt was not held till the harveſt and fruit-time were entirely over.

The ſame author obſerves, that the vows offered to the goddeſs were made ſitting on the ground; to ſhew, that ſhe was earth, the mother of all things.

OPALIN. See Magnesia *Opalina*.

OPALINKA, in *Geography*, a town of the duchy of Warſaw; 2 miles W. of Poſen.

OPARO, an iſland in the Pacific ocean, diſcovered by Capt. Vancouver in December 1791. Southward of the N.W. point is a ſmall bay, with a ſtrong beach, through which was the appearance of a conſiderable ſtream of water falling into the ſea. The ſhores were ſo ſmooth, that landing might have been effected without difficulty. Round to the N. of that point is a ſmall bay, in which are a ſmall iſlet and ſome rocks, behind which the ſhore may be very eaſily approached at any time. The S. extremity of the iſland appeared, in ſome points of view, to form a right angle, without the leaſt interruption in its ſides; about half a mile to the S.E. is a ſmall detached iſlet; the ſhores are interſperſed with ſandy beaches; its greateſt extent, in a N. 18° W. and S. 18° E. direction, is about 6½ miles, and it may poſſibly be about 18 in circumference. Its principal character is a cluſter of high craggy mountains, forming, in ſeveral places, moſt romantic pinnacles, with perpendicular cliffs, nearly from their ſummits to the ſea; in the intermediate chaſms there was no appearance of fertility or cultivation; they were chiefly clothed with ſhrubs and dwarf trees. The tops of ſix of the higheſt hills appeared like fortified places, reſembling redoubts, having a ſort of block-houſe, like an Engliſh glaſs-houſe, in the centre of each, with rows of paliſadoes, for a conſiderable way down the ſides of the hills, nearly at equal diſtances. Theſe ſeemed to be intended for advanced works, and apparently capable of defending the citadel by a few againſt numerous aſſailants. On all of them people were obſerved, moving about as if on duty. Theſe buildings were large enough to contain a conſiderable number of perſons, and they were the only habitations that were obſerved. Capt. Vancouver ſaw about 30 double and ſingle canoes, neatly conſtructed, though very narrow. The iſland did not appear to afford any large timber, the broadeſt planks of which the canoes were made not exceeding 12 inches. The total number of inhabitants on the iſland was eſtimated at not leſs than 1500. The natives appeared, notwithſtanding the uncultivated ſtate of the iſland, to be exceedingly well fed, of middling ſtature, very well made, with countenances open, chearful, and indicating hoſpitality. Their hair was cut ſhort, and they were

were entirely without cloathing. None of them appeared to be tattooed. S. lat. 27° 36'. E. long. 215° 58'.

OPATCHIN, a town of Kamtſchatka; 30 miles from Bolchoretſk.

OPATOW, a town of Poland, in the palatinate of Sandomirz; 16 miles W.N.W. of Sandomirz.

OPATRUM, in *Entomology*, a genus of inſects of the order Coleoptera, the generic character of which is: Antennæ moniliform, thicker towards the tip; the head is projecting from a cavity in the thorax; the thorax is a little flattened, and margined; ſhells emarginate, longer than the abdomen. There are twenty-eight ſpecies ſcattered over the globe, one of which only is common to our own country, to Europe at large, and to America.

Species.

GRISEUM. Cinereous; thorax plane; ſhells with three raiſed lines, toothed behind. It inhabits Italy, and is larger than the Sabuloſum.

PORCATUM. Grey; thorax plane; ſhells grooved, with raiſed black dots between the grooves. It inhabits Barbary.

* SABULOSUM. This is a brown inſect; the ſhells have three indented raiſed lines; the thorax is emarginate. It inhabits Europe and America.

GIBBUM. Black; ſhells with numerous obſolete raiſed lines. It inhabits Sweden, on ſand banks.

LÆVIGATUM. Black; the ſhield is pitchy before; the ſhells are ſubſtriate. It inhabits New Holland.

CRENATUM. Black; thorax with a crenate edge, the fore angle projecting, the hind one ſpinous; ſhells with crenate ſtriæ. It inhabits Sweden, on ſandy plains.

GLABRATUM. Black; thorax and ſhells ſmooth and cinereous. It is found in the Eaſt Indies, and is the ſize of the Sabuloſum.

ARENARIUM. Grey; ſhells ſtriate. It is found at the Cape of Good Hope.

CLATHRATUM. Black; ſhells with punctured ſtriæ. It inhabits Cayenne.

PLAGUM. Depreſſed, black, opaque; ſhells ſtriate, ſmooth. It inhabits Siberia.

GRANULATUM. Black; edge of the thorax ſomewhat reflected; the ſhells have three raiſed lines, the interſtices punctured. It inhabits the ſandy plains of Barbary.

ORIENTALE. Cinereous; thorax and ſhells rugged; foreſhanks dilated, triangular. It is found in the ſandy plains of the Eaſt.

TIBIALE. Black; ſhells punctured, a little rugged; fore ſhanks two-toothed at the baſe.

AGRICOLA. Black; thorax ſmooth; ſhells ſtriate. It inhabits Germany, and is a very ſmall inſect.

MINUTUM. Cinereous; thorax rough; ſhells with four raiſed lines. It is found in Sweden, and is very ſmall.

PUSILLUM. Cinereous, thorax rough; ſhells with many ſtriæ. It is ſmall and inhabits Hungary.

QUISQUILIARUM. Black; thorax granulate, ſmooth in the middle; ſhells very ſmooth.

CINEREUM. This is black; clouded with cinereous; the ſhells have punctured grooves. It inhabits India.

MELINUM. Ochraceous, ſmooth; thorax and ſhells faintly punctured. It is found in Germany, and is thought not to belong to this genus.

CINETERIUM. Bay, elongated; ſhells flat, very ſmooth. It inhabits Pomerania.

BIPUSTULATUM. Ferruginous; ſhells faintly grooved. This alſo is found in Pomerania.

LITHOPHILUS. Black, beneath ſcarlet; thorax ſcarlet, emarginate, pointed at the corners behind; the ſhells are very ſmooth; the tarſi are three-jointed. It inhabits Germany, and like the Melinum is of a doubtful genus.

MONILICORNE. Brown; thorax and ſhells villous. It inhabits Germany.

SILPHOIDE. Black, ſmooth; thorax dilated backwards; ſhells with punctured ſtriæ and two fulvous bands. It is found on the oak fungus.

UNIPUNCTATUM. Brown, hairy; thorax ſub-cylindric, emarginate, with a hollow in the middle; the two laſt joints of the antennæ diſtant and larger.

BIPUNCTATUM. Brown; thorax ſub-cylindric, emarginate, with two hollows; the two laſt joints of the antennæ diſtant and larger.

TESTACEUM. This is a teſtaceous inſect; the eyes, thorax, ſhells, and antennæ are brown, the latter rufous at the baſe and tip; ſhells with a large teſtaceous lunule at the baſe; thorax with two impreſſed dots. It inhabits Europe; ſhells punctured and ſtriate.

BRUNNEUM. Reddiſh-brown with yellow down; ſhells faintly punctured ſtriate, with ſix yellow ſpots; antennæ and legs pale yellow.

OPDAELSCHOW, in *Geography*, a town of Norway, in the province of Drontheim; eight miles S.W. of Drontheim.

OPDAL, a town of Norway, in the province of Drontheim; 54 miles S. of Drontheim.

OPE LAND, in *Agriculture*, provincially ground that is looſe or open, from its being ploughed up every year, or kept in conſtant tillage.

OPECKON, in *Geography*, a creek of America, in Virginia, the water of which is diſcharged into the Patowmac river. N. lat. 39° 30'. W. long. 77° 52'.

OPEGINSKAIA, a town of Ruſſia, in the government of Novgorod, on the river Mota; 60 miles E. of Novgorod.

OPEGRAPHA, in *Botany*, ſo named from οπη, *a chink* or *cleft*, and γραφω, *to write* or *engrave*, in alluſion to the nature of the fructification, which reſembles Hebrew or Oriental characters on a white or pale ground; whence one ſpecies, and indeed many long confounded under it, obtained the appellation of *Lichen ſcriptus*, from Linnæus and his followers.—Perſoon in Uſt. Annal. faſc. 11. Ach. Prodr. 19. Meth. 16. Lichenogr. 244. Sm. in Engl. Bot. 1753.—Claſs and order, *Cryptogamia Algæ*. Nat. Ord. *Algæ*, Linn. Juſſ. *Lichenes*, Achar.

Eſſ. Ch. Seeds in black, linear, ſeſſile, ſimple or branched, bordered clefts, in an uninterrupted cruſt.

No genus among the whole tribe of Lichens, now become a natural order, can be more clearly diſtinct than this. The *clefts*, technically ſo called, are a peculiar ſort of fructification, differing from the ſhields or tubercles of a *Lichen*, in their indefinitely oblong or linear form, and frequently branching nature, which laſt property ſeems a conſequence of the former. Their linear diſk, more or leſs intenſely black, is accompanied at each ſide by a parallel elevated border, ſometimes attended, rarely ſupplanted, by an acceſſory border from the ſubſtance of the cruſt. Theſe *clefts* are ſeſſile on, or ſometimes ſunk into, a continued cruſt, various in thickneſs, either membranous or chalky, moſtly white or pale, with a border more or leſs diſtinctly marked. The cruſt ſpreads in patches, generally over the ſmooth bark of trees, to which it is cloſely united, being rarely found on ſtones or walls.

Twenty-nine ſpecies of *Opegrapha* are defined in the *Prodromus* of Acharius, as a ſection of the great genus *Lichen*; in his *Methodus*, where *Opegrapha*, like the reſt of thoſe ſections,

ſections, is raiſed to the rank of a genus, they are reduced to 24, nor does the ſupplement to that work contain any new ones. In the more recently publiſhed *Lichenographia* of the ſame writer, we find 29 *Opegraphæ*, beſides eight ſpecies under a genus ſeparated therefrom by the name of *Graphis*, which appellation Adanſon originally gave to the whole, and it was retained by Ehrhart. There is moreover one ſpecies of each in the addenda.

The *Graphis* of Acharius is characteriſed by having the *clefts* ſunk into the cruſt, and their diſk naked, not covered by a black membrane; but the latter diſtinction ſeems to us very obſcure at leaſt, if not evaneſcent. There is certainly no natural difference or appearance to countenance this ſeparation.

Although ſome ſpecies of *Opegrapha* are defined with ſimple, and others with branched, *clefts*; even that difference is not invariable, examples of both being not unfrequent in the ſame individual, among the ſmaller leſs ſpecious kinds. Acharius has therefore, in his laſt work, laid it aſide, diſtributing the ſpecies according to the comparative breadth of their diſk.

The following examples may ſuffice.

O. *herpetica*. Eruptive Opegrapha. Ach. Lichenogr. n. 6. Meth. 23. Engl. Bot. t. 1789.—Cruſt tumid and ſomewhat rugged, browniſh olive grey. Clefts prominent, crowded, ſimple, oblong, convex, irregular.—Found by profeſſor Swartz in Sweden, and by Mr. Turner near Yarmouth, on the barks of trees. The uneven dirty olive cruſt diſtinguiſhes this ſpecies, which is one of the leaſt ornamental or attractive. The *fructification* is crowded over the ſurface, in little, coal-black, tumid, irregularly oval, wart-like *clefts*, very rarely cloven, never properly branched.

O. *Lyelli*. White-bordered Opegrapha. Engl. Bot. t. 1876.—Cruſt ſmooth, membranous, pale olive. Clefts prominent, turgid, crowded, curved, obtuſe, greyiſh and powdery, with an elevated, white, powdery border.—Diſcovered by Charles Lyell, eſq. on the rugged bark of trees in the New Foreſt, Hampſhire. It ſeems unknown to Acharius. The *cruſt* is very ſmooth, waxy in appearance, of an uniform pale olive green, and almoſt horny texture. The *clefts* are numerous and crowded, moſtly ſimple, various in length, curved, obtuſe or rounded at each end, very prominent; their diſk broad and convex, black, but clothed with greyiſh powder; their border very peculiar, originating from the cruſt, but white, powdery, and very thick.

O. *elegans*. Elegant Grooved Opegrapha. Engl. Bot. t. 1812. — Cruſt orbicular, granulated, white, ſomewhat ſhining. Clefts immerſed, ſcattered, divaricated, moſtly ſimple, with a grooved border.—This ſpecies, likewiſe, it ſeems, unknown to Acharius, was found by Mr. W. Borrer, on the ſmooth barks of young trees in Suſſex. Its peculiar character conſiſts in the proper border of the *clefts* being as it were double, divided by a longitudinal line or furrow, and there is a ſlight acceſſory border, from the cruſt, beſides. The *cruſt* is white and rather ſhining, all over granulated with regular minute prominences, but not mealy.

O. *ſcripta*. Black-letter Opegrapha. Ach. Meth. 30. Engl. Bot. t. 1813. (Graphis ſcripta; Ach. Lichenogr. 265. Lichen ſcriptus; Ach. Prodr. 25. Linn. Sp. Pl. 1606. Lichenoides cruſtâ tenuiſſimâ, peregrinis velut litteris inſcriptâ; Dill. in Raii Syn. 71. Muſc. 125. t. 18. f. 1 ?)—Cruſt thin, membranous, ſhining, ſmooth, greeniſh-white, bordered with black. Clefts immerſed, ſmooth, linear, ſlightly zigzag, ſimple, or much branched in a parallel direction.—Not uncommon on the even bark of trees in woods. The *cruſt* is broad and thin, of a greeniſh or browniſh-white, with a blackiſh edge. *Fructification* ſcattered, ſtrikingly reſembling Hebrew or Chineſe characters, which reſemblance is cauſed by the parallel, as well as frequently rectangular, direction of the numerous and various branches of the black linear *clefts*. Their diſk is paler than their borders, and eſteemed by Acharius to be naked. He enumerates five varieties of this ſpecies. Some of the *clefts* are ſimple, but they are always accompanied by ſuch as are much branched.

O. *dendritica*. Tree-like Opegrapha. Ach. Meth. 31. t. 1. f. 10. Engl. Bot. t. 1756. (Graphis dendritica; Ach. Lichenogr. 271.)—Cruſt tartareous, determined, very white and ſomewhat powdery. Clefts immerſed, depreſſed, without any elevated border, repeatedly branched, zigzag, tapering at each end.—Found in the ſouth part of England, by Mr. W. Borrer and Mr. Lyell, growing on the ſmooth bark of trees. The ſame, or a ſlight variety, was gathered in Spain, by Schouſboe. This is a moſt elegant plant. The cream-coloured, rather mealy, *cruſt* forms roundiſh patches, whoſe middle part principally is occupied by copious branched zigzag *clefts*, of a greyiſh-black, taper-pointed at each end, and ſpreading concentrically as it were toward the margin, which however they do not reach. They have no proper elevated border of their own ſubſtance, but the cruſt is ſlightly tumid at each ſide.

O. *aſtroidea*, Ach. Meth. 25. Engl. Bot. t. 1847, is now removed to the newer genus *Arthonia*, in Ach. Lichenogr. 144, where it makes the variety β of *A. radiata*.

OPEN, in *Geography*, a town of Pruſſia, in Ermeland; 14 miles W. of Heilſberg.

Open, the ſituation of a place expoſed to the wind and ſea. It is alſo expreſſed of any diſtant object to which the ſight or paſſage is not intercepted.

Open, in *Rural Economy*, a term ſometimes applied to cows or heifers, ſignifying that they are not in calf.

Open *Cuts*, in *Agriculture*, ſuch drains or gutters as are made in land by the ſpade, and left without being covered in. They are uſed in draining lands in particular caſes. And Mr. Nicol ſuggeſts, "that perhaps open cuts, if effectual, are the beſt of all for foreſt draining, as they cannot be inconvenient, from the plough not being employed after the trees are planted."

It is alſo found that cuts of this ſort are frequently uſeful in the practice of irrigation, watering, and floating.

Open-*Field Land*, that which is in a ſtate of commonage. It has been obſerved that the open field or unincloſed lands in ſome parts of the kingdom have undergone very little alteration in regard to the mode of occupation for ages. It is ſuppoſed, that to the ancient diſtribution of manors may be aſcribed the origin of what is now known in different parts of the kingdom by the name of open or common field lands, and in Scotland by that of runrig or rudridge. The ſcattered ſituation and ſmallneſs of the pieces of common field lands, ſtill frequently cultivated by one perſon, in many inſtances fifty or a hundred acres ſituated in nearly as many different places, evince, firſt, that the mode of diviſion, conſidering the then ſtate of the nation, was a matter of ſound policy, becauſe till about the cloſe of the ninth century, when England was divided into tithings and hundreds, there ſeems to have been no law but that of the ſword for the protection of private property; hence every inhabitant of the pariſh or townſhip, by having a common intereſt in the pariſh fields in caſe of any invaſion, became bound by the ſtrongeſt tie (ſelf-intereſt) to aſſociate with his neighbours in order to repel the foe. And in the ſecond place, it is alſo clear that the occupiers began with cultivating ſmall ſpots, an acre, or perhaps leſs, and, as population increaſed, and bread corn became ſcarce, they gradually increaſed their tillage lands.

Thoſe

Thoſe parts of the pariſh which were either unimprovable, or at too great a diſtance from home, were partly reſerved for the purpoſe of ſupplying fuel, pit-coal, if at all known, being only in common uſe in a few places. The remainder was allotted for the common paſturage of the pariſh cattle, which were by mutual agreement kept there during ſummer and harveſt; after which they were allowed to range over the arable lands till the return of ſpring.

It ought alſo to be obſerved that a certain portion of the manor or eſtate was ſet apart for the purpoſe of producing natural or meadow graſs to be made into hay. This meadow graſs was divided among the farmers, in proportion to the extent of their farms, either by lot or ſome kind of underſtood agreement. The cattle were excluded by mutual conſent at a certain period in ſpring, and it remained ſhut, as it is now termed, till hay harveſt was completed, after which the cattle were ſuffered to paſture during the remainder of the ſeaſon. It is aſtoniſhing that in ſuch a length of time as from the original diſtribution of manors in England to the preſent period, ſo little alteration ſhould have taken place in regard to the mode of occupying thoſe lands which remain in the open or common field ſtate, more eſpecially when it is conſidered that during this long interval a ſpirit for agricultural improvement ſeems at different periods to have become pretty general. In regard to the modes of cultivation which are adopted in reſpect to them, it is only neceſſary to remark, that previous to the introduction of turnips and artificial graſſes, the almoſt univerſal practice was to have three-fourths in grain, and one-fourth in fallow; and although, in ſome places, alterations have taken place, yet the inſtances are very rare in which a better ſyſtem is purſued.

Alſo the arable lands are divided into four fields as nearly equal as poſſible, and each of theſe fields (however many tenants may have an intereſt in the cultivation) muſt, by the eſtabliſhed rules, be wholly under the ſame kind of crop. This, added to the practice of paſturing their cattle on commons, will, according to Mr. Donaldſon, "for ever prevent the general introduction of artificial graſſes, or indeed almoſt any other ſpecies of improvement, till ſuch time as, either by the mutual conſent of all concerned, or the intervention of the legiſlature, the ſyſtem is entirely aboliſhed."

It is therefore evident, "that the open-field lands, which in ſome counties amount to above one-third of the whole, are deficient in point of produce at leaſt one half, when compared with that of incloſed lands under proper management. That open or common field huſbandry is therefore an obſtruction to agriculture, muſt be generally allowed, and an obſtruction ſo ſerious in its nature as to create a deficiency, on the ſuppoſition of there being one-fourth part of the tillage-land in this country in the open field ſtate, of at leaſt one-eighth of the marketable produce of the country. When this is ſtated, and when it is further added that no proprietor or tenant of open-field lands can introduce any improvements in the modes of cropping or of general management without the conſent of the pariſh-community of which he is a member, and none that can be binding upon them without an act of parliament, the abſurdity of allowing lands to remain in the open field ſtate muſt appear ſtill more glaring." And "ſome facts have been brought to light by means of the Board of Agriculture, which, in proof of theſe aſſertions, it may not be improper to mention. The report of the county of Buckingham contains the following ſtatement: 'About eighteen years ago, the pariſhioners came to an agreement, and obtained an act, to lay the ſmall pieces of land together.' One farmer, at that period, had eighteen acres in thirty-one different pieces, and at wide diſtances from each other. When the diviſion took place, the balks were, of neceſſity, ploughed up, by which a great portion of the ſheep-paſture was deſtroyed. It became then expedient, and it was agreed upon at a public veſtry to ſow clover and turnips as a ſuccedaneum for the balks. Two years ſince (that is, ſixteen years after this arrangement had taken place among the pariſhioners), one of the farmers, occupying ſixteen acres of theſe common fields, procured in the month of May a large flock of lean ſheep, which he turned on the clover crops, being then nearly in bloom, the greater part of which they devoured. Another inſtance of the impoſſibility of pariſhioners being able to arrange any mode by which improvements can be introduced, which individuals are bound to adhere to without the ſanction of parliament, is alſo detailed in the ſame report, in the following words: The pariſh of Steeple Claydon contains 2500 acres of ſtrong wet clay. The cuſtom is here, to have one crop and one fallow. About fourteen years ago the proprietors came to an agreement to have two crops and a fallow; but before the expiration of ten years, one of the farmers broke through the agreement, and turned in his cattle among the crops of beans, oats, and barley; in which plan he was ſoon followed by the reſt of his neighbours; and the crops on that part of the field, which, agreeable to the ancient cuſtom, would have been fallow, were in conſequence totally deſtroyed. Farther, "conſidering the immenſe national loſs ariſing from ſo great a portion of the cultivated and cultivable lands in this country remaining in the open field and commonable ſtate, the great additional expence which farmers are liable to in cultivating lands diſperſedly ſituated, and the inferiority of crops reaped from lands, however good in quality, that are ſubjected to a never-ending rotation of corn crops, it is no wonder that the report of every county in the kingdom ſhould contain an earneſt ſolicitation to the members of the Board of Agriculture, to ſuggeſt ſuch meaſures as are moſt likely to receive the ſanction of the legiſlature, and to meet the approbation of all the parties concerned, for removing obſtacles, which, while they are permitted to exiſt, muſt exclude the poſſibility of improving the agriculture of the country."

But, "to arrange general equitable principles, on which manorial rights can be purchaſed, and commons divided and rendered private property, and on which likewiſe proprietors of pariſhes ſhall be at liberty to incloſe, and to introduce new and better modes of huſbandry on their eſtates, are ſubjects of infinite importance to the future proſperity of the country; and as ſuch call loudly for the immediate intervention of the legiſlature."

Here, after ſtating and obviating the objections which have been ſtated againſt the dividing of commons and the incloſing of pariſhes, and after pointing out the advantages that experience has, in many inſtances, proved to have reſulted from adopting theſe means of improvement, what appears the moſt probable way in which they can be generally introduced? But it is ſuggeſted the depopulation of the country, which is ſuppoſed a neceſſary conſequence of diviſions of commons, or incloſing of pariſhes, is held out as a grand objection againſt the general adoption of either of theſe meaſures. The fact, however, it appears from the Agricultural reports, is quite the contrary; and to thoſe who attempt to argue againſt facts, it is unneceſſary to make any reply. Can thoſe meaſures tend to the depopulation of the country which have for their object the production in greater abundance of the means by which an increaſed population can be ſupported? Has not every farmer the power of cultivating his land to greater advantage when incloſed, or in ſeveralty, than when intermixed with that of others? Can any farmer cultivate his farm to the greateſt poſſible advan-

tage without more than ordinary labour? Does not this neceſſarily require an additional number of labourers? To all theſe queſtions the anſwers muſt certainly be in the affirmative. It may be admitted, that the inhabitants of a pariſh muſt undergo a very material alteration in their ſituation in conſequence of its being incloſed; yet it does not follow that the depopulation of the country muſt be the conſequence. Though ſeveral of thoſe who occupy ſmall farms muſt neceſſarily be removed, in order to enable the proprietors to claſs the lands into farms of a proper ſize, it is equally obvious, that a new ſet of people muſt be introduced; ſuch as hedgers, ditchers, road-makers, and labourers of every ſort. This may therefore be called an alteration in the deſcription of the inhabitants, a ſhifting of population from one pariſh to another, rather than an expulſion, or a decreaſe of the number of inhabitants in one particular pariſh. Were it evident, however, that depopulation was the conſequence of incloſing a pariſh, it will be found that that depopulation does not ariſe from the circumſtance of the pariſh having been incloſed, but from the total alteration of the ſyſtem that too commonly takes place in the after-management of the lands. If the lands, in the place of being laid down to graſs, as is the prevailing practice, were cultivated in an alternate courſe of grain and graſs huſbandry, the number of hands neceſſary for the cultivation, and for carrying on and following out the various improvements which in ſuch a caſe would be immediately introduced, would be at leaſt equal, if not greatly ſuperior, to that of the inhabitants at any period while it remained in the common or open-field ſtate.

The next objection againſt the adoption of either of theſe meaſures is, the depriving the commoners of their rights of commonage. This philanthropic argument is apt, with the man of humanity, like Aaron's rod, to ſwallow up every other that can be urged in favour of the public, or of the other individuals concerned. But let us pauſe a moment, and inquire what theſe rights are. It is preſumed, after the moſt minute inquiry, it will be found that the rights of commonage in this part of the country were, as in Scotland, veſted originally in the proprietors of the adjoining tillage lands; and that the new claimants of rights of commonage have acquired theſe rights, ſuch as they are, in almoſt every inſtance, through the negligence of the actual proprietors, who allowed theſe aſſumed rights to acquire the ſanction of the law, in conſequence of preſcription. That this is the origin of common rights in this part of the kingdom, and that they are more common on the crown-lands, ariſing from the cauſe now aſſigned, 'negligence,' will not be denied. But they are rights; and 'curſed be he that removes his neighbour's land-mark,' is a maxim that ought to be imprinted on the mind of every man. It does not, however, thence follow, that, to accommodate thoſe poſſeſſing rights of common, the public, or the principal proprietors, who would be benefited by a diviſion, ſhould ſacrifice their intereſt, ſhould allow the productive powers of theſe uncultivated waſtes to remain dormant, becauſe it is the inclination of thoſe who have thus acquired rights that they ſhould do ſo; far leſs does it follow, that, whether theſe rights have been acquired through legal indiſputable title, or through the ſufferance of the proprietors of the adjoining eſtates, the owners of them cannot, on the diviſion of a common, get a full and fair equivalent in property land for their rights of commonage. Whoever would maintain this doctrine, would maintain that the laws of England were framed for the protection of the rights of the rich, but that the poor had no intereſt in them. The advantages derived by the cottagers, in virtue of theſe rights, are, for the moſt part, merely ideal: yet, if ever a diviſion of the commons in England takes place, it will, for the reaſons mentioned above, become the indiſpenſable duty of the commiſſioners acting in ſuch caſes, both in point of humanity and ſound policy, to act liberally towards the cottager, and to give him an adequate allowance of property land for his preſcriptive rights. Commiſſioners ſo acting ought to conſider, that in a national view, whether A, B, or C, are the proprietors of theſe commonable lands, it is a matter of no ſort of importance, provided they are once put in the train of improvement, and which can only be done by converting them into property. Theſe commiſſioners ought farther to conſider, that ſcarcely any ſum of money they can award is an adequate compenſation for a cottager's right of common. The money may be ſoon diſſipated: but rights of paſturage, or lands in property, are funds more permanent in their natures. When a poor cottager receives a piece of money in compenſation for his rights of commonage, which is but too frequently the caſe under pariſh incloſure bills, the funds which were allotted for the ſupport of his family, are, as it were, ſet afloat; and it is a thouſand to one if they again ſettle on any friendly ſhore. It cannot, therefore, be too often repeated, that there is no compenſation a cottager can receive for his right of commonage ſo juſt and equitable, or to him and his family ſo beneficial, as land in property. Another objection to incloſing pariſhes, or to a diviſion of open fields, lands, or commons, is the expence of the act of parliament neceſſary to carry either of theſe meaſures into effect; and, when completed, to make the arrangement binding upon the parties. It is certainly mortifying to a proprietor that he can ſcarcely adopt any plan for improving his eſtate, without paying ſome hundred pounds to the clerks of parliament for doing nothing but regiſtering the edicts of the legiſlature; and for doing which, if they are not properly paid from the public funds, they at leaſt ought to be, ſo as to prevent them from levying a heavy tax on the more enterpriſing, public-ſpirited, and praiſe-worthy individuals of the community. Let litigious people, when they make appeals to the ſupreme tribunal of the nation, pay what the avarice of the official people may dictate; but let every application for the interpoſition of the legiſlative authority to ſanction meaſures calculated to promote the proſperity and improvement of the country, be laid before parliament without fee or reward. The only other objection which is noticed is, that if all the open fields and improvable commons were brought into a ſtate of cultivation, it would materially affect the intereſt of the owners of the already improved lands. Such a narrow-minded ſentiment ought to be treated with ſilence and contempt, did it not prove that thoſe who are capable of ſuggeſting it were ſatisfied, that however much individuals might ſuffer, the intereſt of the nation at large would be promoted, were every improvable acre in the iſland in a proper ſtate of cultivation. This being granted, it may be aſked, ought the intereſt of the public to be ſacrificed to promote that of a few individuals? But no apprehenſions need be entertained on that account. Although 'trifles light as air' ſeem with ſuch reaſoners to have the weight of 'words of holy writ,' yet the judicious and intelligent muſt be convinced, that while the commerce of Britain keeps on in a progreſſive ſtate, there is no extent of ſuperabundant produce that can be raiſed in the iſland which will not meet a ready ſale in ſome foreign market or other.

In reſpect to the advantages to be derived from a general diviſion of the commons, and the incloſure of the open-field pariſhes in this part of the iſland, although they are numerous, the moſt important of them are only mentioned. It is only

only in thoſe countries where the means of ſubſiſtence can be had in abundance, and on reaſonable terms, that population increaſes with rapidity. In political calculations the riches of a ſtate are eſtimated by the number of its inhabitants. As theſe cannot increaſe to any conſiderable degree where the means of ſubſiſtence are limited, it is evident, that by adopting the meaſures above-mentioned, by which only a great addition can be made to the national ſtock of proviſions, the ſtate would become richer, as it would then be able to furniſh from its own lands the means of ſupporting an increaſed population. Beſides, were theſe meaſures adopted, it is obvious that the national territorial revenue would be, to an immenſe degree augmented; that of this part of the kingdom, in all probability, one-third at leaſt beyond what it is at preſent. This fact is elucidated by the following extract from the writer's report of the county of Northampton: "The average rent of an acre of open-field land in this diſtrict, including the value of the tithes, which may be reckoned at three ſhillings and ſixpence the acre, may amount to eleven ſhillings and ſixpence; while that of an acre of incloſed land (including a ſimilar ſum for tithes,) may be reckoned at twenty ſhillings, which makes a difference of eight ſhillings and ſixpence the acre. There are eighty-nine pariſhes in this county in the open-field ſtate, which may contain nearly 150,000 acres; the rent which the proprietors therefore loſe, by keeping theſe pariſhes in the open-field ſtate, may be eſtimated at upwards of 60,000*l.* a-year; while at the ſame time an introduction of agricultural improvements is precluded, and conſequently an increaſe of rent on rational principles."

And beſides "an increaſe of population, of the quantity and quality of grain, and of territorial revenue, the improvement of the different ſpecies of live-ſtock is another advantage which uniformly reſults from incloſing land. The farmer, no longer under the neceſſity of mixing his herds or his flocks with thoſe of others, is at liberty to purſue ſuch meaſures as he judges moſt expedient; and while he purchaſes tups, bulls, and ſtallions of the beſt ſort, to improve his ſtock, he alſo takes care, by ſuperior cultivation, and a more judicious rotation of cropping than he was before at liberty to adopt, that they ſhall not be ſtinted in their growth by the want of provender. Such is the account of the advantages that are likely to reſult from a general diviſion of commons and the incloſure of open-fields, which the writer, from a careful peruſal of the agricultural reports of the different counties of England, and his own general knowledge of the ſubject, is able to lay before the reader. Experience having proved, in very many inſtances, that theſe, and ſeveral others of no inconſiderable importance, have actually reſulted, it muſt appear ſurpriſing that any peer of parliament ſhould ſtand up in his place and maintain an oppoſite doctrine; yet whoever peruſes the Parliamentary Regiſter for 1781, will find that this was the caſe."

Open *Flank*, in *Fortification*, is that part of the flank which is covered by the orillon.

Open *Fire*. See Fire, and Reverberatory.

Open *Fountain*. See Fountain.

Open *Hawſe*. When a ſhip at her moorings has her cables ſtraight to her anchors, without croſſing, ſhe is ſaid to ride with an *open hawſe*.

Open *Pound*. See Pound.

OPENACA, in *Geography*, a town of Ceylon; 38 miles S. of Candy.

OPENING *a Vein*. See Phlebotomy.

Opening *of Trenches*, is the firſt breaking of ground by the beſiegers, in order to carry on their approaches towards a place. See Trench.

Opening *of Gates*, in *Aſtrology*, is when one planet ſeparates from another, and preſently applies to a third, bearing rule in a ſign oppoſite to that ruled by the planet with which it was before joined.

Opening *the Mouth*. See Mouth.

Opening-*Weirs*, are a ſort of moveable weirs or pens for the waters of rivers that are ſubject to floods.

OPERA, a dramatic and lyric repreſentation, in which all the fine arts conſpire to form a ſpectacle full of paſſion, and to excite, by the aſſiſtance of agreeable ſenſations, intereſt and illuſion.

The conſtituent parts of an opera are the poem, the muſic, and the decorations. The mind is addreſſed by the poetry, the ear by the muſic, the eye by the painting; and the whole ought to harmonize, in order to move the heart, and convey to it at once the impreſſion through different organs. Of theſe three parts, our ſubject does not permit us to conſider the firſt and laſt, but as they are connected with the ſecond; ſo that we ſhall immediately proceed to muſic, the ſecond conſtituent part.

The art of combining agreeable ſounds may be regarded under two different aſpects. Conſidered as an inſtitution of nature, muſic is confined to the pleaſure which reſults from melody, harmony, and rhythm; ſuch is, in general, the muſic of the church; ſuch are the airs for dancing, and for common ſongs. But as an eſſential part of the lyric ſcene, of which the principal object is imitation, muſic becomes one of the fine arts, capable of painting every picture, exciting every ſentiment, contending with poetry, giving it new force, embelliſhing it with new charms, and triumphing over it by enriching it with new beauties and new allurements. The ſounds of the *ſpeaking* voice, not being harmonical or ſuſtained, are ſo evaneſcent, and move in ſuch ſmall intervals, as not to be appreciable, and conſequently can never unite agreeably with the ſinging voice, and inſtruments that produce the ſame intervals; at leaſt in modern languages, too remote from the muſical character: for we are unable to underſtand many paſſages of the Greeks concerning their manner of reciting, but by ſuppoſing their language ſo accentuated, that the inflexions of ſpeech in a ſuſtained declamation form among themſelves muſical and appreciable intervals, ſo that we may ſay their theatrical pieces were a kind of opera; and it is even for this reaſon that we can have no opera properly ſo called among us. But if the declaiming ſpeech of the Greeks was not tuneful, what effects could be produced by the *Echeia*, or vaſes tuned to muſical intervals, in the theatres of the Greeks, as deſcribed by Vitruvius, lib. v. cap. 5?

Thus far Rouſſeau, whoſe ideas on the ſubject are always elegant and ingenious; but we fear they will never be fulfilled, at leaſt in France.

We muſt now trace the origin of muſical dramas, and point out by what gradations they have been brought to the acme of ſuch perfection as they have attained in Italy, Spain, Portugal, Vienna, Dreſden, Ruſſia, and London. The annals of modern muſic have hitherto furniſhed no event ſo important to the progreſs of the art, as the recovery or invention of *recitative*, or dramatic melody: muſicians till this period having been chiefly employed in gratifying the ear with "the concord of ſweet ſounds," without reſpect to poetry, or aſpiring at energy, paſſion, intellectual pleaſure, or much variety of effect. Epic poetry could never derive great advantage from muſic, or muſic from epic poetry: ſo long a poem as the Iliad, or Æneid, if we ſuppoſe either of them to have been originally ſung,

could admit of few embelliſhments or refinements from lengthened tones; it was the *lyric* poetry of the ancients as well as the moderns, conſiſting of ſhort effuſions of paſſion or ſentiment, in various meaſures, that beſt exerciſed the powers of muſical expreſſion. That narration which is ſung, like the epic poems of the ancients by the original bards, or their dependents the rhapſodiſts, as well as the hiſtorical ballads of later times, muſt have been ſet to the moſt ſimple and artleſs melody, or it would have been utterly unintelligible.

Pulci, who is regarded as the Ennius of modern Italy, and the firſt who attempted an epic poem in the language of that country, is ſaid by Creſcimbeni to have ſung his "Morgante Maggiore," at the table of Lorenzo de' Medici, in the manner of ancient rhapſodiſts, about the year 1450, by which we may conjecture, that the muſic was very ſimple.

As the Orfeo of Politian was certainly the firſt attempt at the muſical drama, which was afterwards perfected by Apoſtolo Zeno and Metaſtaſio, we ſhall give the reader a ſketch of the fable.

To this drama there is an argument in verſe. The piece is in five acts.

Ariſtæus, a ſhepherd, the ſon of Apollo, loved Eurydice, the wife of Orpheus, in ſo violent a manner, that he purſued her in the fields; and in her flight from him, ſhe was bitten by a ſerpent, of which ſhe died. Orpheus, by ſinging, ſo ſoftened the infernals, that they ſuffered her to depart, on condition that he would not look behind him. But not obeying this injunction, ſhe was forced back to hell. Upon his great grief, and reſolution never to love another female, the Thracian women tore him to pieces.

At the latter end of the 16th century, during all the rage for fugue, elaborate contrivance, and the laboured complication of different parts, without rhythm, grace, melody, or unity of deſign; the lovers of poetry were meditating the means of reſcuing her from muſical pedants, who, with a true Gothic ſpirit, had loaded her with cumbrous ornaments, in order, as was pretended, to render her more fine, beautiful, and pleaſing, after having fettered, maimed, and mangled her.

That no muſical dramas, ſimilar to thoſe that were afterwards known by the names of operas and oratorios, had exiſtence in Italy before the beginning of the 17th century, ſeems certain by no mention being made of them in the ample liſt given by Angelo Ingegneri, 1598, of all that were then known, in his diſcourſe on the repreſentation of dramatic fables and poetry, where he treats of *tragedie*, *comedie*, *paſtorali*, *piſcatorie*, *boſchereccie*, &c. all declaimed entirely, except the choruſes, which ſeem to have conſiſted of odes or madrigals, ſet to muſic in parts. Muſic is the *firſt* conſideration in operas and oratorios; but this author ſays at the end of his book, "I now come to muſic, the *third* and *laſt* part of dramatic repreſentations, which, in comedies and paſtorals, without choruſes, will be uſed at pleaſure, in interludes, between the acts, to relieve the ſpectators, whoſe minds may be fatigued by the attention they have beſtowed on the fable."

We are often told, however, of muſical dramas performed at Rome and Venice, long before this period: and every writer on the ſubject informs us, that Sulpitius, in his dedication of Vitruvius, ſpeaks of a tragedy that was recited and ſung at Rome, under the auſpices of cardinal Riario, 1480; that Alfonſo della Viola ſet a drama to muſic, in 1560, for the court of Ferrara; and that at Venice there was an opera performed for the entertainment of Henry III. of France, at his return from Poland, on the death of his brother Charles IX., 1574, which was ſet by the famous Zarlino. Theſe, and more, have been confounded by father Meneſtrier with the muſical dramas of later times, after the invention of recitative, which alone ſhould diſtinguiſh the opera and oratorio from every other ſpecies of theatrical exhibition; but theſe early attempts at ſinging were no more dramatic than a maſs, ſervice, full anthem, or madrigal, would be if ſung on a ſtage. Indeed, ſome of the dramas, which preceded the year 1600, had choruſes, and intermezzi in meaſured muſic, and incidental ſongs, like our maſques in the reigns of queen Elizabeth and James I., in which, however, the dialogue was all ſpoken.

Three Florentine noblemen, *viz.* Giovanni Bardi, count of Verona, Pietro Strozzi, and Jacopo Corſi, of good taſte in literature, being diſcontented with every former attempt at perfecting dramatic poetry and exhibitions, determined to unite the beſt lyric poet with the beſt muſician of their time; and therefore choſe Ottavio Rinuccini and Jacopo Peri, their countrymen, to write and ſet to muſic the drama of Dafne, which was performed in the houſe of ſignor Corſi, in 1597, with great applauſe; and this ſeems the true era whence the opera, or drama, *wholly ſet to muſic*, and in which the dialogue was neither ſung in meaſure, nor declaimed without muſic, but *recited* in ſimple muſical tones, which amounted not to ſinging, and yet was different from ſpeech, ſhould be dated. After this ſucceſsful experiment, Rinuccini wrote Euridice and Arianna, two other dramas for the ſame kind of muſic.

The revival of theatrical muſic was brought about by the invention of recitative, which is now univerſally received, practiſed, and preferred to the madrigal ſtyle, in which the words are ſo utterly unintelligible.

Peri, in his preface, after enumerating the great perſonages who were preſent at the repreſentation of the muſical drama of Euridice at Florence in 1600, and the eminent muſicians to whom his muſic had been ſhewn, tells us, that it was ſung by the moſt excellent performers of the time; among whom were ſignor Franceſco Raſi, a nobleman of Arezzo, who repreſented the part of Aminto; ſignor Brandi, Arcetro; and ſignor Melchior Palantrotto, Pluto. He then tells us, that "behind the ſcenes, ſignor Jacopo Corſi played the harpſichord; Don Garzia Montalvo the chitarone, or large guitar; Meſſer Giovambatiſta dal Violino the lira grande, or viol da gamba; and Meſſer Giovanni Lapi a large lute."

Theſe four ſeem to have compoſed the whole band. For though he celebrates the performance of Giovambatiſta Jacomelli on the violin, neither he, nor any one elſe, played on that inſtrument at the exhibition. He concludes his account of this drama by owning that ſome parts of it were compoſed by Giulio Caccini, detto Romano, "whoſe great merit was known to the whole world," becauſe it was to be ſung by perſons dependent on him; by which he probably means to ſay, that they were his ſcholars. He boaſts of having *opened the road* for others, by his eſſays at dramatic muſic.

Monteverde ſet Rinuccini's Arianna for the court of Mantua, in 1606; the words only were then printed, and reprinted ſeveral times after. This opera was performed at Venice, 1640, to Monteverde's compoſition, and the words again reprinted; but whether the muſic was ever publiſhed, we know not.

In a diſcourſe by Pietro della Valle on the muſic of his own time, addreſſed by that celebrated traveller to Lelio Guidiccione in 1640, and publiſhed in the ſecond volume of the works of Battiſta Doni, at Florence, 1763, there is an intereſting, clear, and admirable account of the ſtate of muſic in Italy, but particularly at Rome, during the beginning of the 17th century.

This

This agreeable writer, who had ſtudied muſic under the beſt maſters from ſeven years old, and who ſeems to have been an excellent judge of the ſubject, having differed in opinion from his correſpondent, who, in converſation, had aſſerted that muſic for 50 years back had been declining, and that there were no profeſſors left equal to thoſe of former times; La Valle endeavouring to prove, on the contrary, that, ſo far from having degenerated, it was in a ſtate much nearer perfection at the time he wrote, than at any former period.

If canons, fugues, inverſions, and all the artifices of elaborate and learned compoſitions are leſs practiſed in vocal muſic now, ſays the author, than formerly, it is becauſe they are ſo unfavourable to poetry, and the intelligence of what is ſung; for in fugues of many voices, there are as many different words as notes ſung at the ſame time, which occaſions ſuch confuſion, that it is utterly impoſſible to diſcover the ſentiment of the poet, which is the ſoul of the ſong, and that which chiefly makes a voice ſuperior to an inſtrument. If the words and the notes do not mutually help to explain and enforce each other, they are ill-matched, and unfit to be together. To the confuſion ariſing from all the parts ſinging different words at the ſame time, may be added the little attention to accent in fugues, where the ligatures and other accidents in harmony frequently throw the emphaſis on wrong words, and make long ſyllables ſhort, and ſhort long. Another inconvenience, or rather abſurdity, ſeems inevitable in vocal fugues of much ſubtilty and contrivance, where quick and ſlow, chearful and pathetic notes, are moving at the ſame time, which makes good performers unwilling to ſing them, as they can neither manifeſt taſte, nor ſenſe, in the execution.

The old maſters certainly were well acquainted with harmony, but few knew what uſe to make of it. Their compoſitions are full of the moſt artful and difficult inventions and contrivances, which the ear can neither taſte nor comprehend in the performance.

This is not the method by which modern maſters proceed: they have learned how to chooſe and reſpect good poetry, in ſetting which they relinquiſh all the pedantry of canons, fugues, and other Gothic inventions; and, in imitation of the ancient Greeks, aſpire at nothing but expreſſion, grace, and propriety.

The firſt good compoſitions that have been heard of this kind, in modern times, were Daſne, Euridice, and Arianna, written by Rinuccini, and ſet by Jacopo Peri and Monteverde.

In ſpeaking of the madrigaliſts of his own time, Valle ſays, though they had improved and poliſhed that ſpecies of compoſition far beyond thoſe of the preceding age, yet they grew every day in leſs requeſt than formerly; as the ſinging ſingle ſongs with taſte and expreſſion, accompanied by an inſtrument, was now preferred to four or five people poring over their books at a table, which ſeemed too ſtudious and ſcholaſtic for the entertainment of a company.

In the firſt operas, muſic was the principal object, with mythological characters in the fable. Machinery next took the lead, with perſpective and decoration; when it was impoſſible to tire an audience at a greater expence.

It was near 50 years before regular airs had admiſſion in theſe early muſical dramas. At firſt they were generally accompanied by the ſinger himſelf on the violin, harp, or violoncello; but during the mythological paſſion, and rage for machinery, the only wiſh of the impreſario was to dazzle the eyes, and ſtun the ears of the audience.

Gods and devils, heroes and heroines, and at length men and women, as hiſtory repreſents them, were brought on the ſtage. Theſe ſeveral reforms and changes of taſte in the public led at length to Apoſtolo Zeno and Metaſtaſio; when the exquiſite airs of Leo, Vinci, and Pergoleſi, with the great vocal talents of a Piſtocchi, Nicolini, Farinelli, the Fauſtina, and Cuzzoni, exalted the lyric ſtage to its higheſt degree of public favour.

Rouſſeau's reflections on the language moſt proper for muſic are all levelled at the French, and at their naſal, equivocal, and mute ſyllables. He has an excellent period on the imitations of painting and muſic: "Muſic imitates the ſentiments, painting the image of man."

Imitations in painting are always cold, from the want of that ſucceſſion of ideas, and thoſe impreſſions which heat and inflame the ſoul by degrees; whereas in painting, every thing is ſaid at the firſt glance. The imitative power of this art, with many apparent objects, is confined to very feeble repreſentations. It is one of the great advantages of a muſician, that he is able to paint things which cannot be *heard*, while it is impoſſible for the painter to delineate what cannot be *ſeen;* and the greateſt prodigy of an art, which has no other activity than its movements, is to be able to paint the image of repoſe, of ſleep, a calm night, ſolitude, and even ſilence, among muſical pictures. Sometimes noiſe produces the effect of ſilence, and ſilence the effect of noiſe: as when a man ſleeps at an equal and monotonous reading, and wakes the inſtant it ſtops; and it is the ſame for other effects. But the art has ſubſtitutions more fertile and more ſubtile than theſe. It can excite by one ſenſe ſimilar emotions to thoſe that can be excited by another: and as the relation can only be ſenſible by a ſtrong impreſſion, painting, in want of ſuch force, returns with difficulty to muſic thoſe imitations which ſhe has drawn from her. Let all nature ſleep, he who contemplates the ſight is not aſleep; and the muſician's art conſiſts in ſubſtituting, to the inſenſible image of the object, that of the movements which its preſence excites in the mind of the ſpectator. He does not repreſent the immediate object, but awakens in our minds the ſame ſentiment which we experience in ſeeing it. Rouſſeau goes deep into dancing. See BALLET.

Operas in general are not to be read or ſpoken, but to be ſung; and "nonſenſe well tuned" has at all times been heard with pleaſure. But there is agreeable nonſenſe, and there are pleaſing trifles. Muſic can pleaſe without words, as well as poetry without muſic: each has it votaries and diſtinct powers of affording delight. The union of both is certainly beſt; as the words, if they could be underſtood, might not only pleaſe but convey inſtruction. But there is a jealouſy between the two ſiſters, Muſic and Poetry, which prevents them not only from being kind relations, but good neighbours. Yet does not Poetry frequently beg aſſiſtance from Muſic to embelliſh both her tragedies and comedies with incidental ſongs, ſymphonies, choruſes, ſoft muſic, marches, act tunes, &c. even in her regular dramas that are declaimed, ſuch as Macbeth, the Tempeſt, Fair Penitent, &c. without Muſic thinking herſelf degraded by acting a ſubordinate part? And might not Muſic aſk the aid of her ſiſter Poetry, to furniſh her with impaſſioned words, as vehicles for her ſtrains as principal? If this were done reciprocally and cordially, with a ſincere wiſh to aſſiſt and exalt each other by turns, without envying and grudging every mark of approbation that is beſtowed on her rival, and regarding it as a robbery from herſelf, each might ſeverally diſplay her peculiar powers of charming and inſtructing by turns, without injury or degradation.

A lyrical drama is incomplete without muſic, which is not the caſe with a play written for declamation: yet people are diſſatisfied if an opera does not read in the cloſet as well

as a tragedy or comedy. Unreaſonable critics want to unite two things totally incompatible, ſtrength and energy with melodious ſoftneſs. They want black and white to harmonize, without tinging or deforming each other.

Verſes full of philoſophy and ethics, ſtrong reaſoning, bold metaphors, or epigrammatic wit, muſt be enfeebled by muſic, which conveys them ſlowly to the mind; though paſſion, ſentiment, graceful and pleaſing images and deſcriptions, are embelliſhed by it. Degrading poetry to elevate muſic, would be acting in a hoſtile manner to our own pleaſures. Let poetry be regarded as an intellectual pleaſure, if you pleaſe; and muſic be ranked, like painting, as an innocent gratification of ſenſe. There ſurely can be no more harm in liſtening with rapture to fine muſic well executed, than in regarding with delight and wonder a cartoon of Raphael, or a holy family of Correggio. Sublime poetry leaves the muſician nothing to do.

No people write about muſic more agreeably, or with reaſoning more ſpecious, than the French; and for themſelves, and their own powers of execution, it is more than ſpecious: for, ſinging out of the queſtion, it is oracular. In France, where the art of ſinging is unknown, at leaſt by their public ſingers, their dramas ſhould be calculated for declamation, by which they would be rendered more intereſting, and more impreſſive, than where ſinging is the principal talent to be diſplayed.

But when great ſingers are employed at an enormous expence, who have voices highly cultivated, and are poſſeſſed of uncommon powers of embelliſhing ſound, and of rendering muſic ſomething more than *vox pretereaque nihil*, why ſhould they be denied the opportunity of diſplaying their abilities, and the lovers and judges of muſic of receiving delight from their exertions? There is nothing immoral in ſound, if it is even connected with vice or immorality: it is by keeping bad company, and embelliſhing the ribaldry and nonſenſe of another art;—it is needleſs to ſay that *poetry* is in fault.

Opera *Buffa*, or *Burletta*, in *Italian Muſic*. It was the opinion of Muratori (Della Perf. Poeſ.), that a muſical drama or farce, called "L'Anfiparnaſo," written and ſet by the celebrated Orazio Vecchi, and acted and printed at Venice, 1597, was the origin of the *opera buffa*, or comic opera, in Italy; and that learned antiquary ſeems implicitly to have founded his opinion upon the author's own words; who, in the preface, ſays, that his performance is an "accoppiamento di comedia e di muſica, non più ſtato fatto, ch' io mi ſappia, da altri, e forſe non imaginato: A union of comedy and muſic, never attempted, to his knowledge, nor perhaps ever thought of before." The ſeveral Italian ſtates being under different governments, and having but little communication with each other, may account for Orazio Vecchi's ignorance of any attempt at a muſical drama before; but Muratori, in later times, ſhould have known what every ſtranger is able to learn from the general regiſter of dramas of every kind in the "Drammaturgia di Lioni Allacci," that beſides the Sacrifizio of Beccari, ſet to muſic by Alfonſo Viola, at Ferrara, in 1555, there are innumerable muſical dramas upon record of a higher date than l'Anfiparnaſo of Orazio Vecchi: as I Pazzi Amanti, rappreſentata in muſica in Venezia, 1569; La Poeſia Rappreſentativa, componimento per Muſica, Ven. 1574; La Tragedia, componimento, poeſia di Frangipani, muſica di Claudio Merula, Ven. 1574; La Poeſia Rappreſentata, componimento muſicale cantato in Venezia, l'anno 1578; Il Re Salamone, rappreſentatione muſicale, cantata in Ven. 1579; Pace, e Vittoria, rappreſentazioni cantata in muſica, in Ven. 1580; Pallade, componimento per muſica, in Venezia, 1581, and Il Fiore, rappreſentazione cantata in muſica, Ven. 1582, &c. moſt of which were probably ſung to the ſame kind of muſic as Vecchi's Comedia Armonica; but to none of them can the title of opera be accurately given, as they all preceded the invention of narrative melody, or recitative, which, in our opinion, can only conſtitute an opera ſerious or comic

The muſic of this piece is printed in a ſcore of five ſeparate parts, which are all employed throughout, even in the prologue, which in modern times is uſually a monologue. So that each ſcene is nothing more than a five-part madrigal in action: for though the whole is in meaſure, and in five parts, yet all the characters never appear on the ſtage together, except in the finale, or laſt ſcene. There are excellent wooden cuts at the beginning of every ſcene, by which the number of perſons employed in it, and their principal buſineſs appear.

This drama is neither mentioned by Creſcimbeni, nor in the Drammaturgia; and though Walther gives a liſt of twelve works, which Orazio Vecchi printed between the years 1580 and 1613, the Anfiparnaſo is not included. Nor is it enumerated among this author's works by his ſcholar, our countryman, Peacham. Vecchi ranked very high among the compoſers of his time; and, according to Santarelli, was the firſt who uſed the B *quadro* or ♮, not merely to expreſs the ſound B natural in the diatonic ſcale, to which it had till then been wholly confined; but as a moveable character, applicable to any other ſound that had been altered by a flat or a ſharp, which it has the power of reſtoring to its original pitch in the ſcale.

In the wooden cut preceding the prologue, and ſeveral ſcenes of the piece, as only one figure is repreſented, though the muſic is in five parts, the other four muſt have been ſung behind the ſcenes.

And as there is nothing like a ſolo air, or recitative, in the whole performance, it appears that the drama had not yet got out of the trammels of fugue, imitation, and perpetual chorus; and that ſo much of the church ſtyle was ſtill preſerved as to render modulation equivocal, and the keys difficult to determine by any rules in preſent uſe. The time, too, is as unmarked and doubtful as the modulation; and what little melody there is, by being divided among ſo many parts in diſſimilar motion, loſes its effect, and muſt have rendered the words unintelligible even to the natives of Italy.

As there is no overture to this or any of the firſt muſical dramas, we may ſuppoſe that the prologue ſupplied its place. Indeed, no part for an inſtrument of any kind is printed throughout the piece; conſequently, as there was no orcheſtra, there could be no ſymphonies or ritornels to the ſongs, or rather choruſes, of each ſcene.

Every movement throughout this drama begins in common time, and very ſeldom changes into triple meaſure. There are no bars, or flats and ſharps at the clef. But though it is very ſeldom that any other ſign than that for common time appears, as  , or  ; yet we are convinced that the meaſures muſt frequently have been changed, by agreement, in the performance, to make melody of ſome paſſages practicable; which, though extremely difficult and unmeaning in common time, become eaſy, pleaſing, and expreſſive in triple. And it is not perhaps ſo much from the change of ſtyle and general caſt of the melody, that we have loſt the expreſſion of old muſic, as from our ignorance of the time, not only of the movements, but of the notes themſelves, to which great latitude muſt frequently have been

given in the performance; though the compoſers had not diſcovered the art of exproſſing this latitude by the different characters or technical terms, which have ſince become general.

Vecchi lived in an age when an opportunity for fugue and imitation was irreſiſtible. In ſcenes of dialogue, ſuch contrivances might have been turned to account; but there is little diverſity of ſtyle or movement from the beginning to the end of the piece. The language is in general *Modeneſe*, and not intelligible even to many Italians.

In comparing Vecchi's muſic in five parts with that of Emilio del Cavaliere, Jacopo Peri, Giulio Caccini, and Claudio Monteverde, the legiſlators of dramatic muſic, it appears that Muratori has been guilty of two miſtakes in his account of Orazio Vecchi's muſical comedy: firſt, in ſuppoſing it to have been the earlieſt of the kind that was wholly ſung from the beginning to the end, without any mixture of declamation, as inſtances have been produced of eight anterior pieces of the ſame kind; ſecondly, in imagining that Rinuccini took this drama for a model, as the dramas which Emilio del Cavaliere ſet for Florence, ſo early as the year 1597, offered him an example of a ſpecies of muſic much more dramatic than the madrigal ſtyle of Vecchi, which was preciſely that which Rinuccini and his learned Florentine friend wiſhed to avoid.

When and where the firſt opera buffa was performed, *in ſtilo recitativo*, we have not been able to aſcertain. There was a mixture of comic characters in almoſt all the muſical dramas of the laſt century: however, in 1641, ſoon after the introduction of ſerious operas upon the Venetian ſtage, we find the comic opera of La Finta pazza, written by Claudio Strozzi, and ſet by Sacrati, and La Ninfa avara, written and ſet to muſic by Benedetto Ferrari, in the liſt of the muſical dramas of that year. And among thoſe performed at Rome and Bologna, about the ſame time, though the muſic is not eaſy to find, the words have been preſerved in many collections of poems. The famous opera of Orontea, firſt ſet by Ceſti in 1649, as mentioned elſewhere, was a tragi-comedy; as was the opera of Eriſmena, ſet by Cavalli in 1655, of which alſo an ample account, with ſpecimens of the muſic, have been given. But at this time, air, which was ſcarcely ſeparated from recitative, had not two diſtinct characters, as at preſent, for ſerious and comic purpoſes; for the ſubjects of comic operas, during the laſt century, were ſeldom ſo farcical as thoſe of modern burlettas, and therefore were leſs likely to ſuggeſt ſuch gay, groteſque, and frolickſome meaſures. Tragi-comedies in muſic had a very early admiſſion on the ſtage at Bologna, during the laſt century: as Andromeda Tragicomedia, ſet by Girolamo Giacobbi, maeſtro di capella of S. Petronio, and founder of the academy de' Filomuſi in that city, was performed in 1610, and Amore vuol gioventu, Scherzo drammatico, at Viterbo, 1659; Muſica di Giambatiſta Mariani, 1659. But the only real burlettas, which we have met with, are Girello, Dramma burleſca, ſet by Piſtocchi, 1672, which was repreſented at Venice by little figures of wax; I dui Diogeni, Dramma burleſca per Muſica, and Agrippina in Baja, Scherzo Drammatico per muſica, were both performed at Ferrara, 1687. Indeed, we learn but little of the burletta muſic of Italy, till the comic operas of Latilla, Ciampi, and Galuppi, were performed on our ſtage, of which we ſhall have occaſion to ſpeak elſewhere.

Opera-*Glaſs*, in *Optics*, is ſo called from its uſe in playhouſes, and ſometimes a *diagonal perſpective*, from its conſtruction, which is as follows. A B C D (*Plate* XVI. *Optics, fig.* 21.) repreſents a wooden tube about four inches long; in each ſide of which there is a hole E F and G H, exactly againſt the middle of I K, a plane mirror, which reflects the rays falling upon it to the convex glaſs L M, through which they are refracted to the concave eye-glaſs N O; whence they emerge parallel to the eye at the hole *r s*, in the end of the tube. Let P *a* Q be an object to be viewed, from which proceed the rays P *c*, *a b*, and Q *d*: theſe rays, being reflected by the plane mirror I K, will ſhew the object in the direction *c p*, *b a*, *d q*, in the image *p q*, equal to the object P Q, and as far behind the mirror as the object is before it; the mirror being placed ſo as to make an angle of 45 degrees with the ſides of the tube. And as in viewing near objects it is not neceſſary to magnify them, the focal diſtances of both the glaſſes may be nearly equal; or if that of L M be three inches, and that of N O one inch, the diſtance between them will be but two inches, and the object will be magnified three times, which is ſufficient for the purpoſes to which this glaſs is applied.

If the object be very near, as X Y, it is viewed through a hole *x y*, at the other end of the tube A B, without an eye-glaſs; the upper part of the mirror being poliſhed for that purpoſe, as well as the under. The tube unſcrews near the object-glaſs L M, for taking out and cleanſing the glaſſes and mirrors. The peculiar artifice of this glaſs is to view a perſon at a ſmall diſtance, ſo that no one ſhall know who is obſerved; for the inſtrument points to a different object from that which is viewed, and as there is a hole on each ſide, it is impoſſible to know on which hand the object is ſituated which you are viewing. The poſition of the object will be erect through the concave eye-glaſs. The common opera-glaſs is nothing more than a ſhort Galilean *teleſcope*; which ſee. See alſo Polemoscope.

Operation, in the general, the act of exerting, or exerciſing ſome power, or faculty, upon which an effect follows.

The nobleſt operation of man is that by the ſchoolmen called *vital*, or *immanent*; *viz.* the operation of the mind; which, with regard to the underſtanding, is threefold; apprehenſion or perception, diſcretion or judgment, and reaſoning or diſcourſe.

The direction of theſe makes the object of logic.

With regard to the will, the immanent operations are willing and nilling: to which are referred loving and hating.

Operation, in *Medicine*, denotes a methodical action of the hand on the human body; in order to re-eſtabliſh health.

Bleeding is a very common, but, at the ſame time, a dangerous operation.

Trepanning is one of the fineſt operations in ſurgery.

The Cæſarean operation is the cutting open of a woman with child, and drawing out the child through the aperture.

The other chirurgical operations are ſutures, tapping, caſtrating, cutting for the fiſtula, amputation, extirpation, cupping, &c. See Suture, &c.

Operation, *High* See High and Lithotomy.

Operation, *Lateral*. See Lithotomy.

Operation is more particularly uſed, in *Medicine*, for the means by which any remedy produces its ſalutary effect; or that ſeries of actions, mediate and immediate, by which its remote end is attained.

See the operations of each kind of medicines under the proper heads, Specifics, Purgative, Emetics, Opiates, &c.

Operation, in *Chemiſtry*, denotes the proceſſes, or experiments, by means of which the proper changes are produced in bodies, and the effect of the art procured.

The changes chemiſtry produces in bodies, are reducible

to

to two kinds; *viz.* an union of parts, and a ſeparation of them: thus chemiſtry either ſeparates ſpirits, ſalts, oils, &c. or compounds them together.

A chemical operation, then, conſiſts in changing the ſituation of the parts; particularly, either in moving ſome parts, but not the whole, which is called *ſeparating;* or, in adding new parts, which is called *uniting.*

All chemical operations, therefore, are reducible to two general kinds: *viz.* ſuch whereby the parts of bodies, before joined or united, are ſeparated, which the ancient chemiſts called *ſolution;* and ſuch whereby the parts, before disjoined, are combined or united, called *coagulation.*

Some, however, object digeſtion as a third ſpecies of operation, not reducible to either of them; but Boerhaave ſhews, that it is a compoſition of both.

Moſt chemiſts, however, look on this diviſion as ſcarcely accurate and minute enough, and ſubdivide the art into a number of particular or ſubordinate operations; as calcination, vitrification, diſtillation, ſublimation, cohobation, amalgamation, fermentation, putrefaction, &c.

Operation, in *Theology*, is uſed for the actions, both of the Word and the man, in Jeſus Chriſt. See Person.

The orthodox teach, that there are two operations in Jeſus Chriſt, the one divine, the other human; and not one *theandric* operation, as was the doctrine of the Monothelites and Monophyſites.

OPERATOR, in *Surgery*, &c. a perſon who operates, or works with the hand, on the human body, to preſerve or reſtore its health.

We ſay an *operator for the ſtone*, meaning a lithotomiſt, or a perſon who cuts.

Operator *for the Eyes*, denotes a perſon who couches cataracts, &c.

Operator *for the Teeth*, ſignifies a tooth-drawer, &c. See Teeth.

OPERBANDA, in *Geography*, a town of Bengal; 25 miles N.W. of Nagore.

OPERCULARIA, in *Botany*, a genus of Gærtner's, whoſe name is derived from *operculum*, a lid, becauſe the ſeeds are fixed to the bottom of the lid or covering of the receptacle.—Gærtn. t. 24. Schreb. 65. app. 819. Willd. Sp. Pl. v. 1 563. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 232. Lamarck Dict. v. 4. 560. Illuſtr. t. 58. (Pomax and Rubioides; Soland. MSS.)—Claſs and order. *Tetrandria Monogynia.* Nat. Ord. *Rubiaceæ*, Juſſ.?

Gen. Ch. *Cal.* Common perianth of one leaf, bell-ſhaped, permanent, containing three or ſix flowers, with ſix or nine acute, unequal teeth; proper perianth none. *Cor. univerſal* equal; *proper* of one petal, funnel-ſhaped, with a four or five-toothed, erect mouth. *Stam.* Filaments four, inſerted into the receptacle; anthers diſtinct. *Piſt.* Germen inferior, immerſed in the receptacle; ſtyle thread-ſhaped; ſtigma thickiſh, cloven. *Peric.* none. *Seeds* ſolitary, convex on one ſide, furrowed on the other. *Recept. common* deciduous, flat above, cloſing the aperture of the calyx below the teeth; pyramidal below, furrowed and angular; the angles continued into partitions, by which the cavity of the calyx is divided into as many cells as there are ſeeds.

Eſſ. Ch. Common calyx bell-ſhaped, ſix or nine-toothed, with three or ſix flowers. Partial calyx none. Partial corollas four or five-cleft, equal. Seeds ſolitary, immerſed in the receptacle.

1. O. *umbellata.* Willd. n. 1. Gærtn. t. 24. (Pomax umbellata; Soland. MSS.)—Flowers umbellated, monandrous.—Native of New Holland. *Stem* round, hairy, with oppoſite branches. *Leaves* oppoſite, ſtalked, oblong, hairy on both ſides. *Flowers* terminal, umbellated. This ſpecies is remarkable for having three ſeparate, three-toothed flowers in the diſk; a ſingle ſtamen; and occaſionally two ſtyles.

2. O. *aſpera.* Willd. n. 2. Gærtn. t. 24. Juſſ. Annales de Muſ. v. 4. 427. t. 70. f. 1. (Rubioides aſpera; Soland. MSS.)—Flowers capitate. Calyx furrowed, ſmooth. Native of New South Wales. Introduced at Kew in 1790, by ſir Joſeph Banks, where it flowers in June and July.—*Stems* upright, forked, round, furrowed, ſmooth. *Leaves* oppoſite, ovato-lanceolate, entire, ſmooth, veined. *Flowers* capitate, terminal, drooping.

3. O. *paleata.* Young in Linn. Soc. Tranſ. v. 3. 30. t. 5. Ait. Hort. Kew. ed. 2. v. 1. 232.—Receptacle globular, chaffy.—Native alſo of New South Wales. It flowers at Kew in July and Auguſt. This new ſpecies of *Opercularia* may poſſibly be a diſtinct genus; at leaſt ſuch a ſuſpicion is ſtarted by Dr. Young, who originally deſcribed it, and ſhould that opinion be eſtabliſhed, he propoſes to call it *Cryptoſpermum.* *Root* perennial, fibrous. *Stem* herbaceous, erect, three or four feet high, ſlightly quadrangular, ſmooth, rather ſtriated, branched. *Leaves* oppoſite, ſpreading, ſeſſile, acute, ſometimes pointed, green. *Stipulas* lateral, awl-ſhaped, greeniſh. *Flowers* aggregated, terminal, on longiſh ſtalks, which at firſt are erect, then drooping, and afterwards become erect again. The whole herb has rather a nauſeous ſmell, reſembling decaying pot-herbs.

4. O. *diphylla.* Willd. n. 3. (Rubioides diphylla; Soland. MSS.)—Flowers capitate. Calyx hiſpid.—Native of New Zealand. Very ſimilar to the two firſt ſpecies in habit. Its head of flowers about half the ſize of that of *O. aſpera.*

OPERCULUM, a lid, is excluſively uſed for the finally deciduous covering of the capſules of Moſſes, ſee Musci; which is firmly united to their rim, concealing the ring and fringes, till the ſeeds are ripe. It is itſelf concealed by the *calyptra* or veil, whoſe point is, in a growing ſtate, firmly united with the ſummit or centre of the lid, both together performing, as it appears, the office of a ſtigma. The lid is always more or leſs convex, ſometimes hemiſpherical, with a central boſs, or *umbo*, but more frequently conical or awl-ſhaped, and then either ſtraight or curved. The ſurface is always ſmooth; the colour commonly a little different from that of the capſule. The lid is frequently as long as its capſule, but hardly ever longer. The differences in its ſhape afford excellent ſpecific diſtinctions, but not generic ones.

Operculum, in the *Hiſtory of Shell-fiſh*, denotes the cartilaginous cover with which nature has furniſhed the mouths of the univalve water-ſhells; for as to the land ones, they have only a viſcid liquor to ſupply the place of an operculum.

OPETOPEC, or Mumbacho, in *Geography*, a ſmall but beautiful and fertile iſland of Mexico, with a town of the ſame name, in the S. part of lake Nicaragua.

OPFFERSHAUSEN, a town of Germany, in the county of Henneberg; 7 miles N.W. of Meinungen.

OPHEIM, a town of Norway, in the province of Bergen; 45 miles N.E. of Bergen.

OPHERA, or Opher, in *Scripture Geography*, a town of Judea, in the tribe of Benjamin. Joſh. xviii. 20.

OPHIASIS. See Alopecia.

OPHICARDELON, in *Natural Hiſtory*, the name of a gem mentioned by Pliny, which, he ſays, was a black ſtone covered at top and bottom with white: this ſeems, without doubt, to have been the *camea* of our jewellers.

OPHICEPHALUS, in *Ichthyology*, a genus of fiſhes of

of the order Thoracici; the head is coated with diſſimilar ſcales; body elongated. There are two ſpecies deſcribed by Dr. Shaw.

Species.

PUNCTATUS. Pale beneath, with the head pierced by pores, and the body ſpeckled with black points. It is about ten inches long; the dorſal fin commencing at no great diſtance from the head, and continued nearly to the tail; it is of a moderate breadth, and of a duſky colour ſpotted with black; the anal fin is of a ſimilar ſhape and colour; the tail is rounded; the pectoral fins rounded, and of a moderate ſize; the ventral are ſmaller; the ſcales are rather large; thoſe on the head are diſſimilar; *viz.* on the upper part angular, as in ſnakes; on the ſides ovate or rounded; the lateral line nearly ſtraight. It is a native of India, inhabiting rivers and lakes, and is conſidered as a delicate and wholeſome food.

STRIATUS. The abdomen and fins ſtriated with duſky and whitiſh variegations. It is about twelve inches long. It is a native of India, inhabiting lakes, where it is frequently found much larger than the ſize juſt mentioned; it is in equal eſteem as a food with the former ſpecies, and has been recommended as a proper diet for convaleſcents.

OPHIDIUM, a genus of fiſhes of the order Apodes; the generic character is head nakediſh; teeth both in the jaws and palate; gill-membrane ſeven-rayed; body enſiform. There are four

Species.

* BARBATUM; Bearded Ophidium. Lower jaw with four cirri. It inhabits the Mediterranean and Adriatic ſeas, and is rarely found in the Britiſh; it is from twelve to fourteen inches long; is of a ſilvery-grey colour with linear ſpots; lateral line duſky. The head of this ſpecies is ſmall, without ſcales; the upper jaw is doubled in and longer than the lower; the lips are thick; the teeth are very ſmall; the eyes are covered with a common ſkin, the pupil is black, the iris is golden, with a tranſparent nictitant membrane; the tongue is ſmooth, narrow and ſhort; the back is convex and blueiſh; the lateral line is brown; the vent is nearer the head than the tail; pectoral fins ſmall, brown at the baſe and edged with cinereous, the reſt joined together, narrow, white and edged with black; the ſcales are irregularly placed and diſperſed over the body; they are ſometimes round, ſometimes nearly oval, larger near the head, and hardly diſtinguiſhable near the tail, adhering to the body by means of a thin tranſparent ſkin. It is often taken by nets in Provence and Languedoc, and is moſt common during the ſummer ſeaſon. It feeds on ſmaller fiſhes and crabs.

IMBERBE; Beardleſs Ophidium. Jaws without cirri; tail ſomewhat blunt. It inhabits European ſeas, particularly the Mediterranean. The dorſal, anal, and caudal fins are united.

VIRIDE; Green Ophidium. Jaws without cirri; the tail is a little pointed. It inhabits the deep parts of the Greenland ſeas; is a very rare fiſh, and is often found as large as a whiting; the body is long, compreſſed, green; fleſh eatable.

ACULEATUM; Prickly Ophidium. The generic character is, jaws acuminate. It is deſcribed by Dr. Shaw under the name of O. roſtratum, or ophidium with an extremely long ſharp-pointed ſnout. This is readily diſtinguiſhable from another deſcribed by the ſame author, called the O. maſtacembalus, by the very great elongation of the upper lip, which terminates in a ſharp, ſlender ſnout. The colour of this fiſh is rufous brown above, ſilvery on the ſides and beneath; the dorſal fin is variegated with oblique duſky ſtreaks, and is marked with from two to five round, black ſpots, each ſurrounded by a pale yellowiſh circle.

MASTACEMBALUS; Ophidium with ſharpiſh-pointed equal jaws. This, according to Dr. Shaw, was firſt deſcribed by Dr. Ruſſel in his Natural Hiſtory of Aleppo. It has ſo much the general appearance of an eel, that it is often taken as ſuch by Europeans reſident at Aleppo, and eaten by them for that fiſh. Its uſual length is from a foot to eighteen inches long; the eyes are ſmall, ſituated on each ſide at no great diſtance from the tip of the ſnout; the noſtrils are ſeated at ſome diſtance before the eyes; the whole body is covered with ſmall ſcales, like thoſe of an eel; the colour on the upper parts is a clouded variegation of whitiſh and rufous, the under parts being entirely white; it is principally taken in the river Kowick near Aleppo.

OPHIOBORUS, in *Natural Hiſtory*, a name given by the ancients to a ſpecies of carnivorous fly, which feeds on the bodies of beetles, or other flies, or on the fleſh of dead ſerpents. Its wings are of the colour of poliſhed braſs, whence it was alſo called by the Greeks *chalcomuia*, the *braſs-fly*.

OPHIOGLOSSUM, in *Botany*, from οφις, *a ſerpent*, and γλωσσα, *a tongue*, an ancient name, admirably adapted to the cryptogamic plant, for which Linnæus and all other writers have retained it. Adder's Tongue. Linn. Gen. 559. Schreb. 756. Willd. Sp. Pl. v. 5. 58. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 1106. Ait. Hort. Kew. ed. 1. v. 3. 455. Juſſ. 14. Lamarck Dict. v. 4. 561. Illuſtr. t. 814. Tourn. t. 325. Swartz Syn. Fil. 169. Brown Prod. Nov. Holl. v. 1. 163. —Claſs and order, *Cryptogamia Filices*. Nat. Ord. *Filices Spicatæ*.

Eſſ. Ch. Capſules naked, united into a jointed two-ranked ſpike, each of one cell and two valves, burſting tranſverſely.

Obſ. From this genus are now, with the greateſt propriety, ſeparated ſeveral Linnæan ſpecies, which have a ſcale-like involucrum to each capſule, as well as a ſpurious ring. Theſe conſtitute the *Lygodium* of Swartz, *Ugena* of Cavanilles, and *Hydrogloſſum* of Willdenow. The *Ophioglоſſum ſcandens* and *flexuoſum* of Linnæus and other authors, beautiful climbing ferns, totally unlike in habit to every genuine *Ophioglоſſum*, are among them.

1. O. *vulgatum*. Common Adder's-Tongue. Linn. Sp. Pl. 1518. Engl. Bot. t. 108. Bolt. Fil. t. 3. Fl. Dan. t. 147. Hedw. Theor. 44. t. 4. f. 20—23. (Ophioglоſſum; Fuchſ. Hiſt. 577. Math. Valgr. 543. Camer. Epit. 364. Ger. em. 404.)—Spike from the ſtem. Leaf ovate, obtuſe, cloſely reticulated.—Native of moiſt meadows and paſtures in Europe and North America, producing its ſpike in May. *Root* perennial, of a few thick ſimple fibres. *Herb* not a ſpan high, green and ſmooth in every part, conſiſting of a ſimple round erect *ſtem*, bearing one ovate *leaf*, an inch and half long, which, as Willdenow juſtly obſerves, is reticulated with cloſe, not very obvious, veins. The *ſtem* is terminated by the lanceolate, narrow, compreſſed *ſpike*, which conſiſts of numerous *capſules*, full of minute chaffy ſeeds, and is ſometimes divided. The nature of the flowers, or impregnation, is perhaps as abſolutely in the dark as in any other known plant.

2. O. *ovatum*. Sw. n. 2. (O. ſimplex; Rumph. Amb. v. 6. 152. t. 68. f. 2.)—Spike from the ſtem. Leaf ovate, acute, coarſely reticulated.—Native of the iſle of Bourbon, near the Volcano; alſo of ſhady moiſt graſſy paſtures in Amboina, &c. Much like the laſt, with which moſt people have confounded it, but the above characters may perhaps be

ſufficient to diſtinguiſh them. The point of the *leaf* however varies in acuteneſs.

3. O. *nudicaule*. Linn. Suppl. 443. Swartz Syn. 397. t. 4. f. 2. (O. luſitanicum; Thunb. Prodr. 171.)—Spike radical. Leaf ovate, obtuſe, ſomewhat ſtalked.—Gathered by Thunberg at the Cape of Good Hope. About half the ſize of the two preceding, with a narrower *leaf*, whoſe *ſtalk* is ſcarcely connected with that of the *ſpike*.

4. O. *luſitanicum*. Linn. Sp. Pl. 1518. Lamarck Illuſtr. t. 864. f. 3. (O. anguſtifolium minimum; Barr. Ic. t. 252. f. 2.)—Spike from the ſtem. Leaf lanceolate.—Native of Portugal, Italy, &c. Size of the laſt, but differing eſſentially in the above characters. The *root* creeps, throwing up, here and there, a cluſter of *fronds*.

5. O. *gramineum*. Willd. in Act. Erford. for 1802. 18. t. 1. f. 1.—Spike from the ſtem. Leaf linear-lanceolate, acute, ribleſs.—Gathered by Koenig, in ſtony paſtures on the coaſt of Malabar, in New Holland, by ſir Joſ. Banks. More diminutive than any of the foregoing, being only two inches high, and very ſlender. The *ſpike* is ſcarcely ſurmounted by any point, or barren termination, which moſt of the former have.

6. O. *coſtatum*. Brown n. 2.—Spike from the ſtem. Leaf lanceolate-oblong, ſingle-ribbed, reticulated with veins.—Gathered by Mr. Brown at Port Jackſon, as well as in the tropical part of New Holland. We know it from his publication only.

7. O. *bulboſum*. Michaux Boreali-Amer. v. 2. 276. (O. crotalophoroides; Watt. Carol. 256?)—Spike from the ſtem. Leaf ovate, ſomewhat heart-ſhaped, obtuſe. Root bulbous.—Native of ſandy ground in South Carolina. Rather larger than *O. luſitanicum;* remarkable for its globoſe bulbous *root*. The *ſpike* is pointed.

8. O. *reticulatum*. Linn. Sp. Pl. 1518. Lamarck Illuſtr. t. 864. f. 2. (O. cordatum et reticulatum; Plum. Fil. 141. t. 164.)—Native of the Eaſt and Weſt Indies, not uncommon. This is larger than the *vulgatum*, and readily known by its broad heart-ſhaped, wavy *leaf*, ſtrongly reticulated with numerous veins.

9. O. *pendulum*. Linn. Sp. Pl. 1518. (Scolopendria major; Rumph. Amboin. v. 6. 84. t. 37. f. 3.)—Spike ſtalked, from near the middle of the long linear frond.—Native of woods in Amboina and the iſland of Mauritius, hanging from the branches of old trees. It was alſo found by the late Mr. David Nelſon, on the lofty mountains of Owhyhee, as appears by fine ſpecimens in the Bankſian herbarium. The *roots* conſiſt of long ſmooth fibres, like thoſe of an *Epidendrum* or *Dendrobium*. *Fronds* ſeveral, pendulous, twelve or eighteen inches long, linear, ſtrap-like, ſmooth, entire, tapering at each end, rarely cloven. *Spike* nearer the baſe than the extremity of the centre of each frond, ſolitary, ſtalked, two or three inches long, compoſed of very numerous crowded *capſules*, and generally tipped with a ſmall point.

10. O. *palmatum*. Linn. Sp. Pl. 1518. Plum. Fil. 139. t. 163.—Spikes ſeveral, lateral, ſtalked, from the wedge-ſhaped baſe of the palmate frond.—Native of Hiſpaniola, where it was found, in one ſpot only, by Plumier. We have ſpecimens from more recent French travellers. This is the largeſt known ſpecies of its genus. The fibres of the *root* are divided. *Fronds* erect, ſmooth, two feet high, each with a round *ſtalk*, a little hairy at its baſe; the *leaf* wedge-ſhaped at the lower part, where, from its edges, ſpring on each ſide three or four ſtalked drooping *ſpikes*, like thoſe of *O. pendulum*, except in being marginal. The upper part is deeply palmate, ſcarcely ribbed or veined, wavy, but entire.

OPHIOMANCY, οφιομαντεια, compounded of οφις, *a ſerpent*, and μαντεια, *divination*. in *Antiquity*, the art of making predictions from ſerpents. Thus Calchas, on ſeeing a ſerpent devour eight ſparrows with their dam, foretold the duration of the ſiege of Troy. And the ſeven quoils of a ſerpent that was ſeen on Anchiſes's tomb, were interpreted to mean the ſeven years that Æneas wandered from place to place before he arrived in Latium. Thus, Virgil, Æn. lib. v. ver. 85.

"Septem enim gyros, ſeptena volumina traxit."

OPHIOMORPHITES, in *Natural Hiſtory*, the name given by ſome authors to the foſſils called more uſually cornu ammonis; which are compoſed of ſeveral wreaths, rolled in a ſpiral form over one another, and reſemble a ſnake when rolled up. Theſe are found of prodigious ſizes, ſome not leſs than the fore-wheel of a chariot. They are evidently formed from ſome ſea-ſhell, the ſhelly matter remaining on ſome of them, and all being compoſed of ſeveral cells, communicating with one another by means of a ſiphunculus, in the manner of thoſe of the nautilus.

OPHIOPHAGI, a name given by ſome to the eagle, vulture, and ſome other birds of prey which are ſometimes ſeen to feed on ſerpents.

Pliny gives the name ophiophagi to a certain people of Æthiopia, whom he deſcribes as very barbarous and ſavage, going always naked, and feeding on ſerpents, whence the appellation. Solinus, who generally copies Pliny but imperfectly, has perverted his meaning ſtrangely in this paſſage, having placed the ophiophagi in Arabia Felix, inſtead of Æthiopia.

OPHIORRHIZA, in *Botany*, a Linnæan genus, whoſe name is derived from οφις, *a ſerpent*, and ριζα, *a root*, becauſe the plant, ſays Hermann, is regarded in Ceylon as a grand ſpecific for the bite of the Nagha, or Ribband Snake. This genus was originally called *Mitreola* by Linnæus, being the *Mitra* of Houſton. (See MITREOLA.) Linn. Fl. Zeylan. 190, and 239. Gen. 85. Schreb. 111. Willd. Sp. Pl. v. 1. 826. Mart. Mill. Dict. v. 3. Michaux. Boreal-Amer. v. 1. 148. Juſſ. 143. Lamarck Dict. v. 4. 563. Illuſtr. t. 107. Gærtn. t. 55. Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Stellatæ*, Linn. *Gentianæ*, Juſſ.

Gen. Ch. *Cal.* inferior, of one leaf, erect, compreſſed, five-toothed, equal, permanent. *Cor.* of one petal, funnel-ſhaped, tube inflated at the baſe; throat almoſt cloſed with hairs; limb five-cleft, obtuſe, ſpreading. *Stam.* Filaments five, thread-ſhaped, very ſhort, inſerted into the tube; anthers oblong, the length of the tube. *Piſt.* Germen ſuperior, cloven; ſtyle thread-ſhaped, as long as the ſtamens, thicker upwards; ſtigmas two, obtuſe. *Peric.* Capſule broad, rather obtuſe, divided into two, oblong, divaricated lobes, of two cells, burſting inwardly; the partition contrary. *Seeds* numerous, angulated, fixed round an oblong, ſtalked receptacle, looſe in the middle of each cell.

Eſſ. Ch. Corolla funnel-ſhaped. Germen cloven. Stigmas two. Capſule two-lobed.

1. O. *Mungos*. Linn. Sp. Pl. 213. Mat. Med. 59. t. 1. Plenck. t. 90.—Leaves lanceolate-ovate.—Native of the Eaſt Indies. *Stem* ſimple. *Leaves* oppoſite, ſtalked, entire, ſmooth, with obliquely tranſverſe nerves. *Flower-ſtalk* terminating the ſtem with a corymb of ſimple or cloven *ſpikes*, diſpoſed in an umbellate manner from one centre, and ſpreading. *Flowers* ſeſſile, from the upper ſide of the horizontal ſpike.

2. O. *Mitreola*. Linn. Sp. Pl. 213. Swartz. Obſ. 59. t. 3. f. 2. (Mitreola; Hort. Cliff. 492.)—Leaves ovate.—Native

—Native of damp, graſſy places, near the banks of rivers in Jamaica, flowering in the ſpring.—*Roots* from the lower joints of the ſtem, crowded, long, thread-ſhaped, white. *Stem* herbaceous, a foot high, ſimple or branched, erect, ſquare below, roundiſh above, rather weak. *Leaves* oppoſite, ſtalked, pointed, ſmooth on both ſides. *Flower-ſtalks* terminal, forked, lax. *Flowers* in ſpikes, ſeſſile, all turned one way, ſeparate, white; a ſolitary flower at the forked diviſion of the flower-ſtalk.

In Swartz's figure above quoted, the engraver by miſtake has ſubſtituted the wrong name for each of the plants delineated. Fig. 1. is *Macrocnemum jamaicenſe*, and fig. 2. is *Ophiorrhiza Mitreola*.

3. O. *ſubumbellata*. Willd. n. 3. Forſt. Prodr. Fl. Auſtr. n. 66.—Stem ſhrubby. Leaves lanceolate, acute. Umbels axillary, three-cleft.—Native of Otaheite.—This ſpecies is only known from the above quoted authors.

OPHIOXYLUM, Serpentine Wood, derived from ὀφις and ξυλον, becauſe its root ſpreads in a zigzag manner like the twiſting of a ſerpent. Linn. Fl. Zeylan. 188. Gen. 539. Schreb. 725. Willd. Sp. Pl. v. 4. 979. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 433. Juſſ. 149. Lamarck Dict. v. 4. 565. Illuſtr. t. 842. Gærtn. t. 109.—Claſs and order, *Polygamia Monoecia*, or rather *Pentandria Monogynia*. Nat. Ord. *Apocineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, five-cleft, ſometimes bifid, acute, erect, very ſmall. *Cor.* of one petal, funnel-ſhaped; tube long, thread-ſhaped, thickened in the middle; limb five-cleft, ſpreading. Nectary uncertain, or only found in imperfect flowers, at the mouth of the corolla, cylindrical, entire. *Stam.* Filaments five, very ſhort, in the middle of the tube, ſometimes only two; anthers pointed. *Piſt.* Germen ſuperior, roundiſh; ſtyle thread-ſhaped, the length of the ſtamens; ſtigma capitate. *Peric.* Berry twin, two-celled. *Seeds* ſolitary, roundiſh.

Eſſ. Ch. Calyx five-cleft. Corolla five-cleft, funnel-ſhaped. Stamens five. Piſtil one.

1. O. *ſerpentinum*. Three-leaved Ophioxylum. Linn. Sp. Pl. 1478. Jacq. Hort. Schoenbr. t. 389. Curt. Mag. t. 784. (Liguſtrum foliis ad ſingula internodia ternis; Burman. Zeylan. 141. t. 64.)—Native of the Eaſt Indies. It was cultivated at Hampton Court in 1690, and flowers in May and June. *Stem* erect, round, quite ſimple. *Leaves* generally in fours, ſtalked, lanceolato-ovate, pointed, ſmooth. *Flowers* glomerate, terminal, white with a red tube; occaſionally imperfect, when they have a nectary like that of *Narciſſus*. *Berry* large and fleſhy, two-lobed, of a brick red. Gærtner calls this ſpecies *trifoliatum*, and ſays that, although the deſcription given by Rumphius in his Herb. Amboin. v. 7. 30, belongs undoubtedly to this plant, yet that his figure muſt be another ſpecies, for that it has oppoſite, cruciate *leaves*, white *flowers* and black *berries*. Gærtner propoſes to call it *O. alba*, but his opinion ſeems founded in error. The *Lignum Colubrinum* is ſuppoſed to be the root of this plant. Its ſerpentine form perhaps gave it the reputation of curing the bites of ſnakes, which it hardly retains at preſent.

Ophioxylum, in *Gardening*, contains a plant of the ſhrubby climbing kind, of which the ſpecies is the ſcarlet-flowered ophioxylum (O. ſerpentinum.)

*Method of Culture.*—This may be raiſed by ſeeds, which ſhould be ſown in pots in the early ſpring and be plunged in a bark hot-bed, and when the plants have obtained ſome growth, removed into ſeparate pots and replunged in the bark hot-bed of the ſtove, where the plants muſt be conſtantly kept. It may likewiſe be increaſed by layers and cuttings, which ſhould be laid down or planted out at the ſame ſeaſon, and have the ſame ſort of management as thoſe procured from ſeeds.

Theſe are ornamental ſtove plants.

OPHIR, in *Sacred Geography*, the place from which Solomon procured the gold and other precious articles with which he enriched himſelf, and adorned the temple of Jeruſalem.

Concerning the part of the world in which Ophir was ſituated, there have been many and various opinions and conjectures; ſome of them extremely fanciful, not to ſay abſurd; and others ſupported and elucidated with no inconſiderable portion of ingenuity and learning: ſtill, however, the exact ſituation of this place is undetermined, though the opinion that it was ſomewhere either on the eaſtern or weſtern coaſt of Africa ſeems the moſt plauſible, and to obtain the ſanction of the moſt learned and well-informed writers, who have diſcuſſed or adverted to this point of ſacred geography.

Before proceeding to notice and explain the various hypotheſes reſpecting the ſituation of Ophir, it may be proper to collect the different paſſages in ſcripture in which it is mentioned.

1 Kings, ix. 26, 27, 28. And king Solomon made a navy of ſhips in Ezion-geber, which is beſide Eloth, on the ſhore of the Red ſea, in the land of Edom.

And Hiram ſent in the navy his ſervants, ſhipmen that had knowledge of the ſea, with the ſervants of Solomon.

And they came to Ophir, and fetched from thence gold, four hundred and twenty talents, and brought it to king Solomon.

1 Kings, x. 11. And the navy alſo of Hiram, that brought gold from Ophir, brought in from Ophir great plenty of almug-trees, and precious ſtones.

Verſe 22. For the king had at ſea a navy of Tharſhiſh with the navy of Hiram; once in three years came the navy of Tharſhiſh, bringing gold and ſilver, ivory, and apes, and peacocks.

2 Chron. viii. 17, 18. Then went Solomon to Ezion-geber, and to Eloth, at the ſea-ſide in the land of Edom.

And Huram ſent him by the hands of his ſervants ſhips, and ſervants that had knowledge of the ſea; and they went with the ſervants of Solomon to Ophir, and took thence four hundred and fifty talents of gold, and brought them to king Solomon.

Chap. ix. 10. And the ſervants alſo of Huram, and the ſervants of Solomon, which brought gold from Ophir, brought algum-trees, and precious ſtones.

Verſe 21. For the king's ſhips went to Tharſhiſh with the ſervants of Huram; every three years once came the ſhips of Tarſhiſh bringing gold and ſilver, ivory, and apes, and peacocks.

1 Kings, xxii. 48. Jehoſhaphat made ſhips of Tharſhiſh to go to Ophir for gold; but they went not; for the ſhips were broken at Ezion-geber.

2 Chron. xx. 35, 36, 37. And after this did Jehoſhaphat, king of Judah, join himſelf with Ahaziah, king of Iſrael, who did very wickedly.

And he joined himſelf with him to make ſhips to go to Tharſhiſh; and they made the ſhips in Ezion-geber.

Then Eliezer, the ſon of Dodavah of Mareſhaſh, propheſied againſt Jehoſhaphat, ſaying, becauſe thou haſt joined thyſelf with Ahaziah, the Lord hath broken thy works. And the ſhips were broken, that they were not able to go to Tharſhiſh.

The authors of the Ancient Univerſal Hiſtory conſider the various marks by which the ſcriptures ſeem to lead us to Ophir, as ſo palpable and ſtriking, that they are ſur-

priſed the diſcovery of its ſituation ſhould be ſo very difficult, and have given riſe to ſo much diſcuſſion and controverſy: theſe marks they thus claſs and enumerate: 1. That Moſes ſpeaks of Ophir, the ſon of Joktan, who went with his brethren, and dwelt from Meſha, toward Sephar, a mount of the Eaſt. (Gen. x. 29, 30.) 2. That the ſame fleet went both to Ophir and Tharſhiſh, and ſet out from Ezion-geber, a ſea-port near Eloth, in the land of Edom, upon the Red ſea. 3. That the voyage took them up three years. 4. That it brought gold, precious ſtones, ſpices, ivory, ebony, almug-wood, peacocks, and monkies. 5. That Ophir not only afforded the greateſt quantity of gold, but that it alſo exceeded all other gold in fineneſs and value. To theſe marks of the ſituation of Ophir, ſupplied by ſcripture, they add that, according to Eupolemus, an ancient author, quoted by Euſebius, the Urphe, or Ophir, from whence this gold was brought, was an iſland in the Red ſea; not that ſea, which is commonly underſtood by that appellation, which lies between Arabia and Egypt, but the great Southern ocean, which extends between India and Africa, and waſhes up to the coaſt of Arabia and Perſia, and which was called the Red ſea, from the colour which the perpendicular ſun-beams gave it in thoſe hot climates. Ancient Univerſal Hiſtory, vol. iv. p. 102. note R.

Now it appears to us, that in theſe obſervations there are ſeveral circumſtances taken for granted, which are by no means warranted by the authority of thoſe paſſages in ſcripture, which we have quoted, as containing all the information reſpecting Ophir which the holy writings afford us: and as all the hypotheſes reſpecting the ſituation of this place proceed on the truth of theſe circumſtances, it may be proper to examine into it with ſome degree of caution and attention.

In the firſt place, the paſſages in ſcripture by no means warrant the opinion, that the ſame veſſels which made a voyage to Ophir, at the ſame time went to Tharſhiſh; and that theſe two places lay nearly in the ſame direction, and therefore muſt be ſought for, either in the ſame, or an adjoining country; or, at leaſt, in the courſe of the voyage which the ſhips of Solomon and of Hiram made. An examination and compariſon of the paſſages from Kings and the Chronicles, which we have quoted, will ſufficiently prove that there is no foundation for this opinion: the utmoſt they can be ſaid to prove is, that Solomon ſent ſhips to Tharſhiſh as well as to Ophir; and the words in 1 Kings, x. 21: for the king had at ſea a navy of Tharſhiſh, with the navy of Hiram, ſeem to indicate that there were two diſtinct fleets ſent out on two diſtinct voyages. It may alſo be remarked, that if the ſame fleet went at the ſame time to Ophir and Tharſhiſh, the commodities brought from theſe places could not have been ſo clearly diſtinguiſhed as they are, nor would the fleet have been called, as it is excluſively, the navy of Tharſhiſh.

But, in the ſecond place, there ſeems good reaſon for doubting whether Solomon ſent ſhips to Tharſhiſh, or if he did, whether Tharſhiſh was not very near Judea, and merely a depôt for the merchandize of more diſtant countries, which was brought there by the veſſels of that place. This opinion, though attended with ſome difficulties, and oppoſed by ſome paſſages in ſcripture, is evidently and directly ſupported by other paſſages, and is more conſonant with what we know, from other ſources, reſpecting Tharſhiſh.

By the expreſſion employed 1 Kings, x. 22: for the king had at ſea a navy of Tharſhiſh, it is more reaſonable to underſtand that this navy was either hired from Tharſhiſh by Solomon, or was compoſed of ſhips built after the manner of the ſhips of that place, than that it was a fleet which had ſailed for Tharſhiſh: the firſt of theſe ſuppoſitions is ſupported by the context, the navy of Tharſhiſh being mentioned immediately in connection with the navy of Hiram, which ſeems to imply, that as the latter was lent to Solomon by that monarch, the former was procured from Tharſhiſh. The other idea, that by the navy of Tharſhiſh is meant, ſhips built after the manner of the ſhips of Tharſhiſh, is countenanced by the paſſage in 1 Kings, xxii. 48. Jehoſhaphat made ſhips of Tharſhiſh to go to Ophir for gold. At any rate, theſe paſſages are directly againſt the opinion, that Tharſhiſh was a very diſtant place, which was viſited by the ſhips of Solomon at the ſame time that they went to Ophir.

There are, however, two paſſages which favour the opinion that Solomon and Jehoſhaphat ſent ſhips to Tharſhiſh, though they by no means prove the great diſtance of this place, nor that it was viſited at the ſame time with Ophir. In the paſſage of Chronicles, which correſponds with 1 Kings, x. 22, the navy of Solomon, inſtead of being called the navy of Tharſhiſh, as in the latter paſſage, is ſaid to have gone to Tharſhiſh, with the ſervants of Huram: and in 2 Chron. xx. 36, which correſponds with 1 Kings, xxii. 48, Jehoſhaphat is ſaid to have joined himſelf with Ahaziah, king of Iſrael, to make ſhips to go to Tharſhiſh, and not, as in the paſſage of Kings, to make ſhips of Tharſhiſh to go to Ophir for gold.

As theſe paſſages ſeem not to accord very well together, and conſequently cannot be brought forward of themſelves abſolutely to determine whether Tharſhiſh were a diſtant country, viſited by Solomon's ſhips, at the ſame time that they made their voyage to Ophir; or whether Solomon merely hired veſſels from Tharſhiſh, a neighbouring city or territory, or built his own veſſels on the model uſed here, it will be neceſſary to examine other paſſages, in which Tharſhiſh is mentioned. It may fairly be inferred, that as the Tharſhiſh ſpoken of, in the paſſages already quoted, is not particularized by any epithet, or circumſtance, to diſtinguiſh it from the Tharſhiſh mentioned repeatedly in other parts of ſcripture, that it is the ſame place; certainly, if it had been a very diſtant and comparatively unknown place, it would have been ſo diſtinguiſhed from the Tharſhiſh that was familiar to the Jews.

Tharſhiſh was the ſon of Javan, and according to the opinion of Joſephus, his deſcendants firſt peopled Cilicia, whence the whole country, as well as the city of Tarſis, took its name. That this place was celebrated for its ſhips and commerce, and that it was viſited by the Jews, the following paſſages, beſides others, will ſufficiently prove. In the 27th chapter of Ezekiel, where the prophet foretells the deſtruction of Tyre, he expreſsly mentions Tharſhiſh as one of the places which traded with that city: ver. 12. Tharſhiſh was thy merchant, by reaſon of the multitude of all kinds of riches; ver. 25. The ſhips of Tharſhiſh did ſing of thee in thy market. And that this Tharſhiſh, thus celebrated for its ſhips and commerce, was at no great diſtance from Tyre, appears from the 23d chapter of Iſaiah, ver. 6. where the prophet is alſo foretelling the miſerable overthrow of Tyre, "Paſs ye over to Tharſhiſh; howl, ye inhabitants of the iſle." In the firſt verſe of the ſame chapter alſo, the connection and intercourſe of Tharſhiſh with Tyre is pointed out, in theſe words, "Howl, ye ſhips of Tharſhiſh, for it (Tyre) is laid waſte." But the vicinity of Tharſhiſh, and the intercourſe with it, are ſtill more clearly pointed out in the ſecond verſe of the firſt chapter of Jonah; "But Jonah roſe up to flee unto Tharſhiſh from

the preſence of the Lord, and went down to Joppa; and he found a ſhip going to Tharſhiſh: ſo he paid the fare thereof, and went down into it, to go with them unto Tharſhiſh, from the preſence of the Lord."

It ſeems, therefore, fair to conclude, that the Tharſhiſh mentioned in the paſſages cited from Kings and the Chronicles, is the ſame place, known under that name, in other parts of ſcripture: it evidently was a place of great commerce, and famous for its ſhips; and though it may be granted that Solomon and Jehoſhaphat traded with Tharſhiſh, and did not merely hire veſſels from the merchants there, or build them after the models of that place, (though, as we have ſeen, there are paſſages in ſcripture which countenance theſe opinions), yet there is certainly no evidence that the fleet which viſited Ophir, at the ſame time viſited Tharſhiſh, or that the voyage to theſe places lay in the ſame track.

In the laſt place, the marks reſpecting the ſituation of Ophir, drawn from the ſuppoſed length of the voyage, are equally unſupported by the paſſages quoted from ſcripture. Even allowing that the navy of Solomon was three years on its voyage to Tharſhiſh, this circumſtance would not ſerve as a guide to aſcertain the poſition of Ophir, unleſs it had been proved that the voyage to the two places was performed at the ſame time; and we have ſhewn that there is no ground for this opinion. But as the alleged length of the voyage to Tharſhiſh may ſeem to militate againſt the idea, which we have thrown out, that this place was in Cilicia, and that, if reſorted to by Solomon's ſhips, it was reſorted to only as a depôt for merchandize, not as the native country of the commodities brought from it, it will be proper to examine on what authority it has been ſo generally maintained, or rather taken for granted, that the voyage to Tharſhiſh occupied the ſpace of three years. The paſſages have been already given, but it will not be amiſs to quote them again. 1 Kings, x. 22: for the king had at ſea a navy of Tharſhiſh with the navy of Hiram: once in three years came the navy of Tharſhiſh, bringing gold and ſilver, ivory, and apes, and peacocks. 2 Chron. ix. 21: for the king's ſhips went to Tharſhiſh with the ſervants of Huram; every three years once came the ſhips of Tharſhiſh, bringing gold and ſilver, ivory, and apes, and peacocks. Now, certainly, to read theſe paſſages with the eye of common ſenſe, without attachment to, or knowledge of, any hypotheſis on the ſubject, the ſum of the inferences that could reaſonably be drawn from them would ſimply amount to this; that Solomon had a ſupply of the commodities mentioned in them, once in three years; there is no aſſertion made, no intimation given, no reaſon ſupplied for drawing the inference, that the voyage to Tharſhiſh occupied three years. This interpretation of theſe paſſages, ſo plain, obvious, and conſiſtent in itſelf, muſt derive conſiderable ſupport from the facts, that Tharſhiſh is frequently mentioned in other parts of ſcripture, as at a ſhort diſtance from Judea, as famous for its ſhipping and commerce, and as having kept up a direct and frequent intercourſe with Joppa, one of the principal ſea-ports of Hiram, from whom Solomon received one of his fleets, or at leaſt, ſeamen to navigate it on its voyage to Ophir. The general concluſions, therefore, which we ſhould be diſpoſed to draw, are, that whatever may have been the diſtance and ſituation of Ophir, they ought not to be ſought after on the idea that this place and Tharſhiſh lay in the ſame route, and were viſited on the ſame voyage; nor that the voyage occupied ſo long a period as three years; and that, in order to procure gold and the other commodities enumerated in the paſſages cited, Solomon ſent directly to Ophir, in his own ſhips, in thoſe of his friend and ally, Hiram, king of Tyre, or in the ſhips of Tharſhiſh, which he probably procured through Hiram, who had regular and extenſive commercial intercourſe with that place; while, at the ſame time, Solomon traded directly with Tharſhiſh, one of the principal depôts for the merchandize in the Mediterranean.

Having thus thrown out our own ideas on one point of this queſtion, we ſhould now proceed to ſtate the various hypotheſes reſpecting the ſituation of Ophir; all of which it will be ſeen proceed on the aſſumptions, that Tharſhiſh lay on the ſame route with it, was viſited at the ſame time, and that the voyage occupied a ſpace of three years: but it may be proper to premiſe ſome miſcellaneous obſervations, which will clear the way for the more accurate and ſatisfactory ſtatement of theſe hypotheſes.

Ophir muſt have been viſited long before the time of Solomon; ſince the gold of Ophir is particularly mentioned in the book of Job, chapter xxii. verſe 24. "Then ſhalt thou lay up gold as duſt, and the gold of Ophir as the ſtones of the brooks;" or, as it is otherwiſe tranſlated, "Then ſhalt thou lay up gold as duſt, and wealth as in the brooks of Ophir," and in the 45th Pſalm, verſe 9, "Kings' daughters were among thy honourable women: upon thy right hand did ſtand the queen in gold of Ophir." That the gold of Ophir was in great plenty in Judea, in king David's time, appears from this circumſtance, that he left 3000 talents of it for the ſervice of the temple, beſides the 5000 talents which the princes of the people offered for the ſame purpoſe. (1 Chronicles, xxix. 4, &c.) And, as the authors of the Ancient Univerſal Hiſtory remark, we can hardly believe, that either David or the princes gave more than a certain proportion of it; ſuppoſing that it was a third part of all they poſſeſſed, there muſt have been at leaſt 24,000 talents of that metal in the kingdom. On this head, it may be remarked, that the Talmud reckons ſeven kinds of gold, of which the gold of Ophir was the moſt celebrated, and the moſt abundant. Tract. Joma, fol. xliv. p. 2.

Although the ſituation of Ezion-geber ſeems plainly and ſatisfactorily pointed out, yet ſome authors are of opinion, that it was not a port on the Red ſea, but on the Mediterranean: this opinion they ſeem to have embraced, in order to avoid the difficulty which puzzled Huet, and which led him to maintain, that the canal of communication between the Red ſea and the Mediterranean was opened in king David's time. It is certain, that in the time of Solomon there was ſome mode of communication, by means of ſhips, between Ezion-geber and the Mediterranean; for even allowing that Tarſhiſh was on the eaſt coaſt of Africa, and, therefore, could be reached by veſſels from the Red ſea, without the neceſſity of going round Africa, yet it is not eaſy to imagine by what means Hiram ſent the veſſels, with which he accommodated Solomon, from Phœnicia to the Red ſea, unleſs we ſuppoſe, with Huet, that there was at that time a canal between the two ſeas. (2 Chron. viii. 18.) But whatever difficulty there may be in finding a paſſage from Ezion-geber to the Mediterranean, that place cannot have been ſituated any where, except on the Red ſea, as there is not a ſingle paſſage in ſcripture in which Yam ſuph ſignifies the Mediterranean, or any other but the Red ſea. Indeed, there is good reaſon for believing that by Yam ſuph, the Heeropolitan gulf, or upper part of the Red ſea, was particularly deſignated. (Ancient Univerſal Hiſtory, vol. xviii. p. 366. note M.) Beſides, Ezion-geber is expreſsly ſaid to have been near Eloth, and this city is always placed on the Red ſea.

The almug-trees, which were part of the cargo brought from

from Ophir, are called by the rabbins coral wood, and are ſaid to have reſembled coral in hardneſs, colour, and poliſh; by Lemery, it is ſaid to have been a ſpecies of wood which he calls grenadille.

The firſt hypotheſis reſpecting the ſcite of Ophir, which we ſhall notice, places it in Peru; this opinion is maintained by the rabbi David Ganz, and by ſeveral other authors, mentioned in the Ancient Univerſal Hiſtory, vol. iv. p. 102. n. R. The grounds on which this opinion is reſted are extremely fanciful, independently of the extreme improbability, that in the time of Solomon any knowledge exiſted of America, much leſs any intercourſe with it. The gold of Ophir ſeems, 2 Chron. iii. 6. to be called the gold of Parvaim; for ſpeaking of the ornaments of the temple, which in other places are ſaid to have been of the gold of Ophir, Solomon, in this paſſage, is ſaid to have garniſhed the houſe with precious ſtones for beauty, and the gold was the gold of Parvaim. On this idea, that the gold of Ophir and of Parvaim were the ſame, and that, conſequently, theſe were two names for the ſame place, the opinion that Ophir was in Peru has been principally founded; Parvaim being ſuppoſed to bear ſome reſemblance in ſound, and in letters, to Peru. It is hardly neceſſary to expoſe the abſurd futility of this fancied reſemblance. Another mode of ſupporting this hypotheſis is equally ridiculous, *viz.* that the Hebrew word Ophir, and Peru expreſſed in Hebrew letters, are compoſed of the ſame letters, though differently arranged. On this hypotheſis it is not worth while to waſte any more time, except merely to remark, that according to ſir Walter Raleigh, Peru is not the true name of that country, but was given it by the Spaniards, in conſequence of their miſtaking the anſwer of the natives to a queſtion they did not underſtand: the Spaniards aſking them what country, the Indians anſwered Peru, or Beru, what do you ſay; hence the Spaniards concluded, that Peru was the name of the country.

Joſephus and others, having obſerved that the ſhips ſailed from the Red ſea, place Ophir in the Indian ocean, and ſuppoſe it to be the ancient Taprobana, or the Cherſoneſus Aurea, the land of gold. If it were Taprobana, it muſt have been the iſland of Ceylon, for there is good reaſon for ſuppoſing, that that iſland was known to the ancients by the name of Taprobana. The Aurea Cherſoneſus probably was the peninſula of Malacca. But there are ſeveral weighty objections to this hypotheſis: in the firſt place, the name of Ophir has no affinity to any of theſe iſlands, though Parvaim is ſuppoſed to reſemble Taprobana in ſound; a ſuppoſition which only ſhews on what ſlender grounds hypotheſes are frequently built. But in the ſecond place, if Ophir had been ſituated any where on the Indian ſeas, the gold and merchandiſe for which it was famous would not have been brought by ſea, but by caravans, by means of which all the Aſiatic commodities were introduced into the countries bordering on the Mediterranean, before the diſcovery of the Cape of Good Hope.

The authors of the Ancient Univerſal Hiſtory are diſpoſed to place Ophir "in ſome of thoſe remote rich countries in India, beyond the Ganges, and perhaps as far as China or Japan, which laſt ſtill abounds with the fineſt gold, and with ſeveral other commodities in which Solomon's fleet dealt, as ſilver, precious ſtones, ebony, and other valuable ſorts of wood, to ſay nothing of ſpices, peacocks, parrots, apes, and other ſuch creatures; and by its diſtance, beſt anſwers to the length of the voyage." (Ancient Univerſal Hiſtory, loc. cit.) But the objections already urged againſt the laſt hypotheſis, lie with equal weight againſt this opinion: it is not likely, that in Solomon's time ſuch a diſtant voyage could have been undertaken, in the courſe of which, the only ſecure and uſual manner of navigation practiſed among the ancients, *viz.* ſailing along the coaſt, could not here have been practiſed; and long before the period and direction of the monſoons, which in after ages were taken advantage of in order to ſail acroſs from the Red ſea to the coaſt of Malabar, were aſcertained. If the commodities obtained by Solomon actually came from the diſtant parts of India, they muſt, as has been already obſerved, have been brought by caravans. The paſſage in Geneſis has been already mentioned, in which Moſes informs us, that the habitation of Joktan's ſons was from Meſha, as thou goeſt unto Sephar, a mount of the eaſt. As Ophir was one of Joktan's ſons, a hypotheſis reſpecting the ſituation of Ophir has been built on this paſſage; this hypotheſis is principally ſupported by Calmet; he ſuppoſes it was placed ſomewhere towards Armenia and Media, where the Tigris and Euphrates take their riſe; and theſe rivers, he thinks, might have been ſubſervient to the commerce which was carried on. Calmet argues in favour and ſupport of this hypotheſis with conſiderable ingenuity and learning; but it certainly does not reſt on any ſolid foundation. If Ophir were ſituated near the riſe of the Tigris or Euphrates, the veſſels of Solomon could hardly have reached it; and if the merchandiſe were brought down to the ſhips at the mouth of theſe rivers, it would not have been ſaid that they ſailed to Ophir. As the commonly received opinion, that the voyage to Ophir occupied a ſpace of three years, militates againſt the hypotheſis, that it was ſituated ſo near to Judea, as Armenia or Media, Calmet ſuppoſes, that the three years mentioned in the text might mean only three ſummers, and two winters, or thirty months.

Dean Prideaux offers his conjectures, on the ſuppoſition, that it was the voyage to Tharſhiſh only, and not the voyage to Ophir, or to Ophir and Tharſhiſh together, which took up three years going and coming; hence he concludes, that Ophir might be much nearer Judea than Tharſhiſh, and that the voyage to it might have been performed in a much ſhorter ſpace of time than three years, if they had not been obliged to go to Tharſhiſh for ſome commodities, with which Ophir could not ſupply them; hence he infers, that any place in the Great Indian ſea, at the diſtance of three years' voyage, which yielded gold, ſilver, ivory, apes, and peacocks, might be the Tharſhiſh; and any other, though much nearer, where they could have gold, almug-trees, and precious ſtones, might be the Ophir mentioned by the ſcriptures; and he attempts to ſhew, that the ſouthern part of Arabia produced the greateſt quantities of the beſt gold, and, conſequently, might be the land of Ophir. Againſt this hypotheſis, the objection already ſtated lies with great force. As a conſtant commercial intercourſe was kept up between India and the more diſtant parts of Aſia, and the countries on the Mediterranean, by means of caravans, it is by no means probable, that veſſels could be employed for this purpoſe; hence, wherever Ophir may have been ſituated, it ought not to be ſought for in the Indian ocean, or in any part of Aſia.

Againſt this opinion of dean Prideaux, the remarks of the authors of the Ancient Univerſal Hiſtory alſo ſtrongly militate. "Though it be granted (they obſerve) that Tharſhiſh and Ophir might be diſtinct places, and at ſome conſiderable diſtance from each other; yet, if the latter had been ſo nigh as South Arabia, and had yielded ſuch plenty of the fineſt gold, almug-trees, and precious ſtones, it is ſcarcely probable, that they would have gone ſo much farther for ſuch inferior trifles as ſilver, ivory, monkies, and peacocks; it is more likely that they went fartheſt for the fine gold, precious

cious ſtones, and things of the greateſt value." Ancient Univerſal Hiſtory, vol. iv. p. 105. note R.

Having thus conſidered the various hypotheſes, which proceed on the idea, that Ophir was ſituated either in South America, or the continent of Aſia, or in ſome of the Aſiatic iſlands, and proved how little foundation there is for any of them, even on the ſuppoſition that Ophir and Tharſhiſh were viſited on the ſame voyage; that Tharſhiſh was not the Tharſhiſh of Cilicia, but a much more diſtant and leſs known place; and that the ſpace of three years was occupied in the voyage to Ophir and Tharſhiſh; we ſhall now proceed to ſtate, and conſider that claſs of hypotheſes, which look for theſe places either in Africa alone, or in Africa and Europe.

The opinion that Ophir was Sofala, a territory or town of Africa, oppoſite to the iſland of Madagaſcar, has been long held, as we learn from Bochart (lib. ii. cap. 27. p. 160.) Sofala is thought by Moquet to be the Sopheira of the Septuagint, and he grounds his opinion on the fact, that liquids are often put for one another, ſo that Sopheira and Sofala might be uſed indiſcriminately as the name of the ſame place. Lopez, in his Indian Voyage relates, that the inhabitants of the country near Madagaſcar, boaſt that they have books which prove, that in the time of king Solomon the Iſraelites made a voyage thither every third year to fetch gold. In the Mélanges de Geographie et d'Hiſtoire naturelle, par Zein-eddin Omar, fils d'About Modhaffer, ſurnommè Ebn al-ouardi, ecrivain du xiii ſiècle, of which an account is given in Notices des MSS. du Roi, tom. xi. p. 40, Sophala is called Sophala eddhabab, or the Golden Sofala. This opinion is ſtrongly and learnedly ſupported by D'Anville, in his Diſſertation ſur la Pays d'Ophir, publiſhed in the Memoires de Literature, tom. xxx. p. 83, &c. But it has received the moſt ample and elaborate elucidation by Bruce, in the ſecond book of his Travels, c. 4, who ſeems to have convinced Dr. Robertſon, (Hiſtorical Diſquiſition concerning India, p. 10.) It will, therefore, be proper to conſider this hypotheſis, as ſupported and elucidated by Bruce, at ſome length.

He commences his inveſtigations and reaſonings on this ſubject, by laying down three poſitions; 1ſt. That the trade to Ophir was carried on from the Elanitic gulf, through the Indian ocean; 2dly. That gold, ſilver, and ivory, but principally ſilver, were the commodities obtained by this trade; and 3dly. That the time occupied in this voyage in going to Ophir, and returning from it, was preciſely three years.

The great difficulty with Mr. Bruce ariſes from the ſuppoſed length of the voyage; for it does not ſeem probable, that three years would be conſumed in going from the Red ſea to the Mozambique channel, and in returning to Eziongeber, even in the imperfect ſtate of navigation in Solomon's time. In order to obviate this difficulty, Mr. Bruce has recourſe to the obſtacles to the voyage, which the monſoons of the Arabian gulf would throw in the way of theſe inexperienced navigators. Before proceeding to point out how the monſoons would lengthen the voyage exactly to the period of three years, he adduces ſome collateral arguments to prove that Sofala was famous for its gold mines. According to John Dos Santos in 1568, he ſailed up the river Cuama, as far as Tete; from this place, he penetrated nearly 200 miles into the interior of the country, where he ſaw gold mines working at a place called *Afura;* ſtill farther up the country, he underſtood that the ſilver mines of Chicoua were ſituated: at both places there were appearances of the mines having been wrought for a long ſeries of years, and large remains of maſſy buildings.

Mr. Bruce ſuppoſes, that the fleet of Solomon left Eziongeber in the month of June; at this ſeaſon of the year the northern monſoon prevails, which would carry the ſhips as far as Mocha; at this place, the courſe of the gulf changing, though the monſoon continued to blow in the ſame direction, it would be no longer favourable for the proſecution of the voyage. The fleet, therefore, he ſuppoſes, would anchor in the harbour of Mocha. In the month of Auguſt it would be again able to proceed, and clear the ſtraits of Babelmandeb. After this, its courſe was nearly ſouth-weſt; and as at cape Gardefan the wind at this time of the year blows from that quarter, the fleet would be obliged to anchor under the cape, or in a port near it, which was afterwards called Promontorium Aromatium. Here it was detained till the month of November, but during this ſtay, Mr. Bruce ſuppoſes, that ivory, frankincenſe, and myrrh were purchaſed, as part of the cargo, for which the fleet was ſent out. In the month of November the wind changes to north-eaſt, and as this was extremely favourable to the fleet, the courſe of which was ſtill ſouth-weſt, it again proceeded on its voyage, which would have ſoon been completed, but off Melinda, towards the beginning of the following month, an irregular monſoon ſets in from the ſouth-weſt, and, conſequently, directly in the teeth of the ſhips. This change in the wind compelled the ſeamen to put into port; and at this place, near Melinda, a city or diſtrict is ſituated, called Tarſhiſh; this Mr. Bruce conſiders as a ſtrong corroboration of the accuracy and truth of this opinion, both with reſpect to the ſituation of Ophir, and with reſpect to the time and courſe of the voyage thither. But the evidence on which this author endeavours to prove, that a place called Tharſhiſh or Tarſhiſh was ſituated near Melinda, appears to us very ſlight and inconcluſive. The Annals of Abyſſinia mention, that Amda Icon, making war on that coaſt in the 14th century, gives a liſt of the rebellious Mooriſh vaſſals, and the chief of Tarſhiſh is particularly noticed, in the very place where Mr. Bruce places that city or diſtrict. But it is hardly juſt to infer the name of a place in Solomon's time, from the name which it bore in the 14th century, beſides the probability, that, as this Tarſhiſh was governed by a Mooriſh chief, the name was given it by that nation, from the place whence they derived their origin. At this place, which Mr. Bruce ſuppoſes to have been Tarſhiſh, the fleet were obliged to ſtay till the month of April of the ſecond year; at the end of that month, or towards the beginning of May, the wind comes round to the north-eaſt, and as the diſtance to Sofala was now very trifling, the fleet probably reached its ultimate deſtination the ſame month that it left Tarſhiſh. As the north-eaſt monſoon continues from May till October, the fleet would be detained all this time at Sofala; in the beginning of November, the ſouth-weſt monſoon ſets in, and with this it ſails on its return to the Red ſea. This monſoon, Mr. Bruce ſuppoſes, would carry it as far as Melinda or Tarſhiſh, when the north-eaſt monſoon would again meet it, and would oblige it to put into port, and remain there till the ſouth-weſt wind ſprung up in the month of May, of the third year of its voyage. This wind would continue till the fleet arrived within the ſtraits at Mocha, where it would be again detained by the ſummer monſoon, blowing directly in its teeth from Suez. In October or November, the adverſe northerly monſoon gives way to a ſouth-eaſt wind, which would carry it up into the Elanitic gulf, towards the end of December of the third year.

Setting aſide all objections to this ingenious mode of explaining and defending his hypotheſis, founded on the opinion, which we have already repeatedly ſtated, that there is no evidence that Tarſhiſh was viſited during the voyage to Ophir, or that the voyage occupied three years, it is too obvious,

obvious, that Mr. Bruce has accommodated the circumſtances and duration of this ſuppoſed voyage to his preconceived notions; and after all the duration cannot properly be ſaid to have been three years, as the fleet is ſuppoſed to have left Ezion-geber in the ſummer, and to have returned in the December of the third year; beſides, if the account of the direction and period of the monſoons, as given by Mr. Bruce, when the fleet was outward bound, be compared with the account of their direction and continuance, when it was homeward bound, they will not be found to accurately agree.

The laſt hypotheſis which we ſhall notice, ſuppoſes that the fleet of Solomon, in its voyage to Ophir and Tarſhiſh, actually ſailed round the Cape of Good Hope, and came to Joppa, by the Mediterranean. This hypotheſis is ſupported by Huet: he thinks that Ophir was a general name for all the Oriental coaſt of Africa, particularly of the country of Sofala; in this reſpect agreeing with Bruce; and that Tarſhiſh was alſo a general name for all the occidental coaſt of Africa and Spain, and in particular of that coaſt in the neighbourhood of the mouth of the river Guadalquivir, a country fertile in mines of ſilver; he alſo maintains that the Cape of Good Hope was known, often frequented, and doubled in Solomon's time, and for many years afterwards. Hiſtory of Commerce and Navigation, p. 19, 20.

A writer in the Gentleman's Magazine (for 1786, p. 28.) coincides in opinion with Huet that the fleet of Solomon in its voyage doubled the Cape of Good Hope, and he places Ophir on the weſt coaſt of Africa; Guinea and Negroland he ſuppoſes to have been the places viſited by Solomon's fleet. In ſupport of this opinion, he offers, however, but weak and fantaſtical arguments. One of them is, that the Hebrew words, which ſignify *duſt* and *aſhes*, make up the etymon of Ophir; and as gold duſt principally is found in Guinea, and Eliphaz in his exhortation to Job, tells him he ſhall lay up gold as duſt, and the gold of Ophir as the ſtones of the brooks, he infers that Ophir is to be ſought for in Guinea: another of his proofs is drawn from the circumſtance that circumciſion is uſed among the negroes of the Gold Coaſt, which may have been introduced here by the Hebrews.

But the opinion that the fleet of Solomon, in its voyage to Ophir and Tarſhiſh, circumnavigated Africa, is moſt ſtrongly and ably ſupported by Dr. Doig, formerly maſter of the grammar ſchool at Stirling, and the author of the letters, addreſſed to lord Kames, on the Savage State.

He ſuppoſes that there were ſeveral places called Ophir; that the original Ophir, ſo named from the ſon of Joktan, was ſituated at no great diſtance from Judea, and that it was from this Ophir that the gold mentioned in Job was obtained. As the original Ophir abounded in gold, this name was applied to ſeveral other places, where that metal was found in great plenty; but that the Ophir of Solomon was not, as Mr. Bruce maintains, ſituated on the ſouth-eaſt coaſt of Africa, becauſe the fleet, in the very ſame voyage, touched at Tarſhiſh, which lay in a very different quarter.

In order, therefore, to aſcertain the ſcite of Ophir, Dr. Doig deems it neceſſary previouſly to fix the ſituation of Tarſhiſh: this name was alſo given to many places: the original Tarſhiſh was ſituated on the weſtern coaſt of Aſia Minor: but this original Tarſhiſh, Dr. Doig contends, was not the Tarſhiſh of Solomon. This place, according to him, was ſituated in Spain, in that part of it in which Huet places it; *viz.* in Spaniſh Bœtica, near the mouth of the Guadalquivir. It appears from Iſaiah and Ezekiel that the merchants of Tarſhiſh traded in the markets of Tyre with ſilver, iron, lead, and tin; and Jeremiah expreſsly ſays, "ſilver ſpread into plates is brought from Tarſhiſh:" but that part of Spain which lies on the river Guadalquivir, was famous among the ancients for its mines of ſilver. Beſides, the river Bœtis, which divides Bœtica, is called *Tarteſſus* by Ariſtotle, Strabo, and ſeveral other authors; and in this neighbourhood were a lake and city of the ſame name. Dr. Doig next proceeds to prove that Tarteſſus and Tarſhiſh are the very ſame name; the Phœnicians changing the *ſchin* into *thau*, made the latter word Tartiſh.

Having thus fixed the ſituation of Tarſhiſh, Dr. Doig next proceeds to aſcertain the poſition of Ophir. This he concludes to have been on the coaſt of Guinea. In reply to the objection, that the fleet of Solomon would not have gone ſo far as the weſt coaſt of Africa for gold, he replies that at this time no gold was to be found on the eaſtern coaſt: but his argument on this point evidently proceeds on taking for granted his own hypotheſis. If they had found gold (he obſerves) on any part of the eaſtern coaſt, they would have returned to Ezion-geber, and not proceeded round Africa, merely for the purpoſe of trading at Tarſhiſh, but as they did not find gold on this coaſt they were obliged to double the Cape, and then it was more eaſy to proceed home by Tarſhiſh, than by the route according to which they came. After having completed their cargo at this latter place, Dr. Doig ſuppoſes the fleet ſailed for Joppa; and that the next voyage was reverſed, *i. e.* they firſt viſited Tarſhiſh in Spain, then Guinea, and ſo doubled the Cape, and returned along the eaſtern coaſt of Africa, and up the Red ſea, to Ezion-geber.

Both Dr. Doig, and the writer in the Gentleman's Magazine, endeavour to ſupport their opinion, that the fleet of Solomon circumnavigated Africa, by the account which Herodotus gives of the voyage round the Cape of Good Hope, which was performed during the reign of Necho, king of Egypt. According to this hiſtorian, the fleet ſent out by that monarch was navigated by Phœnician mariners; it ſailed from a port in the Red ſea; it returned by the ſtraits of Gibraltar; and it was exactly three years in its voyage. The truth of this narration by Herodotus has been queſtioned; but in our opinion, without any ſolid reaſon; indeed the circumſtance, which he mentions with aſtoniſhment and ſome degree of incredulity, as having occurred during this voyage, *viz.* that in one part of the courſe the ſhadows fell on the right hand, is ſo unlikely to have been an invention of the mariners, ſo diſſimilar to all the marvellous ſtories related of diſtant countries in thoſe times, and yet ſo certainly true, that it alone proves that Africa had been circumnavigated, or at leaſt that the voyage had been proſecuted beyond the line. But, we imagine, a little reflection on this voyage which is mentioned by Herodotus, will convince us that it rather makes againſt, than for the truth of the opinion, that the Cape was doubled in Solomon's time. As the Phœnicians were employed by Solomon, it is natural to ſuppoſe that they had gone this voyage frequently before. Indeed, both Huet and Dr. Doig maintain that the circumnavigation of Africa had been often accompliſhed by the Phœnicians, before they were employed by Solomon. Now the voyage performed round Africa in the reign of Necho, which Herodotus mentions, took place two centuries after the time of Solomon. But Herodotus relates it as ſomething very extraordinary; indeed his manner would naturally lead to the ſuppoſition that ſuch a voyage had never been performed before: if it had been performed frequently before by the Phœnicians, it is not probable that the mariners, on their return from this voyage, would have particularly mentioned the circumſtance of their ſhadows falling on their right; nor would

Herodotus

Herodotus have been unwilling to credit it, if it had been confirmed by the teſtimony of thoſe who had performed the ſame voyage before. As, therefore, from the account of the hiſtorian, the voyage undertaken in the reign of Necho, two centuries after Solomon, was evidently no common event, we are juſtified in doubting, at leaſt, whether the fleet of the Jewiſh monarch circumnavigated Africa, and conſequently whether Ophir was ſituated on the weſt coaſt of that continent.

To conclude, if we are correct in the opinions we have advanced, that there is no evidence in ſcripture, that Ophir and Tarſhiſh were viſited during the ſame voyage; that the voyage to either, or both, actually took up three years; and that the Tarſhiſh of Solomon was a different place from the Tarſhiſh in Cilicia; it is evident that the inveſtigations hitherto made into the ſituation of theſe places, and into the courſe of the voyages performed by Solomon's fleet, proceed on unſupported data; and, conſequently, though ſome of them diſplay great ingenuity and learning, they can only lead us aſtray from the real object of our reſearch.

Ophir, in *Geography*, a mountain of Sumatra, ſituated immediately under the equinoctial line, and ſuppoſed to be the higheſt viſible from the ſea; its ſummit being elevated 13,842 feet above that level. The following is the reſult of obſervations made by Mr. Robert Nairne concerning the height of mount Ophir: height of the peak above the level of the ſea, in feet, 13842, Engliſh miles 2,6216, nautical miles 2,26325; inland, nearly, 26 nautical miles; diſtance from Maſſang point 32 nautical miles; diſtance at ſea before the peak is ſunk under the horizon, 125 nautical miles; latitude of the peak 0° 6′ N.; a volcano mountain, S. of Ophir, is ſhort of that in height by 1379 feet; inland, nearly, 29 nautical miles.

The idea of Sumatra being the country of Ophir, whither Solomon ſent his fleets, is too vague, ſays Mr. Marſden, and the ſubject wrapt in a veil of too remote antiquity to admit diſcuſſion. The name of Ophir was given to the mountain of Sumatra by the Europeans in modern days. Another near Malacca is alſo ſo named.

OPHIRA, in *Botany*, a genus of uncertain derivation. This plant was originally diſcovered by Burmann in Africa. Both Juſſieu and Schreber conſidered it as nearly allied to the *Grubbia* of Bergius; and Dr. Smith, upon examination, finds them to be one and the ſame plant. (See Grubbia.) Of courſe the original name remains.—Linn. Mant. 150. Schreb. 259. Willd. Sp. Pl. v. 2. 414. Mart. Mill. Dict. v. 3. Juſſ. 321. Lamarck Dict. v. 4. 565. Illuſtr. t. 293. —Claſs and order, *Octandria Monogynia*. Nat. Ord. *Onagræ*, Juſſ.

Gen. Ch. *Cal.* Involucrum of two lateral, kidney-ſhaped, emarginate, conduplicate, permanent valves, containing three flowers. *Cor.* ſuperior, of four, oblong, converging petals. *Stam.* Filaments eight, the length of the corolla; anthers ovate. *Piſt.* Germen inferior, turbinate, hiſpid, ſtyle thread-ſhaped, ſhorter than the ſtamens; ſtigma emarginate. *Peric.* Berry of one cell. *Seeds* two.

Eſſ. Ch. Calyx a two-valved involucrum, containing three flowers. Petals four, ſuperior. Berry of one cell.

1. O. *ſtricta*. Linn. Mant. 229. Lamarck Illuſtr. t. 293. —Native of Africa.—The *ſtems* of this little erect ſhrub are quadrangular, and greyiſh. *Leaves* oppoſite, linear or lanceolate, rather pointed, coriaceous, green above, ſilvery white beneath, on ſhort ſtalks. *Flowers* axillary, ſeſſile, lateral, oppoſite, capitate. *Berry* a little, oblong, very reſinous ſort of cone, ſomewhat like a minute ſtrawberry.

Ophites, ὀφίτης, in *Natural Hiſtory*, a ſort of variegated marble of a duſky green ground, ſprinkled with ſpots of a lighter green; otherwiſe called *ſerpentine*.

It is thus called from the Greek, ὄφις, *ſerpent*; becauſe its ſpots reſemble thoſe of that animal.

The ancients knew three ſpecies of this kind, which they call the black, the white, and the grey ophites, and this laſt alſo frequently *tephria*; and allowing theſe ſpotted variegations to be the characters of an ophites, we have, beſide theſe, two others known at this time.

The other two ophitæ, which ſeem not to have been known to the ancients, are, 1. A greyiſh-brown one with green ſpots. It is frequent in Egypt and Arabia, and is ſaid to have been dug in England. 2. A pale grey one, with green ſpots and veins. It is very hard, and capable of an elegant poliſh. It is frequent in Germany, and tables are made of the large pieces and vaſes of the ſmaller ones. It is ſaid alſo to be found in England.

Ophites, in *Eccleſiaſtical Hiſtory*, is alſo the name of a ſect of ancient heretics, who ſprung out of the Gnoſtics, in the latter end of the ſecond century; ſo called from their worſhipping the ſerpent that ſeduced Eve.

This ſerpent, they taught, was inſtructed thoroughly in all knowledge; and they make it the father and author of all the ſciences. On which principle they founded a thouſand chimeras; part of which may be ſeen in St. Epiphanius. See Gnostic.

They ſaid this ſerpent was the Chriſt; that he was very different from Jeſus born of the Virgin, into whom, ſaid they, the Chriſt deſcended; and that it was this Jeſus, not the Chriſt, that ſuffered. Accordingly, they made all thoſe of their ſect renounce Jeſus to follow Chriſt.

In conſequence of this opinion, they nouriſhed a certain number of ſerpents, which they looked upon as ſacred, and to which they offered a ſubordinate kind of honour and worſhip.

The Sethians, or Sethites, mentioned by Theodoret, were either the ſame with the Ophites, or very little different from them.

The leader of this ridiculous ſect was one Euphrates; it had its origin among the Jews, and was of a more ancient date than the Chriſtian religion. A part of its followers embraced the Goſpel, while the other retained their primitive ſuperſtition; and from hence aroſe the diviſion of the Ophites into Chriſtian and Antichriſtian.

OPHIUCUS, in *Aſtronomy*, a conſtellation of the northern hemiſphere; called alſo Serpentarius. See Constellation and Serpentarius.

OPHIURUS, in *Botany*, ſo denominated from ὄφις, *a ſerpent*, and οὐρά, *a tail*, becauſe of the ſlender-jointed ſtructure of the ſpike, is a genus of graſſes, founded by Gærtner, and publiſhed by his ſon, in the third volume of his work on fruit and ſeeds, p. 3. t. 181. f. 3. The two ſpecies there deſcribed are *Rottböllia incurvata* and *corymboſa* of Linnæus. Mr. Brown, Prodr. Nov. Holl. v. 1. 206, retains the latter only as conſtituting the genus in queſtion; referring the former, with ſome heſitation, to his own *Lepturus*, which is *Rottböllia repens* of Forſter's *Prodromus*, n. 151. *Ophiurus* ſeems to differ from *Lepturus* chiefly in having the glume of the calyx ſimple, or of one leaf, inſtead of two parallel ones, a diſtinction which appears to us, in this caſe, rather artificial.

OPHIUSA, or Ophinza, ſometimes called *Orphiſa*, in *Ancient Geography*, an iſland which ſome have confounded with the iſle of Fromentera, for an account of which ſee Pityuse *Iſlands*. The Ophiuſa was called by the Romans Colubraria, and the moderns have given it the name of Moncalobrer (Columbrates); it is ſituated on the coaſt of the kingdom of Valencia in Spain.

Ophiusa was alſo, according to Pliny, the ancient name of the iſland of Rhodes; and according to Steph. Byz. the name of Libya.—Alſo, a town placed by Strabo on the ſouthern bank of the river Tyras, 140 ſtadia from its mouth; it is now "Palenca."

OPHIUSSA, the ancient name of the iſle of Thenos, one of the Cyclades, according to Pliny.—Alſo, a ſmall iſland in the vicinity of the iſle of Crete, and near Hierapytna. Pliny.

OPHRINIUM, or Ophrynium, *Renn-Keui*, a town of Aſia Minor, in the Troade, near Dardanum or Dardanus and Rhætium. Here was a grove conſecrated to Hector. This town is mentioned by Herodotus, Strabo, and Xenophon, the laſt of whom ſays that the inhabitants ſacrificed hogs and burnt them entire.

OPHRYS, in *Botany*, from οφρυς, *the eye-brow*, owed that appellation, as we learn from Pliny, to its having been uſed for blackening the eye-brows. His deſcription, of the toothed leaves, does not however by any means accord with any *Ophrys* of modern botaniſts. Linn. Gen. 462. Schreb. 502. Willd. Sp. Pl. v. 4. 61. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 931. Brown Prodr. Nov. Holl. v. 1. 313. Swartz. Act. Holm. for 1800. 222. t. 3. f. D. Schrad. N. Journ. v. 1. 43. t. 1. f. D. Juſſ. 65. Lamarck Illuſtr. t. 727.—Claſs and order, *Gynandria Monandria*. Nat Ord. *Orchideæ*.

Gen. Ch. *Cal.* Perianth ſuperior, of three oblong, ſpreading, often coloured leaves. *Cor.* Petals two, oblong, ſmaller than the calyx. Nectary a large, convex, lobed, coloured lip. *Stam.* Filament none; anther terminating the ſtyle, of two cells in front, each containing one ſtalked maſs of pollen, proceeding from a diſtinct pouch at the baſe. *Piſt.* Germen inferior, oblong, twiſted; ſtyle ſhort, erect; ſtigma in front, convex, broad, below the anther. *Peric.* Capſule oblong, of one cell, with three ribs, burſting longitudinally between the ribs. *Seeds* very numerous, minute, roundiſh, each with a chaffy tunic.

Eſſ. Ch. Lip from the baſe of the ſtyle, ſpreading, convex, lobed, without a ſpur. Anther terminal, fixed to the ſtyle, of two cells. Maſſes of pollen ſolitary, ſtalked, from ſeparate pouches at the baſe.

Obſ. Swartz, and after him Willdenow, conſiders this genus as differing from *Orchis*, merely in the want of a ſpur. Mr. Brown has firſt, from the obſervations of Mr. Francis Bauer of Kew, detected a very curious character, by which the genuine ſpecies of *Ophrys*, reſembling the bodies of various inſects in the form and colours of their lip, and forming a moſt natural genus by themſelves, are kept ſeparate. This character conſiſts in the origin of the ſtalked maſſes of pollen, each from a ſeparate pouch or bag. In *Orchis* they both ſpring from a ſingle one; in *Habenaria*, to which *Orchis bifolia* belongs, there is no ſuch pouch at all at the baſe of the anther.

We have three of theſe plants wild in Britain, *O. muſcifera*, Engl. Bot. t. 64; *apifera*, t. 383; and *aranifera*, t. 65. They are found in chalky ground, the firſt and the laſt but rarely. The *apifera*, commonly called the Bee Orchis, is leſs unfrequent, and ſometimes abounds in dry gravelly paſtures, where it bloſſoms in July. Several exotic ſpecies have been adopted by Willdenow from Cavanilles and others; and ſome have been recently publiſhed by Deſfontaines, (from the drawings of Tournefort's plants in the Muſeum at Paris,) in the Annales du Muſeum d'Hiſtoire Naturelle, v. 10. We are not poſſeſſed of ſufficient materials at preſent to give a detailed hiſtory of the whole; becauſe we cannot confront the ſpecimens of the different authors who have laboured at this ſubject, and who ſeem, in ſome inſtances, to have deſcribed the ſame thing under different names.

Ophrys, in *Gardening*, comprifes plants of the bulbo-fibrous-rooted perennial kind, of which the ſpecies cultivated are; the common ophrys, or twayblade (O. ovata); the ſpiral ophrys, or triple ladies traces (O. ſpiralis); the bird's neſt ophrys (O. nidus-avis); the fly ophrys (O. muſcifera); the bee ophrys (O. apifera); the ſpider ophrys (O. aranifera); the yellow or muſk ophrys (O. monorchis); and the man ophrys (O. anthropophora).

The firſt ſort varies with three leaves.

And of the fourth ſort there are ſeveral varieties, as the fly-ſhaped; the great fly; the large green fly; the blue fly; and the yellow fly.

The ſixth ſpecies is fancied by ſome to reſemble a bee, by others a ſpider; from the breadth of the lip, and its being marked with different ſhades of brown, it derives its reſemblance to the latter. Others have diſcovered a likeneſs to a ſmall bird in the flower.

The eighth ſort varies in ſize, and in the colour of its flowers, from yellow green to bright ferruginous.

*Method of Culture.*—All theſe plants may be introduced into the different parts of pleaſure-grounds from the places where they grow naturally in this country, and be preſerved; but they do not admit of being propagated in them; the proper period for this purpoſe is juſt before the ſtalks decay, in the latter end of ſummer or beginning of autumn, as at that ſeaſon the bulbs will be in the beſt ſtate for growing ſtrong and flowering the following year. The roots ſhould be taken up with large balls of earth round them, and be planted again as ſoon as poſſible. They ſhould always be placed ſo as that the ſoils and ſituations may be as nearly as poſſible ſimilar to thoſe from which they were taken; thoſe taken from woods being planted out in ſhady ſituations; thoſe from boggy or marſhy places, in the more moiſt and boggy parts; and thoſe from dry elevated ſituations, in ſuch as have the greateſt degrees of dryneſs and are the moſt open. They ſhould afterwards be as little diſturbed as poſſible by any ſort of culture: with this ſort of management the roots will often continue for ſeveral years, flowering annually during the ſummer.

But in the culture of the ſixth ſort, Mr. Curtis ſucceeded by taking them up from their natural ſituations when in flower, and baring their roots no more than was neceſſary to remove the roots of other ſorts of plants; then filling large ſized garden-pots, with three parts good moderately ſtiff loam, and one part chalk mixed well together, paſſing them through a ſieve ſomewhat finer than a cinder-ſieve, afterwards planting the roots in them to the depth of two inches, and, where there is more than one, three inches apart, watering them occaſionally during the ſummer ſeaſon, in dry weather, and on the approach of winter placing the pots under the protection of a frame and glaſſes, in order to prevent their being injured by wet or froſts.

All the plants afford variety, and are highly ornamental in the clumps, borders, and other parts of ſhrubberies, &c.

OPHTHALMIC, in *Anatomy*, from οφθαλμος, *the eye*, a term applied to parts connected with the eye, as the artery, vein, nerve, ganglion, &c.

OPHTHALMICS, medicines proper for diſeaſes of the eyes.

Such are ophthalmic waters. (See Water.) Ophthalmic powders, ointments, &c. There is an excellent ophthalmic prepared of ſaccharum ſaturni

OPHTHALMODYNIA, from οφθαλμος, and οδυνη, *pain*, an itching burning pain in the eye, without redneſs, and without any material increaſe of ſenſibility.

OPHTHALMOGRAPHIA, formed from οφθαλμος, *eye*, and γραφω, *I deſcribe*, that branch of anatomy which

conſiders the ſtructure and compoſition of the eye, the uſe of its parts, and the principal effects of viſion.

Our countryman Dr. William Briggs has publiſhed an excellent ophthalmographia, and Plempius another.

OPHTHALMOPONIA, from οφθαλμος, and πονεω, *to labour*, an intenſe pain in the eye, rendering light intolerable.

OPHTHALMOPTOSIS, from οφθαλμος, and πτωσις, *a fall*, a protruſion or diſplacement of the eye. See EXOPHTHALMIA.

OPHTHALMORRHAGIA, from οφθαλμος, and ῥεω, *to flow*, bleeding from the eye or eye-lid.

OPHTHALMOSCOPIA, that branch of phyſiognomy which conſiders a perſon's eyes and looks; to deduce thence the knowledge of his temperament, humour, and manners.

OPHTHALMOXYSTRIS, from οφθαλμος, and ξυστρον, *a bruſh*, the operation of ſcarifying the eye with a bruſh, as anciently practiſed.

OPHTHALMOXYSTRUM, a bruſh for ſcarifying the eye.

OPHTHALMY, OPHTHALMIA, *Ophthalmitis*, derived from οφθαλμος, *the eye*, is the general name by which inflammation of this delicate and important organ is expreſſed.

Inflammation of the eye originates in the ſame manner, and demands the ſame kind of treatment, as inflammation in other parts of the body; the general obſervations, therefore, which have been delivered upon this ſubject in the article INFLAMMATION, are for the moſt part applicable to caſes of ophthalmy. In the preſent place it is our particular duty to conſider only the peculiarities of inflammation of the eye, and the circumſtances in which it differs from other ordinary inflammations.

Of all the diſeaſes of the eye, ſays the experienced Richter, ophthalmy is the moſt frequent. There are very few diſeaſes of the eye which do not ſometimes ariſe from it, and in many of them it is a neceſſary ſymptom or conſequence. The characteriſtic ſigns of the diſorder are pain and redneſs: the latter is particularly remarkable, as the healthy eye exhibits no red appearance whatſoever. It does not conſtantly happen, however, that redneſs is an obvious ſymptom of an inflamed eye; ſome violent ophthalmies are ſaid to be attended with little or no preternatural redneſs of the affected organ. Richter adduces, as inſtances, what he calls the *catarrhal*, or *rheumatic* ophthalmy, and the inflammation which chiefly affects the interior of the eye, a caſe that is termed *phlegmone oculi*. Beſides, even when the inflamed part is conſiderably reddened, it frequently occurs that the change is concealed, by reaſon of the impoſſibility of making the patient open his eye. The increaſed redneſs is always moſt conſpicuous in the white of the eye; but often in ſevere ophthalmies, the tranſparent cornea alſo becomes red, and bleeds, if punctured or cut. The aqueous humour has been obſerved to become of a red colour, an event which no doubt proceeded from extravaſated blood; and ſometimes ſmall veſicles, full of this fluid, have been formed upon the cornea. The dark red ſwelling of the conjunctiva, attendant on violent degrees of ophthalmy, and termed *chemoſis*, ariſes from an effuſion of blood underneath that membrane. The eye-lids, likewiſe, not unfrequently partake of the inflammatory redneſs. In caſes where the eye either cannot or muſt not be opened, it may always be inferred, that the eye-ball is inflamed, if the lower edge of the upper eye-lid, or the whole of this part, ſhould appear to be affected with ſwelling and redneſs.

The pain is the principal ſymptom of ophthalmy; and, indeed, when the eye cannot or muſt not be opened, it is the only one. It is of different kinds. In mild ophthalmies the patients experience a ſenſe of heat, or itching, or a ſort of preſſure, that ſeems as if it proceeded from the lodgment of a particle of ſand underneath the eye-lids; but, in ſevere caſes, the pain is of a burning, tenſe, ſhooting, throbbing deſcription. When the patient has a ſenſation as if the orbit were too ſmall, and as if the eye-ball protruded from not having ſufficient room; and when he ſuffers, particularly about the eye-brow, a violent, oppreſſive, tenſe pain, ſometimes extending from the affected ſide of the head to the occiput; it may be concluded, without riſk of miſtake, that the inflammation has attained the higheſt degree of violence, and that there is imminent danger of ſuppuration.

But even pain is not to be regarded as a conſtant and eſſential ſymptom of ophthalmy. There are, ſays Richter, ſome ſevere ophthalmies, which are accompanied with little or no pain; while certain milder caſes of inflammation of the eye ſometimes prove exceſſively painful. Examples of this kind are ſubject to variety. Hardy, unfeeling patients frequently make little complaint about pain, and the ſurgeon who truſts to their aſſurance, that the ſymptom is moderate or trifling, frequently finds, very unexpectedly, upon opening the eye-lids after a few days, the eye moſt vehemently inflamed, nay ſometimes actually in a ſtate of ſuppuration. Irritable ſubjects, on the contrary, often cannot bear a very ſlight degree of pain, and make the ſurgeon have recourſe to means, which are in reality unneceſſary. Experience proves alſo, that, in the majority of caſes, the pain is moſt violent at the commencement of the inflammation, at the very moment when the diſorder firſt originates, and that it afterwards diminiſhes, and even entirely ſubſides, notwithſtanding the inflammation continues in an unabated degree. It frequently happens, after an operation on the eye, that the patient only experiences pain for a few hours in the courſe of the firſt night, and afterwards remains completely eaſy. The ſurgeon ſhould never ſuffer himſelf to be deceived by this ſhort duration and quick ſubſidence of the pain; for, under theſe circumſtances, the eye is often found moſt ſeriouſly affected with inflammation. Old chronic ophthalmies are not uncommonly attended with conſiderable redneſs, and with little or no pain. Laſtly, it deſerves to be noticed, that the pain accompanying inflammation of the eyes is ſometimes periodical. In the generality of ſuch caſes, the patients only experience pain an hour or two in the night-time, and during the day are quite free from any degree of ſuffering. Theſe ſhort paroxyſms of pain, and long intervals of eaſe, muſt not be received as a criterion of the mildneſs of the inflammation; for the eye may yet be violently inflamed. That the eye is ſometimes exceedingly painful, without being affected with inflammation, will be hereafter explained. The ſurgeon muſt not truſt to any ſingle ſymptom; but form a judgment from the conſideration of all the circumſtances of the caſe together.

Beſides the ſymptoms already pointed out, there are ſeveral others, which, though they do not commonly accompany ophthalmy, ſometimes do ſo, and conſequently demand the attention of the ſurgeon. The inflamed eye occaſionally perceives and bears the light, juſt as if it were in a healthy ſtate: this is uſually the caſe in mild and favourable ophthalmies. Sometimes the eye is ſo irritable, that the entrance of a very ſmall quantity of light into it cauſes a profuſe diſcharge of tears, and intolerable pain. This ſtate of things manifeſts itſelf in ſevere ophthalmies, particularly in thoſe which have been termed *catarrhal*, *humid*, &c. and are attended with a copious ſecretion of irritating tears. Sometimes ophthalmy is accompanied with a diminution or total loſs of ſight. This event is of the worſt kind. The

blindneſs, which always indicates a violent and dangerous degree of inflammation, originates either from an opacity of the cornea, or a complete cloſure of the pupil, two not unfrequent conſequences of ſevere ophthalmy: or it may proceed from the effect of the inflammation upon the retina, and, in this caſe, the diſorder uſually leaves behind it the gutta ſerena. See GUTTA *Serena*.

Swelling, which is an ordinary ſymptom of inflammation of other parts, is alſo ſometimes obſerved in inflammation of the eyes, being particularly obvious in that portion of the conjunctiva which covers the white of the eye. In violent ophthalmies, this membrane ſwells in ſuch a degree, that it envelopes the cornea, and lies in a thick fold between the eye-lids, protruding betwixt theſe parts, and hindering them from being ſhut. In this ſort of caſe the whole eye-ball reſembles a piece of red fleſh. In ſevere ophthalmies, the tranſparent cornea likewiſe ſometimes ſwells very conſiderably, ſo as to become four and even eight times as thick as it is in the healthy ſtate. This tunic is generally rendered at the ſame time white and ſoft. When ſuch thickening extends inward, the anterior chamber of the aqueous humour is leſſened, and may be quite obliterated, the inner ſurface of the cornea being in cloſe contact with the iris. In this circumſtance the inflammation uſually occaſions a preternatural adheſion of the iris to the cornea; a diſorder that is technically named *ſynechia*. When the thickening of the cornea projects outwardly, the affection often ends in a *ſtaphyloma*; which ſee. Experience proves, however, that ſuch thickening and opacity of the cornea ſometimes entirely diſappear with the inflammation, this membrane re-aſſuming all its proper qualities. The eye-lids alſo frequently participate in the inflammation with the globe of the eye, and they ſwell in ſuch a degree, that it is altogether impoſſible to ſeparate them from each other. In ſevere ophthalmies, the whole eye-ball has been obſerved to be affected with preternatural ſwelling.

In caſes of ophthalmy, fever is alſo frequently an attendant. According to Richter, it is worthy of particular notice, that the fever is not always of one and the ſame kind; but preſents itſelf under three varieties. Sometimes it is the effect of the ſame cauſe which produces the inflammation, and, in this circumſtance, the ſame means of cure are indicated, both for the fever and the ophthalmy. The ophthalmy proceeding from diſorder of the gaſtric organ affords an illuſtration of the preceding obſervation, emetics and purgative medicines ſerving, in this inſtance, to cure both the fever and the inflammation of the eyes. The fever is ſometimes the conſequence of the inflammation: here the local affection precedes the conſtitutional one; the latter being always in proportion to the former, moderate when it is moderate, violent when it is violent. This kind of fever requires the employment of antiphlogiſtic means, whereby its cauſe, *viz.* the inflammation, is removed, and the name of inflammatory fever is particularly applicable to it. After ſurgical operations on the eye, and other injuries of this organ, a fever often ariſes even before the ſlighteſt inflammation is diſcernible. It appears to be owing to the patient's apprehenſion before the operation, and to the pain which he has ſuffered, and it demands the employment of ſoothing anodyne means, eſpecially opium combined with antimonials. Richter alſo enjoins us to be aware that the fever which attends inflammation does not always retain the type with which it firſt aroſe, but may in its courſe put on a complicated character, the cauſes of which may be in the nature of the patient's conſtitution, or be of an epidemic or endemial kind.

Ophthalmies, even thoſe which are not very ſevere, frequently produce incurable defects in the eyes; and, when we reflect upon the delicate ſtructure of theſe organs, we cannot be ſurpriſed at their being ſo ſuſceptible of injury. The moſt common conſequences of violent ophthalmies are; opacities of parts naturally tranſparent, eſpecially of the cornea and capſule of the cryſtalline lens; cloſure of the pupil; gutta ſerena; ſtaphyloma, &c. Sometimes the inflammation occaſions ſuppuration. It often gives riſe to ulcers upon the cornea, or margins of the eye-lids. When one eye is affected with inflammation, the other ſeldom continues free from this affection. Alſo, when the ophthalmy is owing to a local external cauſe, the other eye frequently participates in the inflammation. When once the eye has been violently inflamed from ſome cauſe or another, it continually retains, in many inſtances, a tendency to freſh inflammation, and ophthalmy is re-excited by the ſlighteſt cauſes. In ſevere ophthalmies, two different ſtages are often obſervable. The firſt is attended with heat, and conſiderable pain and fever; the ſecond is more chronic, being unaccompanied with pain or febrile ſymptoms. The eye is merely weakened, humid, and more or leſs red. This ſecond ſtage of ophthalmy is frequently very tedious, and much more difficult to cure, than the firſt.

Ophthalmies are divided into different kinds, according to the variety in the ſeat of the affection, in its degree of violence, in its duration, in its external ſymptoms, and, more eſpecially, in the cauſes of the complaint. With reſpect to the ſeat of the inflammation, it alſo deſerves notice, that there is no part of the eye which is exempt from the riſk of being inflamed, and that in ſevere ophthalmies, the inflammation extends over the whole eye-ball. In mild caſes, however, one part ſuffers a good deal more, and ſooner, than another. Sometimes it is the interior of the eye, which is alone, or principally affected, being the caſe that has been termed by writers *phlegmone oculi*. In this example the patient uſually experiences a ſhooting pain, extending through the whole globe of the eye to the vicinity of the eye-brows, and occaſioning a ſenſation as if the organ were ready to burſt. Indeed the whole eye-ball ſometimes does appear to be actually ſwelled and dilated. Frequently the pupil is cloſed; the aqueous humour bloody; and the cryſtalline lens rendered opaque. In ſtill more numerous examples, the patient is deprived of the power of viſion, notwithſtanding the pupil be clear and uncontracted. There is little external appearance of redneſs about the eye. But the diſorder rarely continues long in this ſtate, a violent degree of external inflammation moſtly enſuing. The preceding caſe of internal ophthalmy is always attended with great danger of incurable blindneſs.

The effects of ſevere ophthalmy ſometimes extend to the tranſparent cornea, which membrane ſwells, and is rendered ſoft and white; or elſe blood-veſſels are diſtinctly ſeen ramifying upon it; or little bloody effuſions are formed over it. The eye-lids are alſo often affected in ophthalmy. Sometimes it is merely their inner ſurface which is inflamed, in which circumſtance the inflammation is ordinarily very painful. In other inſtances, it is their margins which are chiefly affected, and then ulcerations of the tarſi, and detachment of the ciliæ, not unfrequently enſue. Sometimes the whole eye-lid is inflamed; and in this caſe, it uſually happens that the eye cannot be opened at all, or not without conſiderable difficulty.

The portion of the conjunctiva covering the white of the eye is generally the principal ſeat of ophthalmy, and it may be affected in various ways. Sometimes merely a circumſcribed red ſpot, of different ſizes and ſhapes, is obſervable in one of the corners of the eye, appearing to ariſe from a ſlight

a ſlight effuſion of blood in the cellular ſubſtance underneath the conjunctiva, and in general it changes its ſituation. For inſtance, if it be to day at one of the angles of the eye, to-morrow it will be found at the lower margin of the cornea. Such mild inflammation is often entirely unattended with pain, and in the majority of caſes the uneaſineſs which the patient ſuffers is inſignificant, and in the courſe of a few days ſpontaneouſly diſappears. The uſual exciting cauſes of the complaint are, violent ſtraining in vomiting or coughing, fright, a pointed extraneous body that has fallen into the eye, &c. Sometimes only a plexus of varicoſe veſſels can be ſeen near the external or internal commiſſure, running horizontally towards the cornea. When theſe veſſels do not reach this laſt membrane, the patient has no complaints, excepting a weeping of the eye, and a ſenſation of preſſure, ſeeming as if it proceeded from the lodgment of ſome foreign body under the eye-lids. But, in certain examples, ſome of the veſſels extend over the tranſparent cornea, and then it commonly happens that a cloudineſs accompanies the varicoſe affection of the veſſels, and proves a conſiderable impediment to viſion. This caſe, the *ophthalmia varicoſa* of ſurgical writers, is very obſtinate, and can ſeldom be relieved without an operation: it is for the moſt part a conſequence of violent acute ophthalmy.

Sometimes the white of the eye is interwoven with numerous ſmaller or larger blood-veſſels, either at its whole circumference, or elſe merely in the vicinity of either angle, the veſſels being plainly more or leſs diſtinguiſhable from one another. At the ſame time the patient has a burning ſenſation in his eye, and in general there is a copious effuſion of tears. Though this kind of inflammation is not violent, it is far from being unimportant. The more numerous the red veſſels are, the leſs diſtinct they are from one another; and the more uniformly red the eye appears, the more ſevere is the diſorder. The whole of the white of the eye is ſometimes not only affected with general redneſs, but the conjunctiva is ſwelled in ſuch a degree, that it projects between the eye-lids, and even forms a protruſion beyond them; leaving in the middle of the eye-ball a deep depreſſion, in which the cornea is ſituated; or elſe enlarged in ſuch a manner, that this laſt membrane is totally covered with it. In the latter caſe, the whole eye-ball reſembles a maſs of red fleſh. This ſpecies of ophthalmy, which is termed *chemoſis*, is generally attended with inflammation of all the internal and external parts of the eye, vehement pain, much fever, and imminent danger of ſuppuration. The ſwelling of the conjunctiva ariſes from an actual extravaſation of blood in the cellular membrane underneath it.

With reſpect to the duration of ophthalmies, they are divided into the *acute* and *chronic*. The generality of acute inflammations of the eyes at laſt terminate in the chronic form of the complaint. The attacks both of acute and chronic ophthalmies alternately come on and diſappear at certain times, and the diſorder is then termed *periodical*. All theſe varieties in the courſe of the diſeaſe permit us to draw no inferences which can be depended upon with regard to the proper mode of treatment. The ſame cauſe ſometimes produces an acute, ſometimes a chronic, ſometimes a periodical ophthalmy. Nay, the ſame inflammation of the eyes frequently changes its character, becoming, in turns, acute, chronic, and periodical. From ſuch variations alſo no certain information can be derived with reſpect to the prognoſis. It is occaſionally an unfavourable event, when an acute ophthalmy becomes chronic, while in other inſtances the change from the chronic to the acute form of the complaint is equally bad. Although chronic ophthalmies are generally not attended with much danger of the ſight being deſtroyed, yet they are ordinarily more difficult of cure than acute caſes, becauſe their cauſes are for the moſt part exceedingly complicated, inveterate, and not eaſily detected.

Ophthalmies are likewiſe diſtinguiſhed into ſeveral kinds, by a variety of external appearances. The inflamed eye is ſometimes ſo dry that the cornea is quite hard and ſcaly, and the eye and eye-lids cannot be moved without pain. It is to this caſe that the technical appellation of *xerophthalmia* is applied. Sometimes an extraordinary quantity of tears is diſcharged from the inflamed eye, the diſorder being then named *ophthalmia humida*. The tears may be very acrid and irritating, or entirely free from all hurtful qualities. In particular inſtances the inflamed eye is neither immoderately dry nor moiſt. The ſtimulus of gentle inflammation, operating upon ſecreting organs, increaſes the ſecretion, by increaſing the action of the veſſels; but the ſtimulus of violent inflammation puts a ſtop to ſecretion, probably by producing a ſpaſmodic conſtriction of the ſecerning arteries. Hence dry ophthalmies are always more ſevere than ſuch as are termed humid. It is conſtantly a ſign of mildneſs when the ſecretion of the tears is neither increaſed nor leſſened. Ophthalmies of the dry kind are moſt apt to bring on ſuppuration of the eye; while ſuch caſes as are accompanied with an effuſion of acrid irritating tears are moſt liable to occaſion ulceration of the tranſparent cornea, or of the margins of the eye-lids. Sometimes the inflamed eye is covered with thick purulent matter, which, in the night-time, glues the eye-lids together, a part of it becoming hard, and adhering to the eye-laſhes. This caſe is termed the *ophthalmia purulenta*. In this example, the Meibomian glands at the edges of the eye-lids are particularly affected, and ſecrete the purulent matter. The moſt intereſting diſtinctions of ophthalmy are founded upon the cauſes of the diſeaſe, and of theſe notice will be taken in ſpeaking of the mode of treating particular caſes.

In the treatment of ophthalmy, there are ſeveral indications to be fulfilled. The moſt important one is founded upon the cauſe of the complaint; all the others are of inferior conſequence. When the cauſes are numerous, the curative indications may alſo be ſo. The ſecond moſt material indication is that ariſing from the character of the diſorder, which being inflammatory, of courſe demands antiphlogiſtic treatment. Beſides theſe two principal indications, which the ſurgeon muſt carefully and conſtantly attend to in the cure of ophthalmy, there are others of a collateral nature, depending upon the different appearances of the complaint, the various degrees of violence, the differences in the ſituation of the inflammation, the patient's conſtitution, &c. Although theſe laſt ſhould not interfere with the chief means of cure, they often point out uſeful auxiliary meaſures.

We ſhall follow Richter, and firſt offer ſome general obſervations on the treatment of ophthalmy, and afterwards ſpeak of the mode of curing each particular ſpecies of the diſorder. With the exception of the humid ophthalmy, attended with an effuſion of acrid tears, and chronic caſes unaccompanied with pain, every inflamed eye ſhould be kept from the light and air, which act as ſtimuli, ſo as to increaſe the inflammation, and prove particularly detrimental, the light producing alſo a great deal of pain. The uſual bandage, conſiſting of a compreſs laid over the eye, and faſtened with a fillet, fulfils the intention, but yet it is apt to compreſs and irritate the eye. The compreſs ſoon becomes wet with the tears which are diſcharged, and the eye and adjacent parts are kept continually in a moiſt ſtate, which, in certain ophthalmies, eſpecially the acrid humid caſe, is very hurtful. Richter thinks the propoſal of putting over the

the eye a ſoft bit of ſponge, inſtead of a compreſs, altogether uſeleſs; it is true that the ſponge will not make inconvenient preſſure on the eye, but the organ will be, as it were, in a kind of warm bath. In the majority of inſtances, it is unneceſſary to lay a compreſs upon the eye itſelf; for when the inflammation is of any importance, the edges of the eye-lids very quickly become adherent together. In this circumſtance, it is always preferable to put the compreſs on the forehead, and let it hang down over the eye, care being taken to faſten it with a band, or elſe to pin it to the patient's cap. When the eye-lids are not cloſed, a compreſs muſt be carefully kept on the eye. To this practice, however, there are a few caſes forming exceptions. Beſides guarding the eye from the light and air, it is alſo proper to prevent all motion of the eye and eye-lids, as ſuch motion would evidently irritate the inflamed part. On this account, Richter conceives, that a compreſs, which is merely allowed to hang down over the eye, does not do in every caſe what ought to be done.

Both eyes, even though one only may be inflamed, ought always to be covered in one of the foregoing manners. The ſtimulus of the light upon the ſound eye alſo affects the diſeaſed one, and the latter generally moves together with the former. The compreſs ſhould be frequently changed, becauſe the diſcharge would ſoon render it hard and ſtiff, in which ſtate it would prove offenſive to the eye. Sometimes the eye-lids adhere ſo cloſely together, that the tears cannot eſcape, ſo that they accumulate under theſe parts, which become prodigiouſly diſtended, and hang down in the form of a pouch. This caſe is not of frequent occurrence; but it does occaſionally happen, and may be miſtaken by an incautious ſurgeon for an œdematous ſwelling of the eye-lids. If the eye-lids be ſeparated a little from each other at the internal angle, the confined tears will flow out in a ſmall ſtream, and the ſwelling of the eye-lids immediately ſubſide. This expedient muſt be adopted every day, and even repeatedly, eſpecially when the tears are ſharp and irritating.

Sometimes in ophthalmies the upper eye-lid ſwells in ſuch a degree, that it hangs down and covers the whole, or the greater part of the lower one. In theſe caſes, eſpecially when the inflammation is of a certain kind, a quantity of viſcid, tough, thick matter accumulates underneath the upper eye-lid upon the external ſurface of the lower one, and very ſoon becomes ſo acrid and irritating, that it materially tends to keep up the effuſion of tears, burning and ſhooting pains, and even the inflammation and ſwelling of the eye-lid itſelf. The globe of the eye is likewiſe liable to be injured by ſuch a collection of diſcharge. In caſes of this ſort, it is not an unimportant rule to raiſe the upper eye-lid occaſionally, and waſh away the diſcharge accumulated under it. By this means, the patient uſually experiences conſiderable relief of all his unpleaſant ſenſations. Opening the adherent eye-lids, in caſes of ophthalmy, requires ſome care, in order that the eye may not be irritated or otherwiſe hurt, particularly when the inflammation is the conſequence of a ſurgical operation. In general, it will be found that merely the eye-laſhes ſtick to the ſkin of the lower eye-lid, and conſequently that, for the purpoſe of opening the eye, nothing more is neceſſary than to looſen the above hairs. The object can be beſt fulfilled by ſoftening the diſcharge, which makes the eye-laſhes adhere, with a little warm milk, or milk and butter, and then lifting them up with the end of a probe. When this is done, the eye may uſually be opened with the utmoſt facility.

Beſides the means of cure required by the foregoing indications, in caſes of ophthalmy, external topical applications may be employed with advantage. Theſe are beſt in the form of an eye-water, or collyrium. Powders, blown or ſprinkled into the eye, always produce irritation. Salves will not readily remain in contact with the eye, which is moſtly ſurrounded with aqueous ſecretions: they only remain applied to the eye-laſhes and ſkin of the eye-lids; and they are attended with the inconvenience of being liable, unleſs quite recently prepared, to produce redneſs, pain, and heat. Earthy indiſſoluble ingredients, alſo, ſhould never be put into collyria; for they remain in the eye after the employment of theſe applications, and always occaſion a degree of irritation. It appears to Richter, that the ordinary mode of uſing lotions for the eye by wetting compreſſes, and laying theſe over the ſhut eye-lids, is ineffectual and hurtful. Ineffectual, becauſe, ſays this writer, how can the operation of a collyrium extend to the globe of the eye through the eye-lids, which are frequently very much thickened and ſwelled? Hurtful, becauſe the wet compreſs ſoon becomes warm, and warm moiſt applications do harm to ſeveral kinds of ophthalmy. Whenever the compreſs becomes dry, it is rendered hard and ſtiff, and in this ſtate it irritates and diſturbs the eye. The beſt plan is to inſinuate a few drops of the collyrium into the inner angle of the eye, while the patient lies upon his back. Thus, the application not only comes into contact with the parts on which it is to act, for it ſpreads over the whole eye-ball towards the external angle, eſpecially when the patient moves the eye-lids, and turns his head ſideways, but it alſo continues a certain time upon the affected parts, if the patient be kept upon his back, and a few freſh drops be every now and then introduced.

Particular caſes occur, in which the inflamed eyes are benefited by no wet topical applications. Such deviations from what is common cannot always be diſcovered *à priori*. A ſhort trial ſoon evinces the powerful effect of this deſcription of local remedies, and the neceſſity of abſtaining from them. All external applications muſt now be left off, or only ſuch as are dry employed. Richter mentions a mixture of camphor, elder flowers, and chamomile, in little bags, as being an uſeful remedy in theſe peculiar examples.

Moſt of the external applications employed in caſes of ophthalmy, admit of being divided into two kinds, diſcutients, aſtringents, and ſoothing emollients. Acute ophthalmies in the incipient ſtage, while bleeding has not been ſufficiently practiſed, and the eyes are yet very painful, will not bear the firſt claſs of remedies, which, acting as ſtimulants, would increaſe the pain and inflammation. But, in proportion as the pain ſubſides, and the neceſſity for bleeding diminiſhes, and as the inflammation aſſumes a chronic nature, ſuch applications become more uſeful. The more painful and acute the ophthalmy is, the more proper are the topical remedies of the ſecond claſs. Certain ophthalmies, alſo, which are not very violent and acute, but which are attended with conſiderable ſenſibility in the eyes, require the uſe of ſoothing applications. On the other hand, the greater the degree of redneſs and ſwelling in the inflamed eye, provided the pain be moderate, the more ſtrongly are tonics and aſtringents indicated. Ophthalmies, accompanied with a copious diſcharge of acrid tears, are moſt benefited by emollient allaying remedies. Sometimes inflamed eyes appear to derive no good from any kind of external applications whatſoever.

As Richter obſerves, there are caſes in which the ſurgeon foreſees the diſorder, and by timely prophylactic meaſures has it in his power to prevent, or, at all events, leſſen it. Such inſtances particularly occur in ſurgical operations upon the eyes. Here inflammation is always to be expected, and

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it not unfrequently proves a cauſe of the ill ſucceſs of the operation. The ſole deſign of all preparatory treatment adopted before the latter proceeding, is to leſſen and prevent the apprehended inflammation. With this view, it was once the cuſtom to keep the patient a certain time on a low debilitating diet, to hinder him from taking the air, to exhibit weakening aperient neutral ſalts, and even to have recourſe to veneſection. By ſuch means, the irritability of the patient was increaſed, and, of courſe, the enſuing inflammation, and all its bad effects, were aggravated. Beſides, the long formal preparation tended to increaſe the alarm which the patient generally felt before the operation was undertaken; while perſiſting in the exhibition of aperient ſalts checked the ſecretion from the ſkin, weakened the ſtomach and bowels, and diſpoſed the patient to gaſtric complaints, which were ſure to have an unfavourable effect upon the conſequences of the operation. Repeated experience proves, ſays Richter, that operations on the eyes are performed with moſt ſucceſs upon patients who are ſtrong, hardy, healthy, and little irritable, and who have not ſubmitted to any of the above preparatory treatment. The only things which can be of uſe before the operation conſiſt in endeavouring to quiet the patient's apprehenſions, by repreſenting what is about to be done as ſafe, and by no means very painful; in not keeping the patient a long while in fearful expectation of the operation; in letting the patient take exerciſe in the open air; in giving him antimonials in order to promote perſpiration, by which means the riſk of inflammation will be materially leſſened; and laſtly, in adminiſtering an opiate, half an hour before the operation, when the patient ſeems reſtleſs. Theſe directions, however, are only applicable to caſes in which the patient is, in other reſpects, quite healthy; for it is eſſentially neceſſary to obviate any other diſeaſes, or defects, which may prevent the ſucceſs of the operation. (See Richter's Anfangſgr. band iii. kap. 1.) From theſe general obſervations we ſhall next proceed to the conſideration of each particular ſpecies of ophthalmy.

*Of the mild acute Ophthalmy.*—This form of the complaint is characteriſed by redneſs of the conjunctiva and lining of the eye-lids, an unnatural ſenſation of heat in the eyes, uneaſineſs, itching and ſhooting pains, as if particles of ſand had got between the palpebræ and the eye-ball. At the place where the pain ſeems to be moſt ſevere, there are ſome blood-veſſels which appear more turgid and prominent than other veſſels of the ſame claſs. The patient of his own accord keeps his eye-lids cloſed; for he feels a wearineſs and reſtraint in opening them, and, by ſhutting them, he alſo moderates the action of the light, to which he cannot expoſe himſelf, without increaſing the burning ſenſation, lancinating pain, and effuſion of tears from the eye. If the conſtitution is irritable, the pulſe will be a little accelerated, particularly towards the evening; the ſkin will be dry, ſlight ſhiverings will occur, and, in ſome inſtances, naufea and inclination to vomit. See Scarpa's Oſſervazioni ſulle Principali Malattie degli Occhi. cap. 7.

This complaint is often the conſequence of a cold, in which the eyes, as well as the pituitary cavities, fauces, and trachea, are affected. It is not unfrequently occaſioned by change of weather, ſudden tranſitions from heat to cold, the prevalence of eaſterly winds, journies through damp unhealthy ſandy countries in the hot ſeaſon of the year, expoſure of the eyes to the vivid rays of the ſun, &c. Hence, as Scarpa has judiciouſly remarked, it does not ſeem extraordinary that it ſhould often make its appearance as an epidemic, and afflict perſons of every age and ſex. Beſides the preceding remote cauſes of ophthalmy, authors have enumerated, as others, the ſuppreſſion of ſome habitual evacuation, ſuch as bleedings from the noſe, or piles, ſtoppage of the menſes, &c. Alſo affections of the primæ vitæ, worms, dentition, &c.

The mild acute ophthalmy may, in general, be eaſily cured by means of low diet, gentle purging with ſmall repeated doſes of the antimonium tartarizatum, and after making ſearch for any extraneous body that may have inſinuated itſelf beneath the eye-lids, repeatedly waſhing the eye with a warm decoction of mallow leaves, and covering it with any very ſoft emollient poultice, which ſhould be included in ſmall bags of fine muſlin. Scarpa thinks the fluid remedy may be moſt conveniently applied by means of an eye-glaſs. He orders the antimonium tartarizatum to be taken as follows: ℞ Antim. tart. gr. j. Decocti hordei lbiſs cryſtal. Tart. ʒi. Sacchari purif. ʒvj. Miſce. This quantity is to be taken in divided doſes, every day. Scarpa, inſtead of the barley water, preſcribes the decoction of dog-graſs, which does not appear to us to be eſſential.

Under this treatment, the inflammatory ſtage of the mild acute ophthalmy commonly ceaſes in the courſe of four or five days. The patient no longer complains of that oppreſſive ſenſe of heat, tenſion, throbbing, &c. previouſly experienced, and he can now bear a moderate light, without ſo profuſe a diſcharge of tears, as uſed previouſly to be the conſequence. In this ſtate, how red ſoever the tunica conjunctiva may appear, it is no longer affected with acute inflammation, and the ophthalmy has relapſed from its acute ſtage into that attended with relaxation and weakneſs of the veſſels of the conjunctiva and membranous lining of the eye-lids. Emollients are now improper; in lieu of them, aſtringent corroborant collyria ſhould be uſed, by means of which the relaxed veſſels of the conjunctiva and eye-lids will recover their original tone, and the ophthalmy be totally removed. One of the following eye-waters, which are ſimilar in quality to thoſe directed by profeſſor Scarpa, may be employed. ℞ Zinci ſulphatis gr. v. Aquæ roſæ ʒiv miſce. Vel plumbi ſuperacetatis gr. viij. Aquæ fœniculi ʒvj. Spir. camphorati ♏ x miſce. The mild ophthalmy, originating from cauſes which render it an epidemic, ſo quickly paſſes through the firſt inflammatory ſtage, that this ſtage is ſcarcely obſervable, and, according to Scarpa, it is the only caſe in which cold aſtringent applications are immediately neceſſary.

*Of the ſevere acute Ophthalmy.*—The ſevere acute ophthalmy is attended with the ſame deſcription of ſymptoms as the mild, but in a more aggravated form. The ſenſation of heat in the eyes is burning; the conſtriction of the whole eye-ball and eye-lids ſpaſmodic; the preſence of even a faint light intolerable. Sometimes the effuſion of tears is continual, very copious, and blended with mucus, which is apt to make the eye-lids adhere together. Sometimes this ſecretion is almoſt ſuppreſſed, and the eyes become preternaturally dry. The ſympathetic fever is conſiderable, with reſtleſſneſs and intolerable pain about the back part of the head. The pupil is contracted; the conjunctiva of an uniformly deep red colour. On the anterior hemiſphere of the eye, amongſt the moſt prominent faſciculi of veſſels, may be diſtinguiſhed a delicate vaſcular network, continued from one faſciculus to another; but all being equally turgid with blood, and coiled as it were together, ſeem to form a kind of excreſcence, which riſes above the ſurface of the eye, and has a tendency to project forwards beyond the eye-lids.

From the immoderate action of the inflamed veſſels, blood is occaſionally extravaſated into the cellular ſubſtance, connecting the tunica conjunctiva with the ſclerotica. Hence the firſt of theſe membranes, which is naturally looſe, becomes enormouſly extended, and elevated in front of the eye,

eye, ſo as to make the tranſparent cornea ſeem quite ſunk, and prevent the eye from being completely ſhut. *Chemoſis* is the term uſually applied to this ſort of caſe.

The ſevere acute ophthalmy generally affects only the outer part of the eye-ball; but ſometimes the interior of the eye is alone affected, or, at all events, more ſo than the exterior. There is little change in the external parts, the patient ſuffers extreme pain on expoſing his eye to the fainteſt light; the iris has a red appearance; the pupil is exceedingly contracted; and the aqueous humour is occaſionally red and turbid. From theſe circumſtances, Scarpa thinks it not irrational to ſuſpect, that in the higheſt degree of internal ophthalmy, there may be an extravaſation of blood in the chambers of the eye, eſpecially betwixt the choroid and ſclerotic coats. Hence may ariſe the termination of the internal ophthalmy in amauroſis, ſo common when the caſe does not end in ſuppuration.

The ſevere acute ophthalmy demands the moſt rigorous adoption of the antiphlogiſtic treatment. Tardineſs in procuring evacuations, eſpecially of blood, too often gives the diſeaſe time to advance to the ſtate of chemoſis; or elſe to a condition in which ſuppuration, or an extravaſation of lymph within the eye, is threatened; while, in other inſtances, the inflammation degenerates into an obſtinate chronic ophthalmy, ariſing from the exceſſive weakneſs produced in the veſſels of the conjunctiva. Both general and topical blood-letting ſhould therefore be ſpeedily practiſed. Leeches ſhould be applied to the vicinity of the eye-lids, eſpecially, ſays Scarpa, about the inner canthus, on the vena angularis, where it joins the frontal, deep orbitar, and tranſverſe vein of the face. See Saggio di Oſſervaz. &c. cap. 7.

Mr. Ware objects to leeches being put on, or very near the eye-lids, as they have ſometimes cauſed a conſiderable ſwelling of thoſe parts, and increaſed inſtead of leſſening the irritation. In ordinary caſes, this gentleman recommends applying three in the hollow of the temple, about an inch and a half from the outer part of the orbit. There is one mode of bleeding, in caſes of ophthalmy, perhaps productive of more benefit than any other, and this probably on account of its acting at once both as a general and topical application; the plan alluded to is that of opening the temporal artery.

There is another method of bleeding, which deſerves to be particularly noticed, as having frequently proved ſuperiorly efficacious. The viſible blood-veſſels on that part of the conjunctiva, which covers the inſide of the eye-lids, are much more numerous than thoſe which are obſervable on the white of the eye. Hence, in ophthalmy, the inflammation ſeems greateſt on the inſide of the eye-lids, where the blood-veſſels are often not only much increaſed in number, but are alſo extremely full and turgid. Sometimes alſo the whole inſide of the eye-lids, particularly of the lower one, is ſo much enlarged as to be conſtantly turned outward. In both theſe caſes great benefit has been derived from ſcarifying the inner ſurface of theſe parts with a lancet, by which means a conſiderable quantity of blood has been removed. When the upper eye-lid is very œdematous in ophthalmy, and its thickneſs prevents the application of remedies to the eye, a few punctures made in the outſide of the ſwelled part, near its edge, will let out a quantity of bloody water, and materially leſſen the ſwelling. When the tumefaction of the everted eye-lids is very conſiderable, great and ſpeedy relief has often been given, by cutting off a piece of the inſide of thoſe parts with a pair of curved ſciſſars. Ware on Ophthalmy, p. 39, 40.

General bleeding, though copious, and aſſiſted by the topical application of leeches, does not always prove adequate to the removal of the high degree of inflammation attendant on chemoſis. It is expedient to employ additional means, in order to give exit to the blood effuſed in the cellular ſubſtance, between the conjunctiva and ſclerotica, and raiſing the firſt of theſe membranes ſo much above the level of the cornea. With this view Scarpa recommends making a circular inciſion in the conjunctiva near the margin of the cornea, with a pair of curved ſciſſars. As a lancet, however, makes a cleaner cut, it is perhaps preferable for the operation, and ſcarifications might ſuffice both for the diſcharge of the extravaſated blood, and of that diſtending the veſſels of the conjunctiva itſelf. But, according to Mr. Ware, there cannot be an eaſier, nor a more effectual remedy in chemoſis, than æther. A few drops are to be poured into the palm of the hand, and diffuſed over it, which may be immediately done by preſſing the other hand againſt it. The hand is then to be applied to the eye, and kept ſo cloſe to it that the ſpirit, as it evaporates, may inſinuate itſelf into the part affected, and bring about the abſorption of the extravaſated blood. In a few inſtances of chemoſis, in which the ſwelling and inflammation have been conſiderable, Mr. Ware has found the following application of ſingular ſervice: ℞ Interiorum foliorum recentium lactucæ ſiſſilis ℥iij. Coque cum aquæ puræ ℥ſs in balneo mariæ pro ſemihorâ; tunc exprimatur ſuccus, et applicetur paululum ad oculos et ad palpebras ſæpe in die.

After general and topical bleeding, aperient medicines of the moſt gentle kind ſhould be adminiſtered; ſoda phoſphorata, pulp of tamarinds, potaſſæ ſupertartras, and magneſiæ ſulphas, are the moſt proper. When the ſtomach is affected, Scarpa alſo recommends an emetic, as being of ſingular ſervice in caſes of ophthalmy.

When bleeding and other evacuations have been practiſed, the next moſt uſeful meaſure is the application of a bliſter to the nape of the neck. Scarpa obſerves that the integuments in this ſituation, and behind the ears, ſympathize more cloſely with the eyes than any other part of the ſkin does. Many practitioners, however, and among them Mr. Ware, prefer bliſtering the temples. The latter ſays, "when the leeches have fallen off, and the conſequent hemorrhage has ceaſed, I would adviſe a bliſter, of the ſize of half-a-crown, to be applied to the temples, directly over the orifices made by the leeches; and I have found that the ſooner the bliſter has followed the bleeding, the more efficacious both have proved." When the ophthalmy has been very violent, and reſiſted the common method, Mr. Ware adds, that the moſt beneficial effects have alſo been ſometimes produced by the application of a bliſter large enough to cover the whole head. P. 43, 44.

At firſt, topical emollient applications to the eye are moſt beneficial; ſuch as mallows boiled in new milk, bread and milk poultices, or the ſoft pulp of a baked apple; all included in fine little muſlin bags. Remedies of this deſcription ſhould be renewed at leaſt every two hours. The patient ſhould be directed to obſerve perfect quietude, and to lie with his head in an elevated poſition. To keep the eye-lids from adhering together in the night time, the ſpermaceti cerate is proper. When the ophthalmy is accompanied with a violent pain in the head, Mr. Ware recommends a ſtrong decoction of poppy heads to be applied as a fomentation. P. 51.

Under the preceding plan of treatment, the acute ſtage of ſevere ophthalmy uſually abates in the courſe of a week. The burning heat, and darting pains in the eyes, and the febrile diſturbance of the conſtitution, all ſubſide. The patient is comparatively eaſy, and regains his appetite. The eye-lids loſe their tenſion and wrinkle. A diſcharge of thick

matter

matter takes the place of a ſecretion of thin ſerum, or of a preternatural dry ſtate of the eyes. Theſe organs can now be opened, without experiencing vaſt irritation from a moderate light. In this ſtate, notwithſtanding the eyes may continue red, and the conjunctiva ſwollen, all evacuations are to be left off, as well as the uſe of topical emollients. For theſe latter, aſtringent corroborant collyria are to be ſubſtituted. Scarpa recommends the following application: ℞ Zinci ſulphatis gr. vj. Aq. diſtillatæ ℥vj. Mucil. ſem. cydon. mali ℥j. Spirit. camphor. guttas paucas. Miſce et cola. This collyrium may be injected with a ſyringe, between the eye and eye-lids, once every two hours; or, if the practitioner prefer the method, the eye may be bathed in the lotion by means of an eye-cup. Such perſons as cannot bear cold applications to the eye, muſt have the ſame kind of collyrium a little warmed; but it may be uſed cold, as ſoon as the irritability begins to decreaſe.

The tinctura thebaica of the old London Diſpenſatory proves a moſt efficacious remedy for the ſecond ſtage of acute ophthalmy, or that connected with weak vaſcular action in the part affected. Two or three drops may be introduced, between the eye-lids and globe of the eye, twice a day in common caſes; but in others, attended with more ſenſibility, once will at firſt be ſufficient. Mr. Ware, who brought this application into repute, has found, that introducing two or three drops of this medicine at the inner canthus, and making them glide gradually over the eye, by gently drawing down the lower eye-lid, proves equally beneficial, and leſs painful, than dropping them at once on the eye-ball. Immediately the application is made, it generally creates a copious flow of tears, a ſmarting pain, and a ſenſe of heat in the eyes, which inconveniences, however, ſoon ceaſe, and the eyes become clearer, and feel evidently improved. It ſhould be well underſtood, that the tinctura thebaica may be uſed too extenſively; and that it is only proper for caſes, in which the acute ſtage of the diſorder has been previouſly leſſened by blood-letting, aperient medicines, and bliſters. Scarpa has expreſsly pointed out, that it is a remedy, which is uſeful only when the violence of the pain and the inability to bear the light are abated.

Whenever the patient can eaſily bear a moderate degree of light, all coverings ſhould be removed from the eyes, except a ſhade of green or black ſilk. A brighter light ſhould be gradually admitted every day into his chamber; ſo that he may become habituated as ſoon as poſſible to the open day-light. Nothing, ſays the judicious Scarpa, has a greater tendency to keep up and increaſe the morbid irritability of the eyes, than keeping them unneceſſarily long in a dark ſituation, or covered with compreſſes and bandages.

*Purulent Ophthalmy of Children.*—This ſpecies of ophthalmy produces ſuch a ſwelling of the eye-lids, as almoſt entirely prevents their ſeparation from each other. Should the ſurgeon obtain a view of the membrane lining them, it will be found to be wrinkled, and converted into a red villous ſurface, ſomewhat like the inner coat of the rectum, when protruded in young children. (Warner on the Human Eye, p. 42.) Sometimes in the child's fits of crying the eye-lids become everted, and continue ſo, until rectified by an attendant. No ſooner is the firſt ſhort attack of inflammation paſt, than a diſcharge of thick yellow matter enſues, truly ſurpriſing in quantity, partly ſecreted by the Meibomian glands, but chiefly by that villous, fungus-like ſurface, into which the lining of the palpebræ ſeems converted. If the eye-lids admit of being opened, the matter may be ſeen diffuſed over the whole ſurface of the eye; and its confinement between the ſwelled eye-lids and the eye-ball contributes ſtill more to aggravate the pain, increaſe the inflammation, and often induce ulcers, or ſpecks, either over a part or the whole of the cornea. If a ſpeedy check be not ſoon put to this diſtreſſing malady, it frequently renders the cornea ſo opaque and thickened, as to form what is termed *ſtaphyloma*. (See this word.) The cornea has even been known to burſt, the humours to be diſcharged, and the eye to ſink in the orbit. The febrile ſymptoms are at firſt ſevere; the infant is continually fretful and reſtleſs, and a diarrhœa is not unfrequently concomitant. The affection of the eyes is occaſionally accompained with eruptions on the head, and with marks of a ſcrofulous conſtitution. Ware, p. 138. &c.

The antiphlogiſtic treatment ſhould be quickly oppoſed to the progreſs of the diſeaſe. The temporal arteries ſhould be opened, or leeches applied to the temples, or neighbourhood of the eye-lids, and a bliſter put on the nape of the neck or temples. The child ſhould be kept in a cool room, and not covered with much clothes. If no diarrhœa ſhould prevail, it is proper to purge with a little rhubarb, or magneſia, in ſyrup of violets.

A ſurgeon is ſeldom called in before the firſt ſhort inflammatory ſtage has ceaſed, and an immenſe diſcharge of matter from the eyes has commenced. Of courſe, emollient applications are generally improper. Aſtringents and corroborants are immediately indicated, in order to reſtore to the veſſels of the conjunctiva and eye-lids their original tone, to rectify the villous and fungous appearance of the lining of the palpebræ, and thus finally to check the morbid ſecretion of matter. For this purpoſe, Mr. Ware ſtrongly recommends the aqua camphorata of Bates's Diſpenſatory: ℞ Cupri vitriolati. Bol. Armen. ā ā ℥iv. Camphoræ ℥j. M. & f. pulvis, de quo projice ℥j. in aquæ bullientis Ibiv. amove ab igne, et ſubſidant fæces. Mr. Ware, in his late Remarks on Purulent Ophthalmy, 1808, obſerves, that he uſually directs the aqua camphorata, as follows: ℞ Cupri vitriolati. Bol. Armen. ā ā gr. viij. Camphoræ gr. ij. Miſce, et affunde aquæ bullientis ℥viij. Cùm lotio ſit frigida, effundatur limpidus liquor, et ſæpiſſimè injiciatur paululum inter oculum et palpebras. This remedy poſſeſſes a very ſtyptic quality; but it is much too ſtrong for uſe, before it is diluted; and the degree of its dilution muſt always be determined by the peculiar circumſtance of each caſe. Mr. Ware ventures to recommend about one dram of it to be mixed with an ounce of cold clear water, as a medium or ſtandard, to be ſtrengthened or weakened as occaſion may require. (P. 143.) The remedy muſt be applied by means of a ſmall ivory or pewter ſyringe, the end of which is a blunt-pointed cone. The extremity of this inſtrument is to be placed between the edges of the eye-lids, in ſuch a manner, that the medicated liquor may be carried over the whole ſurface of the eye. Thus the matter will be entirely waſhed away, and enough of the ſtyptic medicine left behind to interrupt and diminiſh the exceſſive diſcharge. According to the quantity of matter, and the rapidity with which it is ſecreted, the ſtrength of the application, and the frequency of repeating it, muſt be regulated. In mild recent caſes the lotion may be uſed once or twice a-day, and rather weaker than the above proportions; but in inveterate caſes, it is neceſſary to apply it once or twice every hour, and to increaſe its ſtyptic power in proportion; and when the complaint is ſomewhat relieved, the ſtrength of the lotion may be leſſened, and its application be leſs frequent.

"The reaſons for a frequent repetition of the means juſt mentioned, in bad caſes, are, indeed, of the moſt urgent nature. Until the conjunctiva is ſomewhat thinned, and the quantity of the diſcharge diminiſhed, it is impoſſible to know

know in what ſtate the eye is; whether it is more or leſs injured, totally loſt or capable of any relief. The continuance or extinction of the ſight frequently depends on the ſpace of a few hours: nor can we be relieved from the greateſt uncertainty, in theſe reſpects, until the cornea becomes viſible." Ware, p. 145.

This gentleman, with every appearance of reaſon, condemns the uſe of emollient poultices, which muſt have a tendency to increaſe the ſwelling and relaxation of the conjunctiva. If poultices are preferred, he particularly recommends ſuch as poſſeſs a tonic or mild aſtringent property; as one made of the curds of milk, turned with alum, and an equal part of unguentum ſambuci, or axungia porcini. This is to be put on cold, and frequently renewed, without omitting the uſe of the injection. Ware, p. 147.

When the ſecreted matter is glutinous, and makes the eye-lids ſo adherent together, that they cannot be opened, after being ſhut for any length of time, the adheſive matter muſt be ſoftened with a little freſh butter mixed with warm milk, or by means of any other ſoft oleaginous liquor, after the poultice is taken off, and before uſing the lotion. P. 147.

If the everſion of the eye-lids only occurs when the child cries, and then goes off, nothing need be done in addition to the above means. When, however, the everſion is conſtant, the injection muſt be repeated more frequently than in other caſes; the eye-lids put in their natural poſition after its uſe; and an attendant directed to hold on them, with his finger, for ſome length of time, a compreſs dipped in the diluted aqua camphorata. P. 148.

In ſome caſes, when the inſide of the eye-lids has been very much inflamed, the tinctura thebaica, inſinuated between the eye and eye-lids, has been uſeful. If, after the morbid ſecretion is checked, any part of the cornea ſhould be opaque, the unguentum hydrargyri nitrati, melted in a ſpoon, and applied accurately on the ſpeck, with a fine hair pencil; or Janin's ophthalmic ointment, lowered and uſed in the ſame manner; may produce a cure, if the opacity be not of too deep a kind. When the local diſeaſe ſeems to be kept up by a bad habit, alteratives ſhould be exhibited, ſuch as the æthiops mineralis, or ſmall doſes of calomel.

*Purulent Ophthalmy in adult Subjects.*—There is another kind of purulent ophthalmy to which adults are ſubject, and which is ſo generally repreſented by the beſt modern authors, as ariſing from two very peculiar cauſes, *viz.* the ſuppreſſion of a gonorrhœa, and the inadvertent application of the matter of gonorrhœa to the eyes, that we feel it to be our duty not to paſs over the caſe in ſilence.

The diſeaſe produces rather a ſwelling of the conjunctiva, than of the eye-lids. This tumefaction is quickly followed by a diſcharge of a yellow greeniſh matter, ſimilar to what iſſues from the urethra in caſes of clap. Heat and pain in the eyes, great averſion to light, and, in ſome inſtances, an appearance of hypopium in the anterior chamber, are ſymptoms which accompany the complaint. When the diſorder proceeds from the application of the infectious matter to the eyes, it is alleged to be of a leſs ſevere kind.

With reſpect to the caſe, aſſerted to originate from a ſuppreſſion of a diſcharge from the urethra, the method commonly adopted by ſuch practitioners as place implicit reliance in the aſſigned cauſe, is to inject into the urethra warm oil, introduce bougies, and apply poultices to the perineum, with a view of renewing the diſcharge from the paſſage. However, the rarity of the complaint, upon the ſudden ſtoppage of a gonorrhœa; the poſſibility of an ophthalmy ariſing as well at this, as at any other period, quite independently of the urethral affection; and the fallacious nature of any inference deduced from the ſuppoſed reſemblance of the diſcharge from the eyes to that from the urethra, are circumſtances which cannot fail to raiſe in a diſcerning mind a degree of doubt concerning the reality of the imputed cauſe. Cooper's Firſt Lines of Surgery, p. 316. edit. iii.

The treatment of the purulent ophthalmy in adult ſubjects, from what cauſe ſoever it may ariſe, conſiſts in adopting at firſt antiphlogiſtic means, applying emollient remedies to the eyes, and a bliſter to the temple, or nape of the neck. The eyes may be frequently fomented with a decoction of white poppy-heads, and warm milk may be repeatedly injected beneath the eye-lids. In order to prevent the eye-lids from adhering together, the ſpermaceti cerate may be ſmeared upon the edge of each tarſus every night at bed-time.

When the heat and pain in the eyes, and the febrile ſymptoms are diminiſhed; when an abundant diſcharge of pus has commenced; all topical emollient applications are to be relinquiſhed, and the following collyrium made uſe of: ℞ Aq. roſæ ʒx. Hydrarg. oxymuriatis gr. j. Miſce. Scarpa affirms, that in the ophthalmy originating from the inadvertent communication of gonorrhœal matter to the eyes, applications in the form of ointment, ſuch as Janin's ung. ophthalmicum, or the ung. hydrarg. nitrat., are more efficacious than fluid remedies.

*Of the epidemic purulent, or Egyptian Ophthalmy.*—The ſpecies of ophthalmy about which we ſhall next offer a few obſervations, has received the laſt of the above appellations, in conſequence of its having been ſuppoſed to reſemble that kind of inflammation of the eyes, which deſtroyed the ſight of a conſiderable number of our ſoldiers in Egypt in the year 1801, or rather in conſequence of the opinion, that it is a peculiar ophthalmy, which was firſt brought from that country into England by the troops which returned from the celebrated Egyptian expedition. Mr. Ware, however, does not approve of calling this ophthalmy *Egyptian*, becauſe, ſays he, an ophthalmy, preciſely ſimilar in its ſymptoms and progreſs, has appeared long ago in this and other countries, and in Egypt, as well as England, ſeveral varieties of ophthalmy prevail. This gentleman prefers naming the epidemic inflammation of the eyes *purulent*, ſince one of its chief ſymptoms, and that which diſtinguiſhes it from every other, is the profuſe diſcharge of a purulent-coloured fluid. This caſe is very different from an ophthalmy, which, at various times, has been epidemic in this and other countries, without any purulent diſcharge from the eyes, which is ſeldom dangerous to ſight, and in a few days generally yields to internal antiphlogiſtic means, and mildly aſtringent applications. Ware on the Epidemical Purulent Ophthalmy, note p. 3. 1808.

Few ſurgeons have ſeen more of this diſtreſſing diſeaſe than Mr. George Peach, ſurgeon to the 9th regiment of light dragoons, and formerly ſurgeon to the 2d battalion of the 52d regiment of foot, a corps in which the Egyptian ophthalmy prevailed in a ſurpriſing degree.

According to this gentleman, the patient complains, in the firſt ſtage of the diſeaſe, of being ſuddenly ſeized with a rolling of ſand in his eye; the veſſels on the albuginea become ſuddenly turgid with blood, and the lower palpebræ very vaſcular. The caſes treated in this recent ſtate generally yield. But, if very active meaſures do not arreſt the progreſs of the diſeaſe, the ſecond ſtage appears, when the palpebræ ſuperiores become much enlarged; the eye-lids can only be opened with extreme difficulty, and then either a ſcalding fluid is diſcharged and excoriates the face,

or a flux of thick yellow matter takes place. In this ſtate, it is frequently in our power to ſtop the progreſs of the evil; but if the moſt decided and active practice be not adopted, the diſeaſe reaches the third ſtage, in which every thing is ſeldom of little avail in relieving the moſt diſtreſſing ſymptoms. The cornea now too often becomes ulcerated, and the eye ruptured.

On the firſt appearance of the diſeaſe, Mr. Peach had recourſe to veneſection, and the antiphlogiſtic treatment. Being unſucceſsful, he tried bark and ſtimulants; but being ſtill more unſucceſsful with this mode of treatment, he reverted to the antiphlogiſtic plan in its fulleſt extent, and with the greateſt ſucceſs, and he found, that he did not formerly ſucceed, becauſe he did not carry this mode far enough. It is in the commencement of the diſeaſe that a very large quantity of blood ſhould be taken away: in that ſtage, large veneſection, even *ad deliquium animi*, is almoſt an infallible remedy. It is not ſufficient to take away twenty or thirty ounces of blood. Mr. Peach has often taken away ſixty, at the ſame time enjoining perfect reſt, the avoidance of all animal food, and putting in practice every other part of the antiphlogiſtic treatment. The complaint is naturally diſpoſed to relapſe, and as often as the diſeaſe, or even the ſlighteſt pain, or uneaſineſs in the eye, returns, ſo often did this gentleman return to the lancet. Such practice, Mr. Peach confeſſes, is likely to excite aſtoniſhment; but the fulleſt trial of it has demonſtrated to him its utility. In many of the caſes, which occurred to him, the progreſs of the inflammation was ſo rapid, that it probably would have totally deſtroyed the eye, if only the ordinary mode of treating ophthalmy had been reſorted to. He adviſes particular attention to be paid to the firſt ſenſation of ſand in the eye: he never defers veneſection, when this is complained of; and the patient, in general, finds ſo much advantage during the operation, that he ſays, "the ſand is removed." Mr. Peach has occaſionally found advantage ariſe from dropping the undiluted aqua litharg. acetat. into the eye, though great pain was the immediate effect of its application. On the whole, however, he concludes, that dropping ſubſtances into the eye is not ſerviceable, and ſays, that, ſince this practice was relinquiſhed, the eye-lids have not been ſo often inverted. The bowels muſt be kept open. Benefit has often been derived from ſhaving the head, and keeping it continually wet with water, or vinegar. Bliſters are alſo ſometimes indicated; but the great reliance is to be put in the ſtricteſt antiphlogiſtic regimen, and copious veneſection. See Edinb. Med. and Sur. Journal, for January, 1807.

With regard to the cauſes of the epidemic purulent ophthalmy, Mr. Ware ſeems to think, that the complaint is moſtly communicated by contact. Some of the worſt caſes of the purulent ophthalmy of children have happened in thoſe, whoſe mothers were ſubject to an acrimonious diſcharge from the vagina at the time of parturition. Some of the worſt forms of the purulent ophthalmy in adults have occurred in thoſe, who, either ſhortly before the attack of the ophthalmy, or, at that very time, laboured either under a gonorrhœa, or a gleet. Mr. Ware does not mean to impute every purulent ophthalmy to ſuch a cauſe; but in the majority of adults whom he has ſeen affected, if the diſorder had not been produced by the application of morbid matter from a diſeaſed eye, it could be traced to a connection between the ophthalmy and diſeaſe of the urethra. Other cauſes, Mr. Ware acknowledges, may contribute to aggravate, and, perhaps, produce the diſorder, and the purulent ophthalmy in Egypt has been attributed to a great number. The combined influence of heat and light, of a burning duſt continually raiſed by the wind, and of the heavy dews of the night, may powerfully tend to excite inflammations of the eyes. Yet ſomething more muſt operate in cauſing the malignant ophthalmy now under conſideration; for the ſame cauſes operate with equal violence in ſome other countries beſides Egypt, and yet do not produce the ſame effect; and in this country, (continues Mr. Ware,) the diſorder prevailed during the laſt ſummer, to as great a degree, and upon as great a number of perſons, within a ſmall diſtrict of leſs than a mile, as it ever did in Egypt; and yet, beyond this ſpace, on either ſide, ſcarcely a perſon was affected with it. The diſorder was certainly brought into this country by the ſoldiers who returned from Egypt, and was probably communicated from them to many others. Now, as the action of the atmoſphere alone cannot account for the ſpreading of the diſeaſe, &c. Mr. Ware is led to believe, that this particular diſorder is only communicable by abſolute contact; that is, by the application of ſome part of the diſcharge, which iſſues, either from the conjunctiva of an affected eye, or from ſome other membrane ſecreting a ſimilar poiſon, to the conjunctiva of the eye of another perſon. In ſchools and nurſeries, in conſequence of children uſing the ſame baſins and towels, as others who had the complaint, the diſeaſe has been communicated to nearly twenty in one academy. Hence, Mr. Ware cenſures the indiſcriminate uſe of thoſe articles in ſchools, nurſeries, hoſpitals, ſhips, and barracks. P. 14, 15.

The principal difference, between the purulent ophthalmy of infants, and that of adults, conſiſts in the different ſtates of the tunica conjunctiva. In the former, notwithſtanding the quantity of matter confined within the lids is often profuſe, the inflammation of the conjunctiva is rarely conſiderable, and whenever the cornea becomes impaired, it is rather owing to the lodgment of ſuch matter on it, than to inflammation. But in the purulent ophthalmy of adults, the diſcharge is always accompanied with a violent inflammation, and generally with a tumefaction of the conjunctiva, by which its membranous appearance is deſtroyed, and the cornea is made to ſeem ſunk in the eye-ball. Ware, p. 23.

We have already detailed the ſucceſsful plan of taking very large quantities of blood from the arm, as practiſed by Mr. Peach. Mr. Ware ſpeaks alſo in favour of bleeding; but has rarely carried it to the extent it has been in the army. In weak perſons, this gentleman prefers, inſtead of repeating veneſection, topical bleeding, either from the vein that paſſes on the ſide of the noſe, or by means of five or ſix leeches put on the temple. Sometimes, he thinks it better to ſcarify the inſide of the lower eye-lid with the point of a lancet, carried along parallel to, and very near the margin of this part. Mr. Ware objects to pricking the eye-lid in an infinite number of places, as very painful, and likely to increaſe the irritation. The lancet never need be applied more than twice, and rarely more than once; and, perhaps, leſs pain will be occaſioned by making the inciſion with the edge, rather than the point of the lancet. After taking away blood, Mr. Ware ſays, a large bliſter on the head, or back, is often uſeful. Anodynes ſhould be given, with occaſional purgatives, and an antiphlogiſtic regimen. Ware on Purulent Ophthalmy, 1808, p. 26, &c.

Dr. Vetch, on the ſubject of local applications in the preſent diſeaſe, adviſes keeping the eyes continually covered with linen, dipt in ſome cooling lotion. In the firſt ſtage, he gives the preference to dropping the aqua ſapphirina into the eye; afterwards, when the ſwelling of the eye-lids has come on, he prefers the aqua litharg. acet. While the patient is ſubject to a recurrence of pain, he thinks the

injection of warm water the beſt application. For the purpoſe of leſſening the ſwelling of the eye-lids, he adviſes compreſſes, dipt in the aqua litharg. acet., to be applied with a moderately firm preſſure. When the ſwelling, and other ſymptoms of the ſecond ſtage have ſubſided, Dr. Vetch recommends more aſtringent applications, ſuch as the aqua lithargyri acet., Bates's camphorated water, ſolutions of alum, and the muriate of mercury. See An Account of the Ophthalmia, as it appeared in England ſince the Return of the Britiſh Army from Egypt; by John Vetch, M.D. 1807; p. 111.

Mr. Ware gives the preference to the aqua camphorata, which is to be uſed exactly in the ſame way, as was deſcribed above, in ſpeaking of the purulent ophthalmy of children. Probably, if army ſurgeons had been careful to inject their applications under the eye-lids, as adviſed by Mr. Ware, great benefit would have been produced. In other ways, the effect of the remedies is often loſt. When the inflammation has been great, Mr. Ware has only put four or five grains, inſtead of eight, of the cuprum vitriolatum to eight ounces of water; and, while the inflammation is great, he would never adviſe more than eight grains to this quantity of water. He uſually employs the lotion cold, eſpecially in children; but in ſome adults, in whom the general fever and local inflammation have been conſiderable, he has been obliged to uſe it warmed. In caſes of great pain and ſwelling, it ſhould be very weak, leſs often applied, and ſometimes only warm water injected. In ſuch circumſtances, Mr. Ware alſo ſanctions fomenting the eye with a flannel, or ſponge, wet with a hot decoction of poppy-heads, or mere hot water. When the cornea threatens to burſt, this gentleman approves of opening it, in order to diſcharge the aqueous humour, by making an inciſion in a place where the ſcar will not obſtruct viſion.

Mr. Wardrop, it is well known, has adviſed puncturing the cornea, and letting out the aqueous humour, in all caſes of ophthalmy attended with ſevere ſymptoms and conſiderable fullneſs of the eye. (See Edinb. Med. and Surg. Journal, for January 1807.) Mr. Ware approves of the ſame proceeding in the epidemic purulent or Egygtian ophthalmy, when antiphlogiſtic, mucous, and aſtringent lotions fail in leſſening the ſymptoms, and in preventing the cornea from becoming opaque; but, eſpecially, if a white rim ſhould begin to be formed at its circumference.

*Of Chronic Ophthalmy.*—Strictly ſpeaking, every acute ophthalmy has a ſecond ſtage, which is, when compared with the firſt, of a chronic nature. However, in general, when *chronic* ophthalmy is ſpoken of, the diſeaſe is implied, as it appears in a very protracted ſtate.

The ordinary cauſes of chronic ophthalmy are of three kinds. 1. An increaſed irritability continuing in the eye after the acute ſtage of ophthalmy has ſubſided. 2. Another affection of the eye, or of the adjoining parts, of which the chronic ophthalmy is only an effect. 3. Conſtitutional diſeaſe.

1. The firſt kind of caſe requires the internal exhibition of bark and valerian. The patient ſhould take nouriſhing, eaſily digeſtible food; a moderate quantity of wine and gentle exerciſe; and he ſhould reſide in a mild and ſalubrious ſituation. The vapour of the ſpiritus ammoniæ compoſitus ſhould be applied to the eye, through a funnel for half an hour, three or four times a day, and the eye-lids and eyebrows may be rubbed with the linimentum camphoræ.

2. The diſorders in the eye and its vicinity, on which chronic ophthalmy depends as an effect, are conſidered in other articles of the preſent work. See FISTULA *Lachrymalis*; STAPHYLOMA; TRICHIASIS; ECTROPIUM; &c.

We ſhall conclude this ſubject with a few obſervations on chronic ophthalmy connected with conſtitutional diſeaſes.

*Scrofulous Ophthalmy.*—According to the poſthumous work of Mr. Saunders, puſtules of the conjunctiva, aggregated at the margin of the cornea, or appearing ſeparately, or ſucceſſively over any part of its ſurface, conſtitute a ſpecific character of ſtrumous ophthalmy, with which the morbid appearances, peculiar to a ſcrofulous conſtitution, are in various degrees connected. In large cities, the cauſes are ſtated to be an impure atmoſphere, improper food, and cold.

No ſpecific for ſcrofula being known, the treatment rather conſiſts in preventing an aggravation, than attempting the radical cure of the complaint. Every thing debilitating is injurious; as evacuations, indigeſtible food, intenſe ſtudy, a ſedentary life, damp marſhy reſidences, lowneſs of ſpirits, frequent tranſitions from heat to cold. On the other hand, keeping the bowels in a regular ſtate with ſmall doſes of the tartras potaſſæ, antimonium tartarizatum, or rhubarb, and the exhibition of bark, to which may be occaſionally added the tinctura guaiaci ammoniata, are particularly proper. The æthiops mineralis may be advantageouſly given from gr. ſs to gr. xx daily for the ſpace of three weeks. Scarpa alſo recommends the aqua calcis to be taken in broth for ſeveral months, and ſea-bathing, and friction of the body with a fleſh-bruſh.

With regard to topical remedies, ſoft relaxing applications prove hurtful; but ſlightly aſtringent collyria, the tinctura thebaica, and the unguentum tutiæ, are advantageous applications. All coverings muſt be removed from the eyes, except a ſhade of green ſilk.

Scrofula often diſappears ſpontaneouſly as children approach the adult ſtate, and, with it, this affection of the eyes.

Upon the treatment of ſcrofulous ophthalmy, the publication of the late Mr. Saunders affords no very remarkable information. Mild caſes are ſaid to yield to a purer atmoſphere, and a few doſes of the hydrargri ſubmurias and rhubarb; but too frequent a repetition of the firſt of theſe medicines is condemned. When the inflammation is not acute, and the ulcers are indiſpoſed to heal, we are adviſed to inject on them a ſolution of nitrate of ſilver, two grains to an ounce of diſtilled water. But when more lymph is effuſed round the ulcer than is neceſſary for the healing proceſs, general, or topical bleeding, and more frequent purging, are ſanctioned. In this ſtate, every ſtimulant application is forbidden, and we are recommended to employ either a weak ſaturnine lotion cold, or elſe a warm decoction of poppies.

*Venereal Ophthalmy.*—In no ſubject do ſurgical writers betray leſs conſiſtency than in the preſent. Many have doubted the reality of ſyphilitic ophthalmy; others have admitted its occurrence, but left it undeſcribed. Scarpa ſays it is peculiar in not betraying manifeſt ſigns of inflammation, ſtealing on clandeſtinely without much uneaſineſs. It afterwards relaxes the veſſels of the conjunctiva and lining of the eye-lids, and alters the ſecretion of Meibomius's glands. Ulceration of the margin of the eye-lids is cauſed, the eyelaſhes fall off, and the cornea becomes opaque. In the worſt ſtage, the malady excites an itching in the eyes, that is exaſperated at night, and diminiſhes towards the morning.

It is obſerved by Mr. Pearſon, that, in that form of the ſecondary ſymptoms of ſyphilis, where the ſkin is the part chiefly affected, a diſeaſe reſembling the ophthalmia tarſi ſometimes makes its appearance. It is not commonly attended with much redneſs of the tunica conjunctiva; nor is the ſenſibility of the eye to light remarkably increaſed; yet

this gentleman has ſeen the complaint, in a few inſtances, under the form of an acute ophthalmy, reſiſting all the common modes of treatment, but yielding immediately to a courſe of mercury.

According to Mr. Pearſon, the venereal ophthalmy reſembles in its appearance ſuch diſeaſes of the tarſi and conjunctiva as are derived from ſcrofula; and, in his belief, there are no ſpecific characters by which diſeaſes of the eye or eye-lids, produced by the action of the venereal virus, can be diſtinguiſhed from thoſe which are excited by other cauſes. See Tranſ. of Scarpa on Diſeaſes of the Eyes, by Briggs, note, p. 187.

In the poſthumous work of Mr. Saunders, ſyphilitic inflammation of the iris is ſtated to differ from common inflammation of that part in the following circumſtances: the iris is much more thickened and puckered, the texture appears more changed, the irritation on expoſure to light is leſs, the pain is moſt intenſe at night, and red veſſels are ſooner ſeen in the ſubſtance of the iris. The pupil is not ſo much contracted as in a caſe of ſimple inflammation; and although the general appearance of diſeaſe is greater, the pain is actually leſs. The blindneſs is often total. When ſyphilis affects the other tunics of the eye, as well as the iris, the eye-ball is ſaid to appear full, the patient is ſlightly incommoded by preſſure on the organ, and the ſenſibility of the retina is impaired, and, in ſome inſtances, deſtroyed. In the worſt ſtage, the pupil is repreſented as becoming irregular and dilated; while the iris and cornea are in contact, and much diminiſhed and obſcured; the ſclerotica is tumid and uneven on its ſurface; and much head-ache prevails. Saunders's Treatiſe on ſome practical Points relating to Diſeaſes of the Eye, &c. p. 64 and 67.

Mercurial friction, together with the decoct. ſarſaparillæ et mezerei, are recommended. A few drops of a collyrium, containing the hydrargyrus muriatus, are alſo directed to be introduced under the eye-lids every two hours. At night the eye-lids may be ſmeared with Janin's ointment, or the unguentum hydrargyri nitrati. Mr. Saunders appears to have cured venereal ophthalmies, by exhibiting calomel very freely. In one caſe he gave eight grains a day for a fortnight; and in another, two grains were ordered to be taken every five hours, with half a grain of opium. The ſame diſtinguiſhed oculiſt alſo ſometimes took blood from the temporal arteries.

The works to which we are chiefly indebted for the preceding obſervations, are Richter's Anfangſgrunde der Wundarzneykunſt, band 3. kap. 1. Ware on Ophthalmy, Pſorophthalmy, &c. Alſo on the Epidemic Purulent Ophthalmy. S. Cooper's Dictionary of Practical Surgery, edit. 2; and Firſt Lines of the Practice of Surgery, edit. 3. Saunders's Treatiſe on ſome practical Points relating to Diſeaſes of the Eye; and Scarpa's Oſſervaz. ſulle Principali Malattie degli Occhi, capo 7.

In the foregoing article, the reader may have expected a few remarks on common contuſions of the eye; but the nature and treatment of theſe caſes are ſo familiarly known to every body in the preſent flouriſhing condition of the art of pugiliſm, that we conſider it almoſt ſuperfluous to ſay any thing here upon the ſubject. The moſt ſucceſsful plan of preventing and leſſening the diſcolouration attending what is termed a *black eye*, is to bathe the contuſed part, as ſoon after the receipt of the blow as poſſible, with the aqua ammoniæ acetatis, or common vinegar. Linen may be wet with either of theſe applications, and kept conſtantly upon the bruiſe, care being taken to dip the rag frequently in the lotion, ſo that it may always be wet and cool. Beſides this common means, it will be proper in ſevere caſes to purge the patient, and even to uſe leeches, and practiſe veneſection.

OPIATE, Opiatum, in *Medicine*, is ſometimes applied to any confection or electuary.

In which ſenſe it is defined an internal remedy, variouſly compoſed of powders, pulps, liquors, ſugar, or honey, reduced into a ſoft conſiſtence.

The opiate of Solomon was formerly a compoſition of great fame, ſo called from one Solomon, a phyſician, its inventor; and firſt publiſhed by Lawrence Joubert.

There is a particular kind of opiates, called *incarnatives*, for the teeth and gums, made of alum, ſumach, lignum aloes, myrrh, maſtic, &c. reduced into powder.

Opiate is alſo uſed for any medicine given with an intention to procure ſleep.

In which ſenſe the word is of the ſame import with *narcotic*, *hypnotic*, *ſoporific*, or *pacific*.

Opiate is more particularly uſed for a compoſition wherein opium is an ingredient. See Opium.

OPIE, John, in *Biography*, our late profeſſor of painting in the Royal Academy, was born in May, 1761, at St. Agnes, in Cornwall, a village about ſeven miles diſtant from the town of Truro. His father was a maſter carpenter, and principally engaged in ſupplying the mines in that neighbourhood with ſuch conſtructions of timber as they required, either for working or for ſupport.

Few men have attained to eminence by a more irregular courſe of ſtudy, by ſtronger native endowments, or by more determined induſtry, than Opie. He was very remarkable for the ſtrength of his underſtanding, and the rapidity with which he acquired all the learning that a village ſchool could afford him. When ten years old, he was not only able to ſolve ſeveral difficult problems in Euclid, but was thought capable of inſtructing others: and when he had ſcarcely reached his twelfth year, he eſtabliſhed an evening ſchool in St. Agnes, and taught writing and arithmetic; reckoning among his pupils ſome who were already twice his age.

His father was very ſolicitous to bring him up in his own buſineſs, and to this end bound him apprentice to himſelf. But the drudgery of a laborious employment was by no means ſuitable to one whoſe mind had attained ſome glimpſes of ſcience, and ſtill more of art. From his tenth year he had practiſed drawing, and even painting, in a rude way; and took every opportunity, which his confined ſituation afforded, of contemplating prints and pictures; though without any ſyſtem or intention of purſuing the art profeſſionally. So ardent was he in the love of it, that he is ſaid to have neglected his labour, when in houſes where any picture caught his attention, and, in ſome inſtances, carried away ſo much of the works he ſaw in his remembrance, as to have made tolerable good imitations of them at home.

At laſt his father, who ſtrenuouſly endeavoured to controul his inclinations, gave way to his determined perſeverance.

He had already exhibited the ſuperior endowments of his mind, and hung his father's houſe with portraits of his family and friends, when by accident he became acquainted with Dr. Wolcot, then reſiding at Truro, and ſince ſo celebrated under the title of Peter Pindar; who having himſelf a taſte for drawing, and a ſtrong perception of character, ſaw the worth of our artiſt, and was well fitted to afford him inſtruction in many requiſite points.

The patron was proud of his pupil, and aſſiſted and recommended him ſo effectually, that he commenced profeſſed portrait painter, and went about to the neighbouring towns with letters of introduction to the principal families reſident in them, and henceforward entirely ſupported himſelf by his own exertions.

At

At length, in 1781, he came to London, ſtill under the auſpices of Dr. Wolcot, whoſe powerful pen was not ſilent in his cauſe; and the Corniſh boy, juſt ſprung from a tin-mine, and practiſing the difficult art of painting in a forcible manner, and in an original and untutored ſtyle, was the theme of wide-ſpread reputation. By the intervention of Mrs. Boſcawen, to whom the doctor mentioned the talents of Opie, his works became the theme of faſhionable converſation, and he was ſoon almoſt overwhelmed with ſolicitations for portraits by perſons of the higheſt diſtinction; who, caught by the novelty, and ſtruck with the force of his repreſentations, preſſed upon each other to be firſt in his ſtudy, and inſure the exertions of his talents in their favour.

But in little leſs than a twelvemonth, the novelty ceaſing, and thoſe talents being more ſolid than ſhowy, fitted more to gratify the ſenſible than pleaſe the vain, this burſt of occupation ceaſed. It was found that the engaging graces and the enchanting ſmiles of the ladies were not taſtefully diſplayed; or due dignity and conſequence given to the gentleman: and a regard to truth, ſimple and unadorned, not being the guide to judgment with the many, Opie was left for a while, almoſt as if he had never been known, to ſcramble his way onward, as chance or the happy exerciſe of his powers might aſſiſt and direct him.

But he was not a man to be overcome by ſuch a change of circumſtances, and perhaps it was fortunate for his reputation that it was experienced by him. Being gifted by nature with the moſt reſolute induſtry and perſeverance, he was determined not the leſs to merit a continuance of the ſucceſs he had enjoyed; and employed the time now left upon his hands in attempts at compoſition of ruſtic ſubjects, and in more regular hiſtorical painting.

By the eſtabliſhment of the Shakſpeare Gallery in 1786, Opie was firſt fully made known to the public; the latent powers of his mind were there called forth, and what he wanted of academical and claſſical information, he compenſated for, in great meaſure, by character, by force, and by a bold imitation of nature in individual parts. For this gallery he painted five large pictures, of which the fineſt was from the Winter's Tale; Leontes adminiſtering the oath to Antigonus to take charge of the child. But he produced, about the ſame time, a work of far more excellent quality in effect and colour, *viz.* the aſſaſſination of James I. of Scotland, now in the Common Council room at Guildhall; a work which, for hue and colour, challenges competition with the beſt, and is wrought with the greateſt boldneſs and force.

The ſpirit of commerce having been ſucceſsfully exerted, by employing hiſtoric art in the illuſtration of our great dramatic author, other ſpeculations upon the ſame principle were ſoon entered upon: Macklin adopted the bible as the baſis on which to form a gallery of pictures; and Bowyer, the Engliſh hiſtorian Hume; and both were happy to avail themſelves of the talents ſo powerfully exhibited by Opie, who painted many pictures for each of theſe inſtitutions with varied ſucceſs.

Of Opie's ſtyle, the more engaging characteriſtics are breadth, ſimplicity, and force; its defects are want of grace and variety of invention; and of elegance and refinement in expreſſion and execution. The objects of his choice were among the ſtriking and terrible, rather than the agreeable and beautiful; and the materials he introduced were more accordant to his ideas of the pictureſque than the proper. He frequently violated coſtume, not for want of knowledge ſo much as from an inſatiable deſire of contraſt; and ſometimes from conveniency. His taſte lay in the repreſentation of natural objects with ſtrong effect, he therefore made uſe of armour, or of draperies which he had in his ſtudy, and, like Rembrandt, adopted them as his antiques, and uſed them according as he felt they would beſt promote his immediate end. Theſe defects are redeemed, to the well informed eye, by the abſolute truth of imitation in which they are wrought, by the expreſſion of his heads, particularly of old men, or of ſtrongly marked characters, which are exceedingly impreſſive, by the energetic actions of his principal figures, by the broad and daring execution of his pencil, and by the magic force of his chiaro-ſcuro. In the latter point no artiſt ever excelled him. His figures project from the canvas in ſome of his beſt works; and if ſeen under favourable circumſtances, would be abſolutely illuſive.

When the tide of hiſtoric commiſſions ſubſided, Opie employed himſelf in repreſenting ſcenes of common life, as well as in portraits. Cottage viſits, an old ſoldier at an ale-houſe door, fortune-tellers, and that claſs of materials which the Dutch and Flemiſh maſters have recommended by high finiſh and convenient neatneſs of ſize, he painted upon a large ſcale. The reputation ſo juſtly due to his talents had now become ſteadily attached to him, and he had no longer to complain of the unfeeling caprice of faſhion, for he enjoyed an uninterrupted ſource of employment, in portraiture at leaſt, till his death, and generally diſpoſed of the fancy pictures with which he choſe to interſperſe his labours. Theſe were very numerous, for he was exceedingly induſtrious, and his principal delight was in the practice of his profeſſion.

His portraits are well worthy of eſteem, from the complete individuality which characteriſes them, without being marked with trifling peculiarities. They are calculated to gratify the ſenſible and judicious, who prefer a direct appeal to the underſtanding, over a more alluring inſinuation by the medium of taſte; which, while it pleaſes the eye, too frequently ſacrifices ſomewhat of truth. Yet they are often gracefully as well as powerfully marked. Thoſe who recollect the portrait of H. Treſham, R. A. (exhibited in 1806, and now in the poſſeſſion of lord Cawdor,) will acknowledge the truth of this remark, while in that of Mr. Holcroft, (exhibited at the ſame time,) they beheld the great extent of his power in preciſe and poſitive, but determined and bold, imitation of feature and character.

Opie having been admitted an aſſociate of the Royal Academy in 1786, and an academician in the year following, upon the diſmiſſal of Mr. Barry from the body, aſpired to the honour of being profeſſor of painting, but reſigned his pretenſions in favour of Mr. Fuſeli, who was choſen. When that gentleman was appointed to the ſtation of keeper in 1805, he again advanced his claim, and was unanimouſly received. He had previouſly tried his power in literary compoſition, with no ſlight degree of ſucceſs; firſt in the life of ſir J. Reynolds, in Dr. Wolcot's edition of Pilkington's dictionary, and again in the publication of a plan for the formation of a national gallery, "tending at once to exalt the arts of his country and immortalize its glories." He afterwards, in 1804, read two lectures on painting at the Royal Inſtitution, which were fraught with inſtructions, and were received with applauſe; though it has been obſerved by a judicious critic, that the ſtyle in which they were compoſed was "abrupt, crowded, and frequently unmethodical; rather ruſhing forward himſelf, than leading his auditors to the ſubject." Nevertheleſs, his exertions on this occaſion drew upon him reſpect, the more perhaps as he was not generally known to be a man fond of literature; and the world were the more ſurpriſed to hear refined ſentiments in eaſy and even elegant language, from one who was not unfrequently

repreſented

represented as coarse and vulgar in mind and manner. In fact, Opie by no means merited such an unfavourable report; he was plain and unaffected, and spoke his mind freely; was manly and energetic, yielding little to folly or caprice, and by no means adapted to gratify the vain and ignorant; but he was not wilfully offensive, and condemned warmly those who were so.

He possessed a tenacious memory, and readily quoted in conversation the authors he had read, particularly the poets, and was a playful and entertaining companion when he found his company agreeable to him, capable of enjoying his humour, of benefiting by his information, or of eliciting reflection in his own mind; and it was seldom that a thinking man could be in his society without feeling roused by his energy.

The lectures which he delivered at the Royal Academy are published to the world, it is therefore not necessary to enter upon their merits; but it will be justice to their author, earnestly to recommend the perusal of them to all who wish to understand the principles of the art on which they treat. Unhappily the course was incomplete, as he only gave four lectures of the six prescribed to each professor. The world were deprived of all further benefit from his powerful intellects by his death, which occurred, after a lingering illness, in April 1807. He was honoured by an interment in St. Paul's cathedral, near the grave of sir Joshua Reynolds, and his funeral was most respectably attended by almost all the members of the Royal Academy, and many of the nobility and gentry of the country.

OPILIO, in *Natural History*, a species of *Phalangium*; which see.

OPIMATORES, among the Romans, military men, who had the direction and management of the provisions, and were to take care that the army wanted nothing.

OPINION, Opinio, denotes a probable belief; or a doubtful and uncertain judgment of the mind.

Opinion is better defined the assent of the mind to propositions not evidently true at first sight; nor deduced, by necessary consequence, from others that are so; but such as carry the face of truth.

The schools define opinion, *assensus intellectus cum formidine de opposito*; an assent of the understanding, with some fear or distrust of the contrary being true.

According to logicians, demonstration begets science, or knowledge; and probable arguments beget opinion.

Wherever the mind's acquiescence in a truth proposed to it is accompanied with any doubt, this is what we call an opinion, and it is the result of obscure and indeterminate perception. That the planets revolve about the sun is a branch of knowledge: that they are inhabited by beings similar to men is only an opinion. Hence, knowledge is said to be certain, opinion uncertain. Of opinions, some are probable and others improbable. A probable opinion is one, the evidence of the truth of which preponderates over that of its falsehood: and an improbable opinion is that, the evidence of whose falsehood preponderates over that of its truth.

Plato makes opinion a medium between knowledge and ignorance; clearer and more express than ignorance, yet more obscure and unsatisfying than knowledge.

OPISTHODOMUS, οπισθοδομος, among the *Athenians*, the public treasury, so called from its being situated on the backside of Minerva's temple. Here, besides other public money, a thousand talents were laid in store, against any very urgent occasion; but if any man expended them upon a trivial account, he was to be put to death. Also the names of all that were indebted to the commonwealth were entered in a register in this place. The tutelar gods of this treasury, were Jupiter Σωτηρ, or the Saviour, and Plutus, the god of riches, whom they represented with wings, and placed next to the statue of Jupiter the Saviour; which was unusual in other places.

OPISTHOGRAPHUM, οπισθογραφον, among the *Ancients*, a waste-book, or schedule, on which were writ extemporary things that wanted to be revised and corrected afterwards.

The word is compounded of οπισθεν, *i. e. afterwards*, or *on the backside*, and γραφω, *I write*; because it was writ over again on the backside of every page, which was left blank for that purpose.

OPISTHOTONOS, from οπισθεν, *backward*, and τονος, from τεινω, *to extend*, in *Surgery*, that species of tetanus, in which the head and trunk are drawn backward by the muscles. See Tetanus.

OPIUM, in *Chemistry* and *Medicine*. Several vegetables furnish a milky fluid, which, when reduced to a proper consistency, may have similar properties to opium properly so called. Of these are the lactuca virosa, or the wild lettuce, as well as the garden lettuce. But it is furnished in the greatest abundance from the white poppy of the East, (papaver somniferum,) and also, in small quantity, from the other species of the poppy.

The white poppy is cultivated to great extent in Turkey, for the purpose of affording opium. After the flowering of the plant, when the capsule containing the seed has arrived at its full growth, slight longitudinal incisions are made in the capsules towards the evening. A milky juice oozes out, which is collected the next day. The excess of moisture being evaporated in the sun, it assumes the consistency fitted for making it into cakes, in which state it is found in commerce. This is generally called *Turkey* opium, to distinguish it from another kind brought from the East Indies, and known by the name of *East Indian* opium. This is generally softer than the Turkey, of a darker colour, less bitter, and more disagreeable to the taste, and has a disagreeable empyreumatic smell. It is not so strong as the Turkey, but considerably cheaper. When opium is soft and friable, of a blackish colour, and has an empyreumatic smell, it is bad. Its taste should be bitter but not sweet.

Opium softens with heat so as to adhere to the fingers, but it does not fuse. When it is reduced to powder, and ground into a pulp with alcohol or water, and an extra quantity of fluid added, the greatest part of it will dissolve by boiling it for some time, a great part of which is deposited on cooling. We have already given the means of separating a peculiar substance from opium, under the article Narcotic *Principle*; which see.

Both alcohol and water, therefore, appear to dissolve the principal part of opium, but the alcoholic solution is generally used in medicine.

The aqueous solution is rather less coloured than that with spirit. It has also less smell and taste. It affords a precipitate with carbonate of potash, with the muriates and nitrates of mercury, with acetate of lead, nitrate of silver, and a brown precipitate with the red sulphate of iron. Infusion of galls affords a precipitate with opium. In triturating opium to mix it with water, a glutinous or rather waxy substance adheres to the bottom of the mortar, which does not mix with the liquid. This is the insoluble part of opium.

From what is stated here and under the article Narcotic *Principle*, it will appear that opium principally consists of three substances, namely, the *narcotic principle*, to which it owes its property of lessening the sensibility of the system; of a resin, to which it owes its stimulating virtues, and its great inflammability; and the oxygenated extract, to which may be

be attributed its aſtringent qualities. It is no doubt on this account that medical men have differed ſo much as to its being a ſedative or a ſtimulant. Moſt of them agree that the ſedative effects which reſult from it, are greater than could reſult from the ſtimulus previouſly afforded. It is hoped that ſome ingenious experimenter will clear theſe anomalies by new reſearches. See NARCOTIC *Principle*.

OPIUM, formed from οπος, *juice*, in *Pharmacy*, &c. a narcotic, gummy-reſinous milky juice, drawn from the heads or capſules of the white poppy, more eſpecially abounding in the cortical part of the capſules, and afterwards inſpiſſated. The capſules are powerfully narcotic, and anodyne; boiled in water they impart to the water their narcotic juice, together with other juices which they have in common with vegetable matters in general. The liquor, ſtrongly preſſed out, ſuffered to ſettle, clarified with whites of eggs, and evaporated to a due conſiſtence, yields an extract which is about one-fifth or one-ſixth of the weight of the heads. This poſſeſſes the virtues of opium, but muſt be given in double its doſe to anſwer the ſame intention, which it is ſaid to perform without occaſioning a nauſea and giddineſs, the uſual effects of opium. This extract was firſt recommended by Mr. Arnot (Med. Eſſ. and Obſ. Edinb. vol. v. p. 108.); and a ſimilar one is now received in the Edinburgh pharmacopeia. It is found very convenient to prepare the ſyrup from this extract, by diſſolving one dram in two and a half pounds of ſimple ſyrup. The "ſyrupus papaveris albi," as directed by both colleges, is a uſeful anodyne, and often ſucceeds in procuring ſleep, where opium fails: it is more eſpecially adapted to children. White poppy heads are alſo uſed externally in fomentations, either alone, or more frequently added to the "decoctum pro fomento."

When the juice flows of itſelf, through inciſions made in the poppy heads, it is properly called *opium*. When drawn by expreſſion, it ought rather to be called *meconium*. The difference between the qualities and virtues of the two juices is very conſiderable. The former is preferable on all accounts, but it is exceedingly rare; the Turks, among whom it is produced, and who make great uſe of it, never allow it to be exported. So that it is the latter that is ordinarily uſed among us, and ſold for opium.

Kæmpfer relates, that the heads, when almoſt ripe, are wounded with a five-edged inſtrument, by which as many parallel inciſions are made at once from top to bottom; that the juice which exudes is next day ſcraped off, and the other ſide of the head wounded in like manner; and that the juice is afterwards worked with a little water, till it acquires the conſiſtence, tenacity, and brightneſs of the fineſt pitch.

The moſt circumſtantial detail of the culture of the poppy, and of the method of procuring the opium from it, is that given by Mr. Kerr, as practiſed in the province of Bahar: he ſays, "the field being well prepared by the plough and harrow, and reduced to an exact level ſuperficies, is then divided into quadrangular areas of ſeven feet long, and five feet in breadth, leaving two feet of interval, which is raiſed five or ſix inches, and excavated into an aqueduct for conveying water to every area, for which purpoſe they have a well in every cultivated field. The ſeeds are ſown in October or November. The plants are allowed to grow ſix or eight inches diſtant from each other, and are plentifully ſupplied with water. When the young plants are ſix or eight inches high, they are watered more ſparingly, but the cultivator ſtrews all over the areas a nutrient compoſt, of aſhes, human excrements, cow-dung, and a large portion of nitrous earth, ſcraped from the highways and old mud-walls. When the plants are nigh flowering, they are watered profuſely to increaſe the juice. When the capſules are half grown, no more water is given, and they begin to collect the opium. At ſun-ſet they make two longitudinal double inciſions upon each half-ripe capſule, paſſing from below upwards, and taking care not to penetrate the internal cavity of the capſule. The inciſions are repeated every evening, until each capſule has received ſix or eight wounds; they are then allowed to ripen their ſeeds. The ripe capſules afford little or no juice. If the wound was made in the heat of the day, a cicatrix would be too ſoon formed. The night-dews, by their moiſture, favour the exſtillation of the juice.

"Early in the morning, old women, boys, and girls, collect the juice by ſcraping it off the wounds with a ſmall iron ſcoop, and depoſit the whole in an earthen pot, where it is worked by the hand in the open ſunſhine, until it becomes of a conſiderable ſpiſſitude. It is then formed into cakes of a globular ſhape, and about four pounds in weight, and laid into little earthen baſins, to be further exſiccated. Theſe cakes are covered over with the poppy or tobacco-leaves, and dried until they are fit for ſale. Opium is frequently adulterated with cow-dung, the extract of the poppy plant procured by boiling, and various other ſubſtances, which they keep in ſecreſy. Opium is here a conſiderable branch of commerce. There are about 600,000 pounds of it annually exported from the Ganges." Med. Obſ. and Inq. vol. v. p 317.

Opium is imported into Europe from Perſia, Arabia, and other warm regions of Aſia. It is brought into this country in cheſts from Turkey and India. The *Turkey opium* is in flat pieces, covered with leaves, and the reddiſh capſules of ſome ſpecies of rumex, which is conſidered as an indication of its goodneſs, as the inferior kinds of opium have none of theſe capſules adhering to them. This opium generally contains about $\frac{1}{4}$th part of impurities. *Eaſt Indian opium* is in round maſſes, covered with ſucceſſive layers of leaves, to the thickneſs nearly of $\frac{1}{4}$th of an inch.

Dr. Charles Alſton, profeſſor of botany and the materia medica in the univerſity of Edinburgh, has given us a diſſertation on opium in the medical eſſays of that place, vol. v. art. 12. This gentleman is of opinion, that notwithſtanding the authorities of Lemery, Savary, Monſieur de la Condamine, in the Mem. de l'Acad. des Sciences for 1732, all which would lead us to conclude we have nothing but the meconium, or the expreſſed juice or decoction of the plant, our opium is neither an extract, nor an inſpiſſated expreſſed juice of poppies, but the milky juice drawn by inciſion from poppy heads. To ſhew this, the doctor, according to the directions of Dioſcorides, on a dry day, before noon, cut off the crown of white poppy heads, ſo as to avoid penetrating into the cavity of the fruit, and collected the milk with a ſilver ſpoon in a china cup. The juice being expoſed to the open air, in a few days thickened to the conſiſtence of opium, and was of a fiery, hot, bitter taſte, and ſoporiferous ſmell, and more ſo than the common opium, of a dark yellowiſh-brown colour on the outſide, ſomewhat higher within, and appeared as if compoſed of drops; after ten years keeping, its colour and taſte remained. This agreed with the account Bellonius, lib. iii. obſ. 15. gives of the beſt opium. That which was gathered from the papaver vulgare, or wild poppy, was ſomewhat of a lighter colour; but Dr. Alſton thinks this but accidental, as the milk ſoon turns black on the knife. He alſo ſlightly ſcarified ſome poppy heads, after the Perſian manner. When the juice was thickened, he ſcraped off the opium, and obtained more of it than by the other method. To procure the tear in its utmoſt perfection, he cut off the ſtar from ſeveral heads, and bending them down let the milk drop

drop into a cup. It grew ſolid as opium, and being formed into a lump, appeared uniformly white; nor was there any difference in the juice of different poppies.

Secondly, the doctor obſerves, that the extract and inſpiſſated juice ſcarce any where reſemble opium; nor is their taſte and ſmell like it. The extract appears black when dried, and ſo does the juice, but when diluted, the firſt is brown and the latter green. The extract is tough and adheſive, the juice rough and friable, and grows mouldy a day or two after expreſſion. Opium may poſſibly be mixed with either of theſe; and the greeniſh-brown opium may have ſome ſmall portion of the juice in it. Its penetrating ſmell is certainly owing to the mixture of ſome aromatic ſubſtance.

Thirdly, opium contains more reſin than either the inſpiſſated juice or extract. One-third of opium appears to be reſin, while the juice and extract ſcarcely yield one-tenth part.

Fourthly, if opium was not the tear of the poppy, there would be no occaſion for ſowing ſo many fields with poppies in Egypt, and other places. Nor would it be ſo powerful a medicine, for its anodyne virtues depend chiefly on the milky juice.

It is a popular error that there is any ſuch thing as white opium; for though the juice, as it runs from the heads of the poppies, be of a milk-colour, it always becomes of a very deep brown as it thickens. Wherever it is found yellowiſh or ſoft, it is a ſign that the juice has not had fire enough.

Moſt of the opium ſold at Conſtantinople is brought from Anatolia, from a place called, by the Turks, Aphium Carahiſſat, *i. e.* Black Caule of Opium. It is alſo produced in the territory of Thebes, in Egypt, whence the beſt opium was formerly called *Thebaic* opium: this differs from the *meconium*, which was made by the ancients of the expreſſed juice or decoction of the poppy, and which they juſtly deemed the "meconium multum opio ignavius."

Opium, according to the experiments of Dr. Alſton, conſiſts of five parts in twelve of gum, four of reſin, and three of earth, or other impurities, not diſſolvable either in watery or ſpirituous menſtruums. From theſe laſt it is purified, in the ſhops, by ſoftening the opium with boiling water, in the proportion of a pint to a pound, into the conſiſtence of a pulp, with care to preveut its burning; and whilſt it remains quite hot, ſtrongly preſſing it from the fæces through a linen cloth; the ſtrained opium is then inſpiſſated in a water-bath, or other gentle heat, to its original conſiſtence. When thus ſoftened with a ſmall quantity of water, the gummy and reſinous parts paſs the ſtrainer together; whereas, if diſſolved by a larger quantity, they would ſeparate from one another. Suppoſing that the reſin of opium is as good, or as much wanted as the gum, or the mucilaginous part, brandy will be found the beſt menſtruum.

The moſt active principles of opium are very fixed; for it keeps well, and, when forty years old, remains hard, ſolid, and retains its taſte: and it ſeems that the practice of roaſting opium, in order to correct it, by diveſting it of its narcotic part, is of no ſervice; and many other proceſſes have been propoſed for correcting the ill qualities which opium is ſuppoſed to poſſeſs, beſides roaſting it; ſuch as fermentation, long-continued digeſtions or boiling, and repeated diſſolutions and diſtillations. Theſe proceſſes, ſays Dr. Lewis, do not promiſe any ſingular advantage: and he adds, that diminiſhing the doſe of opium is a more certain way of leſſening its effects. Alkaline ſalts, he ſays, diminiſh the ſoporific virtue of the opium; fixed alkalies render it diuretic, while volatile ones determine its action to the cutaneous pores; and acids almoſt entirely deſtroy its force.

Upon a chemical analyſis, opium yields phlegm, urinous ſpirit, oil, a volatile and a fixed ſalt, and ſome earth; but little of the virtues of opium can be inveſtigated, or explained, from its analyſis, ſince ſimples, extremely different as to their effects on human bodies, afford the ſame principles on diſtillation, as Homberg has ſhewn by the analyſis of the deadly nightſhade, and cabbage. See Mem. de l'Acad. des Sciences, an. 1701.

The curious may find the analyſis of opium in the above mentioned diſſertation by Dr. Alſton.

Opium is regarded as bad when it is very ſoft or friable, of an intenſely black colour, or when mixed with many impurities. A weak or empyreumatic odour, ſweetiſh taſte, or the power of marking, when drawn acroſs paper, a brown continuous ſtreak, are alſo indications of inferior opium.

*Turkey opium* has a peculiar, ſtrong, heavy, narcotic odour, and a bitter taſte, accompanied with a ſenſation of acrid heat, a biting on the tongue and lips, if it be well chewed. Its colour, when good, is dark reddiſh-brown, and its texture compact and uniform. When ſoft, it is tenacious; but when long expoſed to the air, it becomes hard, breaks with an uniform, ſhining fracture, is pulverulent, and affords a yellowiſh powder. It is inflammable, and partially ſoluble in water, alcohol, and ether. By long boiling in water under expoſure to the air, its narcotic powers are impaired; yet nothing riſes with water, when it is diſtilled with that fluid: though Beaumé aſſerts, that the odorous part of the opium is an oil. When carefully triturated with hot water, about five parts in twelve of the opium are diſſolved and retained in ſolution, nearly ſix parts are ſimply ſuſpended, and rather more than one part remains perfectly inſoluble, of a viſcid, plaſtic nature, ſomewhat reſembling the gluten of wheat, but of a dark colour. This was regarded by Bucholz as caoutchouc; according to Prouſt, it contains wax; and Gren ſuppoſed it to be analogous to gluten. Mr. Thomſon (London Diſpenſatory) ſays, that by diſſolving alcohol on this ſubſtance, he found a ſmall portion of it diſſolved, acquiring a reddiſh-yellow colour, and becoming milky when added to water. Sulphuric ether, digeſted upon it, broke it down, and diſſolved a portion of it, forming a yellowiſh tincture, which when evaporated in water left reſin, a bitter extractive, and ſome acicular cryſtals of that ſalt, which Deroſné ſuppoſed to be the narcotic principle. The inſoluble part, after the action of the ether, was ſubjected to a ſet of comparative experiments with the gluten of wheat, when it afforded ſimilar reſults with the majority of the teſts employed. Hence, this part of Turkey opium appears to be a modification of gluten combined with reſin, extractive, and a peculiar ſalt.

*Eaſt Indian opium* has a ſtrong empyreumatic ſmell, and leſs of the peculiar narcotic heavy odour of the Turkey opium; the taſte is equally bitter, but more naſeous, and it has leſs acrimony: it agrees with the Turkey opium in its other ſenſible qualities, except that its colour is blacker, and its texture leſs compact; and when triturated with water no inſoluble plaſtic reſiduum is left, but it is altogether taken up; eight parts in twelve being diſſolved, and the remainder ſuſpended in the fluid.

The aqueous ſolutions of both kinds of opium are tranſparent when filtered, that of the Eaſt Indian ſort having the deepeſt brown colour; neither is decompoſed by alcohol, but both are precipitated by the carbonate of potaſh, although the pure alkali does not affect them; they are alſo precipitated by ſolutions of the muriate and nitrate of mer-

cury, the acetate and ſuperacetate of lead, the nitrate of ſilver, and the ſulphates of copper, of zinc, and of iron. They are alſo precipitated by infuſion of galls; the precipitate, as Dr. Duncan juſtly obſerves (Edinb. New Diſpenſ. 6th ed. 382.), reſembling more that produced by cinchonin, than that by gelatine. The ſolution of acetate of barytes, does not alter the ſolutions of Turkey opium, but produces a copious precipitate with thoſe of the Eaſt Indian; oxalic acid precipitates both, but the latter more copiouſly. From theſe experiments, ſays Mr. Thomſon, opium appears to contain reſin, gum, bitter extractive, a peculiar cryſtallizable ſalt, and ſulphate of lime, which appears to be very abundant in the Eaſt Indian opium: the Turkiſh contains alſo a ſpecies of gluten.

It has been diſputed, whether the activity of opium reſides in its gummy or reſinous parts. From the experiments of Hoffmann and Neumann, it ſeems to be neither in the gum, nor in the reſin; but in a certain ſubtile part of the reſinous matter, ſomewhat analogous to eſſential oils, but of a much leſs volatile kind: and they relate, that on boiling the opium in water, there ariſes to the ſurface a frothy, viſcid, unctuous, ſtrong-ſcented ſubſtance, to the quantity of two or three drams from ſixteen ounces; that this ſubſtance, in the doſe of a few grains, has killed dogs that could bear above a dram of crude opium; that in diſtillation with water, though it does not riſe itſelf, it gives over, at leaſt in part, the active principle of which it is the matrix; impregnating the diſtilled liquor with its ſcent and its ſoporific power; as eſſential oils exhale their odoriferous principle in the air, without being diſſipated themſelves. But what this ſubtile and active principle really is, in eſſential oils, odorous vegetables, or opium, is equally unknown. Neumann ſays, that he knows a preparation of opium, by which a whole chamber full of men may be preſently ſtupefied, deprived of their ſenſes, and even of their lives, without ſwallowing a ſingle grain: and he thinks, that it operates much in the ſame manner as the vapours of burning charcoal, or as the exhalations of fermenting liquors.

When ether is uſed as a menſtruum for opium, and the reſin and extractive which it takes up are ſeparated by evaporating the tincture on the ſurface of water, the pellicle of reſin depoſited is nearly inſipid, while the extractive diſſolved in the water has an intenſely bitter taſte: from this fact, and the circumſtance already mentioned, of opium becoming inert when boiled in water, we might venture, ſays Mr. Thomſon, to conclude, that the narcotic principle reſides in the extractive; but Deroſné has lately aſſerted, that the activity of opium depends on a peculiar ſalt. He evaporated a watery infuſion of opium to the conſiſtence of ſyrup, and digeſted the gritty precipitate formed by this evaporation in hot alcohol; as the ſolution cooled, a ſalt was formed, which by repeated ſolutions and cryſtallizations was obtained free from the reſin, of a white colour, and in rectangular priſms with rhomboidal baſes; theſe were inodorous, inſipid, inſoluble in cold water, but ſoluble in 400 parts of boiling water; ſoluble in 100 parts of cold, and 24 of boiling alcohol; ſoluble in hot ether and the volatile oils, but ſeparating as thoſe fluids cooled; and very ſoluble in all the acids. Given to dogs, it produced the effects of a ſtrong doſe of opium; and in a ſimilar manner the bad effects were relieved by vinegar. Mr. Thomſon, in repeating the experiments of Deroſné, obtained a much greater proportion of cryſtals of this peculiar ſalt from Eaſt Indian opium than from that of Turkey, which, in his opinion, militates againſt Deroſné's idea of its being the narcotic principle, as much larger doſes of that variety of opium are required to produce its narcotic effect on the ſyſtem. Mr. Thomſon has had an opportunity of aſcertaining the power of the ſalt; but from Deroſné's account, it is not much more powerful as a narcotic than opium itſelf. This latter writer concludes, from the effects of nitric acid and caloric on this ſalt, that it is compoſed of oxygen, hydrogen, azote, and carbon. It does not redden vegetable blues. Annales de Chimie, lxv. 270. 279.

The uſe of this celebrated medicine, though not known to Hippocrates, can be clearly traced back to Diagoras, who was nearly his contemporary; but its extenſive practical utility has not been long well underſtood, and it may perhaps be dated in this country from the time of Sydenham. Opium is the chief narcotic now employed; it acts directly upon the nervous power, diminiſhing the ſenſibility, irritability, and mobility of the ſyſtem; and according to Dr. Cullen, in a certain manner ſuſpending the motion of the nervous fluid, to and from the brain, and thereby inducing ſleep, one of its principal effects. From this ſedative power of opium, by which it allays pain, inordinate action, and reſtleſſneſs, it naturally follows, that it may be employed with advantage in a great variety of diſeaſes. Indeed, there is ſcarcely any diſorder in which, under ſome circumſtances, its uſe is not found proper; and though in many caſes it fails of producing ſleep, yet if taken in a full doſe, it occaſions a pleaſant tranquillity of mind, and a drowſineſs which approaches to ſleep, and which always refreſhes the patient. Beſides the ſedative power of opium, it is known to act more or leſs as a ſtimulant, exciting the motion of the blood: but this increaſed action has been ingeniouſly, and, as Dr. Woodville thinks, rationally aſcribed to that general law of the animal economy, by which any noxious influence is reſiſted by a conſequent re-action of the ſyſtem. By a certain conjoined effort of this ſedative and ſtimulant power, opium has been thought to produce intoxication, a quality for which it is much uſed in Eaſtern countries.

Dr. Lewis has given us the following view of the general effects of opium. It renders the ſolids, while the operation of the opium continues, leſs ſenſible of every kind of irritation, whether proceeding from an internal cauſe, or from acrimonious medicines, as cantharides, and the more active mercurials, of which it is the beſt corrector. It relaxes the nerves; abating or removing cramps or ſpaſms, even thoſe of the moſt violent kind; and increaſing paralytic diſorders and debilities of the nervous ſyſtem. It incraſſates thin ſerous humours in the fauces and adjacent parts; by which means, it proves frequently a ſpeedy cure for ſimple catarrhs and tickling coughs; but in phthiſical and peripneumonic caſes, dangerouſly obſtructs expectoration, unleſs this effect be provided againſt by ſuitable additions, as ammoniacum and ſquills. It produces a fullneſs and diſtenſion of the whole habit; and thus exaſperates inflammations both internal and external, and all plethoric ſymptoms. It promotes perſpiration and ſweat; but reſtrains all other evacuations, unleſs when they proceed from relaxation and inſenſibility of the parts, as the colliquative diarrhœa in the advanced ſtate of hectic fevers. It promotes labour-pains, and delivery more effectually than the medicines of the ſtimulating kind uſually recommended for that purpoſe; partly perhaps by increaſing plenitude, and partly by relaxing the ſolids, or taking off ſpaſmodic ſtrictures. And indeed all the preceding effects are perhaps conſequences of one general power, being nearly allied to thoſe, which natural ſleep produces.

The operation of opium is generally accompanied with a ſlow but ſtrong and full pulſe, and a ſlight redneſs, heat, and itching of the ſkin: it is followed by a weak and lan-



guid

guid pulfe, lowneſs of the ſpirits, ſome difficulty of breathing, or a ſenſe of tightneſs about the breaſt, a ſlight giddineſs of the head, dryneſs of the mouth and fauces, and ſome degree of naufea. Given on a full ſtomach, it commonly occaſions a naufea from the beginning, which continues till the opium is rejected along with the contents of the ſtomach. Where the evacuation of acrid humours, accumulated in the firſt paſſages, is ſuppreſſed by it, great ſickneſs and uneaſineſs are generally complained of, till the ſalutary diſcharge either takes place again ſpontaneouſly, or is promoted by art.

An over-doſe occaſions either immoderate mirth or ſtupidity, a redneſs of the face, ſwelling of the lips, relaxation of the joints, vertigo, deep ſleep, with turbulent dreams and ſtartings, convulſions, and cold ſweats. Geoffroy obſerves, that thoſe who recover are generally relieved by a diarrhœa, or by a profuſe ſweat, which is accompanied with a violent itching. The proper remedies, beſides emetics, bliſters, and bleeding, are acids and neutral mixtures. Dr. Mead ſays, he has given, with extraordinary ſucceſs, repeated doſes of a mixture of ſalt of wormwood and lemon juice. The firſt thing to be done for counteracting the injurious effects of too large a doſe, is the exhibition of a powerful emetic: and for this purpoſe, ℈ i of ſulphate of zinc, or from grs. v to grs. x of ſulphate of copper, diſſolved in water, ſhould be immediately ſwallowed; and the vomiting kept up for a conſiderable time, and urged by irritation of the fauces. Large draughts of vinegar and water, or other acidulated fluids, ſhould be taken; and the powers of the habit ſupported by brandy, coffee, and cordials. The ſufferer ſhould be kept awake, and, if poſſible, in continued gentle motion. Currie recommends for removing the drowſineſs, the affuſion of warm water at 106° or 108°.

A long continued uſe of opium is productive of great relaxation and debility, ſluggiſhneſs, heavineſs, loſs of appetite, dropſies, tremors, acrimony of the humours, frequent ſtimulus to urine, and propenſity to venery. On leaving it off, after habitual uſe, an extreme lowneſs of the ſpirits, languor, and anxiety ſucceed; which are relieved by having again recourſe to opium, and, in ſome meaſure, by ſpirituous or vinous liquors. Lewis's Mat. Med.

The virtues of opium, internally taken, depend chiefly on its action on the ſtomach. There are many inſtances of terrible ſymptoms, and death itſelf, cauſed by narcotics, before they went out of the ſtomach, and without inflaming it, or cauſing any viſible change in it, far leſs vitiating the maſs of blood; and alſo the ſame ſymptoms being removed, and death prevented by vomiting. Dr. Alſton is alſo of opinion, 1. That the anodyne and hypnotic virtues of opium do not depend on its action on the brain or on the blood. 2. That it affects firſt and principally the nerves to which it is applied; next ſuch as more immediately communicate with them; then thoſe which ſerve for ſenſation and voluntary motion; and, laſt of all, by conſent, the whole nervous ſyſtem. 3. That this impreſſion on the nerves differently affects the ſenſorium commune and the mind, according to its degree, and the nature and function of the nerves primarily acted upon. 4. That the primary, or firſt obſervable effect of the mechanical impreſſion of the narcotic part of opium on the nerves, is the relaxation of the fibres. Now as this relaxation of the nerves, and conſequently of the moving fibres, demonſtrates opium to be more than a palliative remedy in a great many diſeaſes; ſo it is not difficult by it to account for its bad as well as good effects. For by relaxing to a certain degree, it may prove anodyne, cordial, diaphoretic, hypnotic, &c. or cauſe ſtagnations, deliriums, lethargies, apoplexies, and death.

The particular diſorders in which the uſe of opium has been recommended are the following. In moſt continued fevers of this climate, though originating from contagion, or certain corruptions of human effluvia, &c. there is, at the beginning, more or leſs of an inflammatory diatheſis; and while this continues, opium would generally aggravate the ſymptoms, and prove dangerous. Its uſe is likewiſe forbidden in the more advanced ſtage of this fever, whenever topical inflammation of the brain is aſcertained, which ſometimes exiſts and produces delirium, though other ſymptoms of the nervous and putrid kind prevail. But when irritation upon the brain is not of the inflammatory kind, and debility has made much progreſs, or where delirium is accompanied with ſpaſmodic affections, opium is a ſovereign remedy, and may be employed in large doſes every eight hours, unleſs a remiſſion of the ſymptoms and ſleep take place. In typhus, when given in ſmall doſes frequently repeated, opium is an uſeful aſſiſtant to wine and tonics, in ſupporting the vis vitæ; and at the ſame time allays irritation, and obtunds the ſuſceptibility of thoſe morbid impreſſions which occaſion watchfulneſs, delirium, tremors, and ſubſultus tendinum. It ſhould be adminiſtered, however, with caution; for if the heat of the body be much above the natural ſtandard, and the ſkin dry, opium increaſes theſe ſymptoms, augments thirſt, and occaſions reſtleſſneſs. But if moiſture be coming on, opium accelerates it, and tranquillity and ſleep follow. Hence Dr. Currie's advice ſhould be regarded, not to give the evening doſe of opium in theſe fevers till very late, or about one or two o'clock in the morning, when the heat is ſubſiding; or firſt to lower the temperature, and excite ſenſible perſpiration by the affuſion of cold water, or tepid ſponging. Opium is hurtful alſo when there is a diſpoſition to inflammation, particularly in the cheſt, and when there is much determination to the head.

In intermittent fevers, opium, in combination with other medicines, was much uſed by the ancients; but ſince the introduction of the Peruvian bark, it is ſeldom confided in for the cure of theſe diſorders. It has, however, been ſtrongly recommended as an effectual means of ſtopping the recurrence of the febrile ſymptoms; and has been given, before the fit in the cold ſtage, in the hot ſtage, and during the interval, with the beſt effects; producing immediate relief, and in a ſhort time curing the patient, without leaving thoſe abdominal obſtructions which have been aſcribed to the bark. Berryat, who, in the "Mem. prefentés à l'Acad. Royal. des Sci. 1755, t. ii." ſtrongly recommends the uſe of opium in intermittents, and adviſes it to be given along with an infuſion of centaury, an hour before the acceſs of the paroxyſm. Lind (Dif. in hot Climates) prefers giving it half an hour after the commencement of the hot fit. In theſe fevers, perhaps, ſays Dr. Woodville, the beſt practice is to unite opium with the bark, which enables the ſtomach to bear the latter in large doſes, and adds conſiderably to its efficacy.

In inflammatory diſeaſes, the uſe of opium has been much condemned; and Young has eſtabliſhed a general rule, "that opium is improper in all thoſe diſeaſes in which bleeding is neceſſary." This principle, however, has been much diſputed; and it is liable to numerous exceptions, ſpecified by Dr. Cullen in his "Materia Medica."

When opium is ſo managed as to procure ſweat, it will tend to remove an inflammatory ſtate of the ſyſtem, and may prove generally uſeful, of which we have a notable inſtance in the cure of acute rheumatiſm by means of Dover's powder. In this latter diſeaſe it is given united with ipecacuanha, or antimonials and nitre, and always gives relief, when it determines to the ſurface.

For the ſmall-pox, opium, ſince the time of Sydenham, has been very generally and ſucceſsfully preſcribed, eſpecially after the fifth day of the diſeaſe; but during the firſt ſtage of the eruptive fever, it has been ſaid that it always does harm; an opinion which Dr. Woodville's experience at the Small-pox Hoſpital contradicts: for he ſays, that even at that period of the diſorder, we often find the pulſe languid, and the countenance pale, though pains in the loins and the head are at the ſame time very ſevere. Theſe ſymptoms, with reſtleſſneſs, and other ſigns of irritability, which appear for ſome days after the attack of the diſeaſe, are conſiderably relieved by opium; to which, however, we uſually add camphor and vinum antimonii tartariſati, always taking care to keep the body ſufficiently open by the frequent doſe of a proper cathartic. In malignant ſcarlatina, pemphigus, and ſeveral others of the exanthemata, it is equally valuable; but in this claſs of diſeaſes its uſe is contra-indicated, when the fever is inflammatory.

In hæmorrhagic diſorders the uſe of opium is inferred, from its known effects in reſtraining all the excretions, except that of ſweat; but unleſs the hæmorrhages be of the paſſive kind, or excited by irritation, unattended with inflammation, opium may produce conſiderable miſchief, and therefore its uſe in theſe complaints requires great circumſpection. Hence ariſes its efficacy in the floodings of irritable habits after abortions, and in phthifical hæmoptyſis. It has been alſo recommended after blood-letting, in the hæmoptyſis and hæmatemeſis of the later months of pregnancy. In dyſentery, opium may be occaſionally employed to moderate the violence of the ſymptoms. In diarrhœa, eſpecially when the acrimony has been carried off by a continuance of the diſeaſe, opium is a certain and efficacious remedy. In cholera and pyroſis, opium is the remedy chiefly confided in. In chorea Sti. Viti it has been found beneficial, when preceded by ſtrong cathartics, or combined with theſe. In epilepſy it is uſeful, when given in combination with muſk. In ſpaſmodic aſthma it ſhortens the paroxyſms, abates the violence of the cough in pertuſſis, when adminiſtered after the primary fever ſubſides. Although opiates are hurtful at firſt, and check expectoration in catarrh, yet when the cough is obſtinate, their good effects are unqueſtionable; and in the contagious catarrh, or influenza, an opiate at bed-time is requiſite for quieting the cough in every ſtage of the diſorder. In colic it is employed with laxatives, and often prevents ileus and inflammation, by relieving the ſpaſm. Even in ileus and incarcerated hernia, it is often found to allay the vomiting, the ſpaſms, the pain, and ſometimes to diminiſh the inflammation, and prevent the gangrene of the ſtrangulated gut. Opium has been lately recommended for the cure of the lues venerea, and ſome have ſaid that it has ſucceeded when mercury has failed: but however it has been extolled by ſome foreigners, its antivenereal powers have been exploded in this country; though, as an auxiliary to mercury, it has been conſidered as uſeful, by diminiſhing the ſenſibility of the ſtomach and bowels, and thus preventing many of thoſe inconveniences which this mineral is apt to excite in the primæ viæ, and allowing it to be more eaſily introduced into the ſyſtem. Its uſe in preventing and ſtopping the progreſs of gangrene is well eſtabliſhed. Opium is ſucceſsfully uſed in various ſpecies of tetanus, and affords relief to various ſpaſmodic and convulſive ſymptoms occurring in ſeveral diſeaſes. Indeed, in all caſes where the irritability is morbidly increaſed, and where it is of importance to leſſen pain, and procure ſleep, opium is undoubtedly the moſt valuable article of the materia medica. But its uſe is contra-indicated in all morbid ſtates of the body, when a ſtrong inflammatory diatheſis exiſts; in pulmonary affections, when the cough is dry and hard, and the expectoration difficult and ſcanty; and if not hurtful, its utility is doubtful in mania, in which it generally occaſions reſtleſſneſs, inſtead of procuring ſleep.

Although ſome difference of opinion ſubſiſts with regard to the external application of opium, it has been maintained that, externally applied, it is almoſt as efficacious as when it is taken into the ſtomach, and that it produces its narcotic effects without affecting the head, or occaſioning nauſea. Accordingly it has been ſaid, that when applied to the ſkin, it allays pain and ſpaſm, procures ſleep, and produces other ſalutary effects. The uſual mode of applying it is in form of frictions, either combined with oil, or with the camphor liniment, or in the form of tincture; and in this mode it may be uſed in all the diſeaſes above enumerated. Its good effects in colic, alſo in ſymptomatic triſmus, when rubbed on the jaw, and when applied to the ſcrobiculus cordis by means of pledgets ſoaked in the tincture, have been obſerved by medical practitioners. A piece of ſolid opium, ſtuffed into a carious tooth, relieves the pain of tooth-ache; and introduced into the rectum, either in a ſolid form, or diſſolved in water as an enema, affords relief in teneſmus, in painful affections of the proſtate gland, and in ſpaſmodic ſtrictures. A weak watery ſolution of it is an uſeful adjunct to injections in gonorrhœa, and to collyria in ophthalmia; and the vinous tincture dropped into the eye removes the ſuffuſion which often remains in that diſeaſe, after the inflammation has been ſubdued, and reſtores the tone of the diſeaſed organ. One inconvenience following the moderate application of opium, mandragora, and hyoſcyamus for pains of the eyes, taken notice of by Galen, is the midriaſis, or a preternatural dilatation of the pupils. Mr. Ray gives a notable inſtance of this kind, ariſing from the application of a leaf of the deadly nightſhade to a cancerous ulcer a little below the eye. The uvea, in a night's time, entirely loſt its muſcular force, and was ſo relaxed, that the pupil, in the cleareſt light, remained four times bigger than that of the other eye. The effects of opium on other animals are not much different from its effects on men. Applied to the naked nerves of animals, it produces immediate torpor, and loſs of power in all the muſcles with which the nerves communicate. Dr. Alſton put a few drops of a ſolution of opium into a frog's ſtomach, and the circulation of the blood of the animal being examined by a microſcope, no alteration was perceived in the blood, as to its conſiſtence, colour of the ſerum, magnitude, figure, or colour of the red globules; but its velocity was ſurpriſingly diminiſhed. In about half an hour, the blood regained its common celerity, and the frog its vigour. On giving the creature a ſecond doſe, the blood moved ſlower than it did the firſt time, and its velocity gradually decreaſing, ſtagnated firſt in the ſmaller, then in the larger veſſels; and in a quarter of an hour the frog expired. It is remarkable, that notwithſtanding the diminution of the velocity of the blood, the pulſe was not leſs frequent; and that even when the circulation ſtopt in the foot, the pulſe remained viſible by an undulatory motion. On opening the frog, its ſtomach was found full of a clear mucus, tinged with the opium, and every thing alſo ſeemed perfectly natural. This experiment was repeated ſeveral times, with the ſame appearances.

A dog being killed by an injection of a ſolution of opium into his crural vein, on opening his thorax the lungs were found ſound, but very ſmall, and white, without any blood in them. The heart was big, and all its great veſſels diſtended with blood; but nothing preternatural was obſerved in the brain or abdomen.

Opium is exhibited either in ſubſtance as a pill or under

the form of tincture. It is neceſſary, however, to take heed that it be not combined with ſubſtances which decompoſe it; and therefore ſolutions of oxymuriate of mercury, acetate of lead, ſulphates of zinc, iron, and copper; of the carbonates of alkalies, lime-water, infuſion of galls, and infuſion of yellow cinchona bark, are incompatible in preſcriptions with opium.

The requiſite doſe of opium varies in different perſons, and in different ſtates of the ſame perſon. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another, more eſpecially if he has been previouſly accuſtomed to the uſe of it; and a doſe that might prove fatal in cholera or colic, would not be perceptible in many caſes of tetanus or mania. A quarter of a grain, frequently repeated, is in general ſufficient to keep up its ſtimulant effect; and the quantity of from gr. j to gr. ij acts as a narcotic, and produces ſleep; while in tetanus, hydrophobia, and ſome other diſeaſes, ʒvſs of laudanum have been given in twenty-ſix hours, without occaſioning any bad effects, or even producing ſleep. The loweſt fatal doſe to thoſe unaccuſtomed to take it ſeems to be about four grains; but a dangerous doſe is ſo apt to produce vomiting that it has ſeldom time to occaſion death. When given in too ſmall a doſe, it often produces diſturbed ſleep, and other diſagreeable conſequences; and in ſome caſes it ſeems impoſſible to be made to agree in any doſe or form. Often, on the other hand, from a ſmall doſe, ſound ſleep and alleviation of pain will be produced, while a larger one occaſions vertigo and delirium. Some prefer the repetition of ſmall doſes; others give a full doſe at once; its operation is ſuppoſed to laſt about two hours. It is uſe that makes the quantity of opium ſafe, and even beneficial, which would otherwiſe prove poiſonous. Daily experience confirms this; and they who habituate themſelves to opium, find it as neceſſary as ſpirituous liquors to tiplers, and can take fifty or ſixty grains: Charas ſays, that he has taken twelve grains himſelf, and adds, that he knows one who made no ſcruple of thirty-ſix. And in the Phil. Tranſ. we have an inſtance of one Mr. Lovelock, who, in a fever, in three days time, took one hundred and two grains.

A few grains will deſtroy a perſon unaccuſtomed to it; but ſome diſorders, as madneſs, enervate its force. Among the Eaſtern nations, a dram of opium is but a moderate doſe. The Turks are ſaid to take this quantity when they go to battle, or undertake any affair that requires vigour and ſtrength. Garcias mentions one who took ten drams every day, and though ſhe appeared ſtupid and ſleepy, yet ſhe diſputed very readily and learnedly on any ſubject. It is remarkable that, notwithſtanding this exceſſive uſe of opium, the Turks are generally long lived, if we credit Bellonius.

The action of opium is very analogous to that of wine or vinous ſpirits; the good and ill effects of both differ little. See Wedelius in his Opiologia, and Geoffroy's Materia Medica. Platerus affirms that wine is narcotic, and Sydenham, that opium is the moſt excellent cordial in nature.

Dr. Smyth, while at Smyrna, took pains to obſerve what the doſes of opium taken by the Turks, in general, were. He found that three drams in a day were a common quantity among the larger takers of it, but that they could take ſix drams a day without miſchief. A Turk eat this quantity before him, three drams in the morning, and three in the evening, with no other effect than its giving him great chearfulneſs. But the taking it thus habitually greatly impairs the conſtitution; the perſons who accuſtom themſelves to it, can by no means live without it, and are feeble and weak; their legs are uſually thin, and their gums eaten away, ſo that the teeth ſtand bare to the roots; they are alſo often of a yellow complexion, and look much older than they really are. The Turkiſh meſſengers, when ſent upon buſineſs of haſte, always carry opium with them, and take largely of it when tired; they ſay it immediately gives them ſtrength and ſpirits to proceed, taken with proper precaution. Phil. Tranſ. N° 223.

Dr. Ruſſell, in his "Hiſtory of Aleppo," informs us, that the greateſt quantity he knew to be taken, was three drams in twenty-four hours; and the immediate effects which he obſerved it to have on ſuch as were addicted to it, were, that their ſpirits were exhilarated, and from a doſing, depreſſed ſtate into which they ſunk, after paſſing the uſual time of taking their doſe, they became quite alert. The conſequences of a long uſe of it are, that they ſoon look old and befotted, like ſuch as in Europe have ruined their conſtitutions by hard drinking. The habitual uſe of it cannot be too much reprobated. It impairs the digeſtive organs, conſequently the vigour of the whole body, and deſtroys alſo gradually the mental energies. The effects of opium on thoſe who have been addicted to it, ſays Ruſſell, are at firſt obſtinate coſtiveneſs, ſucceeded by diarrhœa and flatulence, with loſs of appetite and a ſottiſh appearance. And it may be conſidered as a point of fact, that they ſeldom live to a good old age: though they are rarely carried off by dropſies or ſuch other diſeaſes, which are the uſual conſequences of hard drinking amongſt us; but having firſt loſt their memory, and moſt of their intellectual faculties, they decline, in all appearance, in the ſame way as thoſe who ſink under the weight of years.

We have an account, in the Memoirs of the Academy of Sciences at Paris, of the death of a young man at Cairo, from his being decoyed into taking a very large doſe of this medicine. Among a number of young people in that city, who frequently drank together, there was one who always boaſted of his ſuperior power to bear a large quantity of liquor; and his companions, determined to get the better of him for once, diſſolved, without his knowing of it, a dram of opium in the liquor he was to drink; the conſequence was, that, inſtead of falling aſleep, as they expected he would, he fell into violent deliriums, and afterwards into a profound and dead ſleep.

The next morning his comrades went to ſee him, and triumphed in their victory, but found him dying, looking livid, without pulſe, and with his mouth cloſed. They ſent for aſſiſtance, but in vain. After the death of the perſon, the body, arms, and thighs, became covered with livid tumours, as big as the head of a young child, and theſe emitted an intolerable ſtench, almoſt as ſoon as the corpſe was cold. There is one very ſingular accident in regard to this caſe, which is, that this ſtench allured all the cats from the neighbouring houſes, who came with great eagerneſs, and were hardly prevented from devouring the body.

The officinal preparations of opium are opium purificatum, confectio opii, electuarium catechu, extractum opii, pilulæ opii, pilulæ ſaponis cum opio, pulvis opiatus, pulvis cornu uſti cum opio, pulvis cretæ comp. cum opio, pulvis ipecacuhanæ comp., tinctura opii, tinctura camphoræ compoſita, tinctura opii ammoniata, and trochiſci glycyrrhizæ cum opio.

The *opium purificatum*, or purified opium, of the Dublin diſpenſatory, is prepared by cutting one pound of opium into ſmall pieces, and digeſting it in 12 pints of proof ſpirit with a gentle heat and frequent agitation, until the opium is diſſolved; then filtering the ſolution through paper; and diſtilling it from a retort to ſeparate the ſpirits; pouring in the reſiduary liquor, and evaporating it until the extract be of a proper thickneſs. Purified

opium

opium muſt be kept in two ſtates; one ſoft, proper for forming pills, and one hard, capable of being reduced to powder.

The *confectio opii* of the London pharmacopeia is prepared by taking 6 drams of hard opium powdered, 1 oz. of long pepper, 2 oz. of ginger root, and 3 oz. of caraway ſeeds; and rubbing the opium in a pint of ſyrup made hot; then adding the remaining articles pulverized, and mixing the ingredients.

The *electuarium opiatum*, or opiate electuary, formerly *electuarium thebaicum* or thebaic electuary of the Edinb. pharm., is compoſed of 6 oz. of aromatic powder, 3 oz. of Virginian ſnake-root in fine powder, half an ounce of opium, diffuſed in a ſufficient quantity of Spaniſh white wine, and a pound of ſyrup of ginger; which ingredients are mixed ſo as to make an electuary.

The operation of the opium in theſe preparations is modified by the aromatics. They are intended as ſubſtitutes for the mithridate and theriaca of the old pharmacopeias. They are ſtimulant narcotics; and are uſefully employed in atonic gout, flatulent colic, and in diarrhœas, unattended with inflammatory ſymptoms. Thirty-ſix grains of the London confection contain 1 grain of opium, and the ſame quantity is contained in 43 of the Edinb. electuary. The doſe is from grs. x to ʒj, given in the form of bolus, or diffuſed in the chalk mixture.

The *electuarium mimoſæ catechu*, olim *confectio Japonica*, electuary of catechu, formerly Japonic confection of Edinb. pharm., is compoſed of 4 oz. of extract of catechu, 3 oz. of kino, of cinnamon bark and nutmegs, of each 1 oz., 2¼ lbs. of opium, diffuſed in a ſufficient quantity of Spaniſh white wine, and 2¼ lbs. of ſyrup of red roſes boiled to the thickneſs of honey. Reduce the ſolid ingredients to powder, and then mix them with the opium and ſyrup ſo as to form an electuary. The *electuarium catechu compoſitum*, or compound electuary of catechu of the Dub. pharm., conſiſts of 4 oz. of catechu, 2 oz. of cinnamon bark, 3 oz of kino; rub theſe to powder, and add of hard refined opium diffuſed 1½ dram in Spaniſh white wine, and 2¼ lbs. of ſyrup of ginger boiled to the conſiſtence of honey; and mix them.

Theſe are uſeful combinations as aſtringents and aromatics; and may be efficaciouſly given in diarrhœas, and the laſt ſtage of dyſentery, either in the form of bolus, or diffuſed in ſome diſtilled water. The doſe is from ℈j to ʒij. Ten ſcruples contain one grain of opium.

The *extractum opii*, extract of opium of the Lond. pharm., is formed by taking ½ lb. of opium ſliced, and 3 pints of water; pouring a ſmall portion of the water upon the opium, and macerating for twelve hours, that it may become ſoft; then adding gradually the remaining water, rubbing them together until they be well mixed, and ſetting the mixture apart that the feculencies may ſubſide; laſtly, ſtraining the liquor, and evaporating it to a proper conſiſtence.

The *extractum opii aquoſum*, or watery extract of opium of the Dub. Ph., is formed by rubbing two ounces of opium in a pint of boiling water for ten minutes, and, after a little time, pouring off the ſolution; then rubbing the reſidue of opium in an equal quantity of boiling water for the ſame time, pouring off this ſolution, and repeating the ſame operation a third time; then mixing together the decanted ſolutions, and expoſing the mixture in a broad open veſſel to the air for two days; and, laſtly, ſtraining it through linen, and by ſlow evaporation forming it into an extract.

From lbſ of crude opium ʒijſs only of extract are obtained by following the directions of the London college. This extract, which is inodorous, of a bitter taſte, and of a very deep brown colour, not altogether ſoluble in water, and not precipitated from its ſolution by alcohol, nevertheleſs affords precipitates with the following ſolutions, which ſhould not therefore enter into preſcriptions with its ſolution, *viz.* ſolutions of aſtringent vegetables. the alkaline carbonates, corroſive muriate of mercury, ſulphate of copper, ſulphate of zinc, acetate of lead, and nitrate of ſilver. This extract is ſuppoſed to poſſeſs the narcotic and anodyne powers of opium, but to produce its effects with leſs ſubſequent derangement of the nervous ſyſtem. It is therefore ſuppoſed to be well adapted for the diſeaſes of children, and of perſons of very irritable habits. The doſe is from gr. j to grs. vi for an adult. The officinal preparation is *ſyrupus opii*. See SYRUP.

For an account of *pills*, *powders*, and *tinctures* of opium, ſee the reſpective articles; and for the officinal preparations of poppy capſules, ſee PAPAVER. Woodville's Med. Bot. Thomſon's London Diſpenſatory.

OPIUM *Cyreniacum*, in the *Materia Medica*, a name given by ſome of the writers of the middle ages to aſſa fœtida. This was the *ſcordolaſaron* of the Greek writers of thoſe times, and was called *Cyreniacum* from the place whence it was principally brought. Avicenna tells us, that, in his time, it was brought principally from Kirvan, and that is Cyrene.

OPIUS, OPII, in *Ancient Geography*, a town of Aſia, near the Euxine ſea, between the mouths of two rivers, and E.S.E. of Trapezus.

OPIZUM, a town of Thrace, between Hadrianopolis and Philippopolis.

OPLITODROMI, Οπλιτοδρομοι, among the Greeks, a deſignation given to thoſe who ran in armour, at the Olympic, and other games.

The word comes from the Greek οπλον, *armour*, and δρομος, *a race*.

OPOBALSAMUM, in *Pharmacy*, a whitiſh juice, gum, or reſin, diſtilled from the branches of a tree, called *balſamum*, or the balſam-tree. See AMYRIS.

To obtain the balſam, the bark is cut by an ax, when the juice is in its ſtrongeſt circulation, in July, Auguſt, and the beginning of September. It is then received into a ſmall earthen bottle, and every day's produce collected and poured into a larger, which is kept cloſely corked. The firſt that flows, called "opobalſamum," is of a light yellow colour, apparently turbid. It afterwards becomes clear, fixed, and heavier; and the colour by degrees to a golden yellow. The "opobalſamum" of the ancients was compoſed of the green liquor found in the kernel of the fruit; the "carpobalſamum," the next in eſteem, was made by the expreſſion of the ripe fruit; and "xylobalſamum," or worſt kind, by the expreſſion or decoction of the ſmall twigs. In the earlier ages, this balſam was eſteemed as a medicine of almoſt univerſal virtue; and at the preſent day the Arabs uſe it in all complaints of the ſtomach and bowels, reckoning it a powerful antiſeptic, and preventive of the plague; but its chief uſe among the Turkiſh ladies is as a coſmetic. It is never brought genuine into this country. See BALSAM *of Gilead*.

OPOCALPASON, OPOCARPASON, οποκαλπασον, οποκαρπασον, the juice of a tree called *calpaſi*; this juice reſembles myrrh, but is poiſonous and deadly, inducing a ſtrangulation. Galen, de Antidot. lib. i. ſays, that in the courſe of his time, he had obſerved the fatal effects in many who had ignorantly taken myrrh mixed with opocalpaſum. For they who prepare antidotes, he ſays, purpoſely mix this as an ingredient, taking it for the beſt ſort of myrrh; becauſe they had obſerved it to be a very good medicine in collyria,

collyria, where it attenuates ſanies without corroſiveneſs, and ſometimes removes an incipient cataract. And if you put, ſays he, this kind of myrrh into a plaſter, cerate, or any attenuating medicine, to be outwardly applied, you will increaſe its virtue, but the effects of it taken into the body are deadly. James.

OPODELDOC, in the *Materia Medica*, the name of a plaſter ſaid to be invented by Mindererus, though often mentioned by Paracelſus. There uſed to be a famous popular ointment under the name of opodeldoc, which, it is ſaid, was thus prepared.

Take of the root of marſhmallows, comfrey, gentian, long birthwort, angelica, of each one ounce and a half; of the herbs ſanicle, ladies' mantle, mouſe-ear, colt's-foot, ſnakeroot, periwinkle, bruiſed, of each half a handful; of the leaves of roſemary, ſage, and lavender, of each one handful; juniper berries, two ounces; cumin ſeeds, one ounce; camphor and caſtor powdered, of each one ounce and a half; and of ſpirit of wine, three pints and a half.

Put all into a glaſs cucurbit, well luted, and digeſt for ten hours in balneo Mariæ, that is in hot water, but not to boil, then ſtrain; and the ſpirit of wine being ſufficiently impregnated with the ingredients, then add one pound of Caſtile ſoap ſhaved thin; digeſt in the ſame manner as before, until the ſoap is diſſolved.

Lute the juncture carefully, with two or three doubles of paper, daubed over with the white of eggs, and tied about with thread; the luting being dried, then digeſt in balneo Mariæ for ten hours, the matraſs being fixed in the middle of the kettle, with a layer of ſtraw under it, to keep it at the diſtance of two inches from the bottom: for the firſt eight hours, keep the water ſo hot about it, that you can ſcarce hold your finger therein; and the two other hours augment the heat, but not ſo much as to make the water boil.

After the ſpirit of wine is thoroughly impregnated with the tincture of the roots, herbs, leaves, and powders, cool it gently, and ſtraining it through a linen cloth, pour it again into the matraſs, with one pound of Caſtile ſoap, ſhaved thin; then fit the veſſel of rencounter to the matraſs; lute the junctures, and digeſt as before, till the ſoap is entirely mixed with the ſpirit, and the whole reduced to an ointment; then take out the matraſs, and ſuffer it to cool.

If the doſes and other directions are duly obſerved, it will be of the conſiſtence of an unguent, neither too thick nor thin, and the method of trying if it is truly prepared, is, to rub ſome of it on your hand, which it will immediately penetrate, leaving only a greeniſh ſtain; though the natural colour of the ointment is brown. It is excellent in ſtrains, relaxations of the ſinews in horſes, as well as in the human kind; alſo in all pains, numbneſs, weakneſs in the joints, or other parts, being well rubbed in. James.

The Edinburgh Pharmacopeia directed the opodeldoc to be made in a much more ſimple manner, *viz.* by digeſting two ounces and a half of Spaniſh ſoap, in a pint of rectified ſpirit of wine, and afterwards adding half an ounce of camphor, a dram of oil of roſemary, and a dram of oil of origanum. See SOAP.

OPODEOCELE, in *Surgery*, a hernia at the foramen ovale of the pelvis. See HERNIA.

OPODIPE, in *Geography*, a town of New Navarre; 170 miles S. of Caſa Grande.

OPOGKA, a town of Ruſſia, in the government of Pſkov, on the Velika. N. lat. 56° 40'. E. long. 29° 14'.

OPOLLA, a town of Poland, in the palatinate of Sandomirz; 30 miles W.S.W. of Sandomirz.

OPOORAGE, a ſmall iſland near the E. ceaſt of New Zealand, a little to the S. of Mercury bay. S. lat. 56° 51'. W. long. 183° 54'.

OPOPANAX, Οποπαναξ, formed from οπος, *juice*, and πανακ, the name of the plant which yields it, or *Opoponax*, in *Pharmacy*, a concrete gummy reſinous juice, of a reddiſh-yellow colour, yellow and ſpeckled with white on the outſide, paler within, and frequently variegated with large white pieces; ſatty, and brittle, of a bitter, acrid, and ſomewhat naufeous taſte, and a very ſtrong, diſagreeable ſmell. Its ſpecific gravity is 1.622. It appears to be a compound of gum, reſin, and eſſential oil.

The Latins call it *panax Herculeum*, from Hercules, who is ſuppoſed to have firſt diſcovered its ſpecific virtues. It is one of the three celebrated panaceas, or univerſal medicines, to which the ancients attributed ſuch wonderful virtues. The two others are the Aſclepium and Chironium; the firſt found by Æſculapius, the ſecond by Chiron.

The gum opopanax flows by inciſion from the roots of a plant (the PASTINACA *Opopanax*, which ſee,) and being dried in the ſun, is brought from Turkey, and the Eaſt Indies, in cheſts; and is ſometimes in tears or drops, but more uſually in irregular lumps. The plant grows abundantly in Achaia, Bœotia, Phocis, and Macedonia. There are three kinds of it imported; that in tears; that in the maſs; and that counterfeited, or flatted. The firſt is the beſt, and the ſecond is the better, as it has the more tears; the third is a rank ſophiſtication, and good for little.

When triturated with water, about one-half of it diſſolves, forming an opaque milky ſolution, which, on ſtanding, depoſits a portion of reſinous matter, and becomes yellowiſh. Alcohol acts upon it freely; and in diſtillation either with it or with water, the odour of the opopanax is very ſtrongly communicated to the fluids, but ſcarcely any oil is obtained in a ſeparate ſtate. This gum-reſin is regarded as anti-ſpaſmodic and emmenagogue, and as ſuch has been uſed in hyſteria and chloroſis; but it is now very ſeldom ordered. The doſe may be from grs. x to 3ſs. Woodville. Thomſon.

OPOPIA, a name given by ſome anatomical writers to the bones which form the receptacle of the eyes.

OPORICE, a name given by the ancients to a medicine compoſed of the autumnal fruits, and extolled for its great virtues againſt weakneſſes of the ſtomach and dyſenteries.

It was compoſed of five quinces with their ſeeds, as many pomegranates, a pint of ſervices, a pint of Syrian ſumach, and half an ounce of ſaffron; all theſe were put together into a gallon of muſt, and boiled over a very gentle fire to the conſiſtence of honey, with great care to avoid burning.

OPORINUS, JOHN, in *Biography*, a learned printer, born at Baſil in 1507, was the ſon of a painter, in indigent circumſtances, named Herbſt. He was inſtructed in the elements of the Latin language by his father, and afterwards paſſed four years at the univerſity of Straſburg, maintaining himſelf by teaching the younger ſtudents, by copying manuſcripts, and correcting the preſs. When, by his ſervices in the cauſe of literature, he felt himſelf of ſufficient conſequence to aſſume a claſſical name, he changed that of Herbſt, ſignifying Autumn or Harveſt, to Oporinus, which has the ſame meaning in the Greek language, and to improve his circumſtances, he married an old lady who was poſſeſſed of a good fortune, the whole of which would have ill compenſated for her crabbed temper; nevertheleſs, at her death the property was transferred to other perſons. He was adviſed to ſtudy phyſic, and engaged himſelf as pupil and ſecretary to the famous Paracelſus. This maſter promiſed to communicate to him ſome medical ſecrets; but failing in the

the performance, Oporinus left him, and ſet up a ſchool for inſtructing young people in the claſſics at Baſil. At length he went into the printing buſineſs, in partnerſhip with a perſon named Robert Winter, who gave himſelf, according to the faſhion of the times, the Greek name of Chimerinus. He was indefatigable in his employment, keeping, by his ſole labour, ſix preſſes at work, and publiſhing no book which he had not corrected himſelf. His induſtry was not requited by good fortune: perhaps he was too much of a ſcholar to be a ſucceſsful man of buſineſs. He died in debt at the age of ſixty-one. Being an accurate judge of manuſcripts, he printed none but the moſt valuable, and he took care that they ſhould appear in the moſt correct form. He was author of many excellent notes upon the books which he printed, and compiled very uſeful tables of contents and indexes of others. His principal writings were "Notes upon Solinus;" "Scholia upon the Tuſculan Queſtions of Cicero;" and alſo upon other works of that author; "Notes upon ſome Parts of Demoſthenes;" "Darii Tiberti Epitome Vitarum Plutarchi ab innumeris mendis repurgata;" "Propriorum Nominum Onomaſticon." Some of his Latin letters are printed in a collection of epiſtles publiſhed at Utrecht in 1697. Moreri.

OPORTO, or PORTO, in *Geography*, the largeſt city, Liſbon excepted, and ſea-port, of Portugal, in the province of Entre Duero é Minho, ſituated on the declivity of a hill, in an elevated ſituation near the river Duero, and about three-fourths of a league from its mouth. It is the chief town of a corregimento, and the ſeat of a corregedor, a provedor, and a military governor, being a place of arms: it is alſo the ſee of a biſhop, who chiefly reſides at Mezanfrio. Murphy ſtates the number of inhabitants at 63,505; but Link, on the authority of the corregedor, eſtimates the population at this time to be about 30,000. Oporto has four ſuburbs, ſeven pariſhes, and twelve religious houſes. On one ſide the remains of the walls and gates ſtill exiſt; otherwiſe the town is quite open, and has no fortifications. It is alſo the ſeat of the high tribunal for the northern provinces. The quay on the river is built without art; on one ſide is a ſtreet, the other ſide is walled and raiſed, though merely for the purpoſe of making ſhips' cables faſt. From the ſtrand riſes a broad well-paved ſtreet, with cauſeways on the ſides, leading to an equally handſome oblique ſtreet. The other ſtreets along the declivity of the hill are narrow, crooked, and dirty; but upon the hill are many fine, broad, ſtraight ſtreets, with a number of new and handſome houſes. All the buildings are regular, light and neat, and this town is allowed to be the cleaneſt in Portugal. The ſteep declivity of the hill on which the town is built renders walking and riding on horſeback or in carriages more laborious than in Liſbon. On the E. ſide of the town, houſes are built againſt ſo ſteep a part of the declivity over the ſtream, that they can only be entered by ſteps cut out of the rock. This inconvenience is compenſated in a degree, particularly to a ſtranger, by their romantic ſituation, and by the proſpect of the oppoſite bank, with its towns, villages, monaſteries, and pine-woods.

At Oporto the manners of the people are very much formed on thoſe of the Engliſh, who are here more numerous and conſiderable, in proportion to the other rich inhabitants, than at Liſbon. They have a kind of Caſino in a handſome building, very well regulated, and adapted to bring foreigners together. Not long ago a play-houſe was erected, which, though ill contrived for hearing, attracts a conſiderable number of attendants to the exhibition of Portugueſe plays, performed by tolerably good actors.

The trade of Oporto, which is well-known to conſiſt chiefly of wine, has ſuffered much in conſequence of the war; and the harbour is ill adapted to be a ſtation for ſhips of war, on account of the difficulty of its entrance. Hence French privateers have been almoſt always hovering within ſight of it; and this circumſtance has ruined many houſes in Oporto. In front of the town the river is very deep; two-maſted veſſels can come to the town itſelf, thoſe with three maſts within a quarter of a league, and the large Brazil ſhips unload their cargoes in the road. From a ſtatement made by Link, it appears that the Engliſh trade to Oporto far exceeds that of all other nations. The country and walks round Oporto are very pleaſant and romantic. The rocks which riſe out of the ſand towards the mouth of the river render the entrance into the harbour extremely narrow and very dangerous. The ſea alſo is very boiſterous on theſe coaſts during the rainy ſeaſon, and the river very rapid; and the ſand which is brought down by the ſtream more and more choaks the paſſage. A ſmall fort, called San Joaõ de Fez, near which is a ſmall market-town, covers the entrance; beſides this, on the coaſt to the northward, is a baſtion on the beech; oppoſite to which, on the S. ſide, is alſo a very ſmall fort, called Santa Caterina, with a few other batteries.

Immediately oppoſite to Oporto, on the S. bank of the Duero, is the appearance of a town not much ſmaller than Oporto itſelf. To the weſtward, along the declivity of a hill, are ſeveral detached houſes, forming the market-town of "Gaya," a place remarkable both for its ſituation and name. Here in former times a place called "Caſe," ſpoken of by the ancients, is ſaid to have ſtood; but Oporto being afterwards built, as more convenient for ſhips, by the greater depth of water along that bank, it was called "Portus Cale," or the harbour of Cale, whence was derived "Portucal," and at length *Portugal*. Thus, as it is ſaid, from this place the whole kingdom afterwards received its name. Portus Cale was in proceſs of time called "O Porto," (the harbour,) which name the town of Oporto afterwards received. Advancing to the eaſtward, we come to a conſiderable and populous town or villa, called "Villanova do Porto," inhabited by the lower claſſes of people, whereas the rich more generally live in Oporto itſelf. Between Villanova and Gaya, on a ſmall plain along the bank of the river, are the immenſe magazines where wine is kept till it is exported. A monaſtery on a high, and toward the river, very ſteep hill, completes the circle of the view to the eaſtward. It is ſaid that the number of inhabitants at Gaya and Villanova, including the detached houſes, reckoned as part of both places, amounts to about 20,000. The mountains along the N. bank conſiſt of granite in rocks: thoſe along the S. bank of ſtratified granite and mica-ſlate. Traces every where appear of metallic veins of copper pyrites, malachite, and other metals; and along the S. bank, particularly, a copper-mine might be opened with great proſpect of ſucceſs.

The climate of Oporto is in winter damp and foggy, in conſequence of its mountainous and woody ſituation; whence alſo the air is cooler than elſewhere, though it ſeldom freezes. On the contrary, in ſummer, the heat is great, both in this narrow valley and the town, which is ſituated on a ſouthern declivity. Here, as well as along the coaſts of Portugal, regular winds prevail in ſummer, *viz.* in the morning the eaſt wind, veering about noon towards the ſouth, and then to the weſt, from which circumſtance navigation receives many advantages. The ſoil, though well cultivated, is not productive; but oranges are brought from Braga and Barcelos, wine from the Upper Duero, and, in ſhort, all thoſe productions which bear the name of this town are not

grown

grown round it, though they are exported from hence. The gardens round Oporto are beautiful and pleafant, and the plants of the Cape and of New Holland grow in the open air with gooſeberries, currants, and other fruits of the colder countries of Europe, which are not ſeen round Liſbon.

The common people are more ſuperſtitious, though not more fanatic, than elſewhere. They are reckoned good-humoured, and thefts and robberies are uncommon. Some inſtances of aſſaſſinations with knives, under the influence of jealouſy, occaſionally occur. The politeneſs and friendly diſpoſition of the people are much commended: their language abounds with diminutives to an exceſs that is often ridiculous. Their dreſs ſomewhat differs from that of the ſouthern provinces; wooden ſhoes being here very common, though not found farther towards the ſouth. Oporto is 49 miles N. of Coimbra. N. lat. 41° 11′. W. long 8° 19′. Link's Travels through Portugal.

OPOS, a word uſed by the old medical writers to expreſs the juices of plants, whether flowing ſpontaneouſly, or by means of inciſions. It is uſed by Hippocrates to exprefs the juice of ſilphium, which was called ſimply the juice, by way of eminence, as we call the quinquina bark ſimply the bark. Others have made it ſignify the juice of the fig-tree, and the caprificus, which they had in frequent uſe to curdle their milk.

OPOSSUM, or Possum, in *Zoology*. See Didelphis.

OPOTSCHNA, in *Geography*, a town of Bohemia, in the circle of Konigingratz; 15 miles N.E. of Konigingratz.

OPOUN, one of the Navigators' iſlands, in the South Pacific ocean, ſituated moſt eaſterly as well as moſt ſoutherly of the whole group: it is alſo called "Toomanua." S. lat. 14° 7′. W. long. 169° 7′.

OPPA, a river of Sileſia, which runs into the Oder; 14 miles S.E. of Troppau.

OPPATOW, a town of Moravia, in the circle of Iglau; 14 miles S. of Iglau.

OPPAU. See Troppau.

OPPEAN, a town of Italy, in the department of Benaco; 13 miles S. of Verona.

OPPELN, a principality of Sileſia, bounded N. by Poland, and the principalities of Breſlau, Oels, and Brieg; E. by Poland; S. by the principalities of Ratibor, Jagerndorf, and Troppau; and W. by thoſe of Neiſſe and Brieg. The ſoil is generally fandy, and many parts are covered with large heaths and foreſts. It contains 27 towns and a few villages.—Alſo, a city of Sileſia, and capital of the abovementioned principality, ſituated on the Oder, and the ſee of a biſhop: fortified after the ancient manner, and containing two convents, a collegiate church, and a college, which formerly belonged to the Jeſuits. The houſes are moſtly wooden ſtructures, and the inhabitants are Roman Catholics; 45 miles S.E. of Breſlau. N. lat 50° 35′. E. long. 17° 58′.

OPPENAU, a town of Baden; 13 miles E. of Straſburg.

OPPENHEIM, a town of France, in the department of Mont Tonnerre, and chief place of a canton, in the diſtrict of Mayence; formerly imperial. The place contains 1674, and the canton 10,735 inhabitants, in 20 communes. The great pariſh church belongs to the Calviniſts, but the Lutherans and Roman Catholics have each their churches. At this place is a good growth of wine; 9 miles S.E. of Mentz. N. lat. 49° 51′. E. long. 8° 20′.

OPPIAN, in *Biography*, a Greek poet and grammarian, was a native of Anarzarba in Cilicia, and flouriſhed in the beginning of the third century. He dedicated two poems, entitled "Halieutica," on fiſhing, and "Cynegetica," on hunting, to the emperor Caracalla; with the latter that ſovereign was ſo much pleaſed, that he gave the author a piece of gold for each line, hence they obtained the name of the *golden verſes*. Both poems have been eſteemed by various modern critics, as well for the force and elegance of the deſcriptions, as for the ingenuity of the thoughts and ſimilies. Oppian likewiſe compoſed a work "On Fowling," with ſome other pieces, which are loſt. He died of the plague at the age of thirty, and was honoured by his townſmen with a ſtatue. The beſt editions of Oppian are thoſe of Ritterhuſius, Lugd. B. 1597; of Schneider, Argent. 1776; and of Bellin de Ballu, Argent. 1785, in two volumes octavo.

OPPIDO, in *Geography*, a town of Naples, in Calabria Ultra; the ſee of a biſhop; deſtroyed by an earthquake in the year 1783; the preſent town is built three miles from the former, which contained about 3000 inhabitants, 1200 of whom periſhed on that occaſion. The loſs of the province, by and in conſequence of this calamity, included about 32,000 perſons. The town is ſituated 27 miles N.E. of Reggio. N. lat. 38° 18′. E. long. 16° 23′.—Alſo, a town of Naples, in Baſilicata; five miles S.S.E. of Acerenza.

OPPIDONEON, Sinaab, in *Ancient Geography*, a town and colony of Africa, in Mauritania Cæſarienſis, where the emperor Claudius formed an eſtabliſhment of veterans. It was ſituated on the ſouthern bank of the river Chinalap, N. of the mountains denominated Zalacus.

OPPIDUM Novum, a town of Gallia Aquitanica, between Beneharnum and Aquæ Convenarum. Anton. Itin.—Alſo, a town of Africa, in Mauritania Tingitana, between Tremulæ and Ad Novas. Id.

OPPIETO, in *Geography*, a town of the iſland of Corſica; eight miles N.N.E. of Ajazzo.

OPPILATION, in *Medicine*, the act of obſtructing or ſtopping up the ducts, or paſſages of the body, by redundant or peccant humours.

The word is chiefly uſed for obſtructions of the lower belly.

Viſcid, heavy foods, difficult of digeſtion, are oppilative; they do not paſs off well, but ſtop in the mouth of the veſſels.

OPPILATIVE. See Deoppilative.

OPPONENS Pollicis, in *Anatomy*, a muſcle of the thumb: it is part of the thenar of Winſlow, and the carpo-metacarpien of Dumas. It lies on the firſt bone of the thumb, immediately under the abductor, and extends from the carpus to the firſt phalanx of the thumb. It ariſes from the annular ligament, and from the os trapezium; its fibres are directed obliquely outwards, and terminate in the whole length of the outer edge of the firſt phalanx of the thumb. It is covered externally by the abductor; and it covers the joint of the thumb with the os trapezium, and the ſurface of the firſt phalanx: the flexor brevis lies along its inner edge, and is often very cloſely connected to it. This muſcle draws the firſt phalanx acroſs the palm, ſo as to bring the thumb into oppoſition to the other fingers, as when we graſp a ſpherical body in one hand, or, in a ſmaller degree, when we hold a pen, pencil, &c.

OPPONENT, a perſon who withſtands or oppoſes another. The term is chiefly uſed in ſpeaking of ſcholaſtic or academic diſputes or exerciſes, where a perſon who oppoſes a theſis, or impugns it by his objections, is called *opponens*, opponent.

OPPOSER, Foreign. See Foreign *Oppoſer*.

OPPOSITES, Opposita, among *Logicians*, are ſuch things as differ among themſelves; but ſo as not to differ in like manner from ſome third.

By which circumſtance, *oppoſites* differ from *diſparates*.

The ſchoolmen reckon four kinds of oppoſites; *viz.* relatively, contrarily, privatively, and contradictorily oppoſites.

Either, ſay they, the oppoſition is between ens and non ens; if the former, it is either with a dependent ens, which makes a relative oppoſition, the loweſt of all; or an independent one, which is a contrary oppoſite: if a non ens, it is either with a non ens ſecundum quid, which is privative; or with a non ens ſimply, which is the higheſt oppoſition.

Opposites, *Oppoſita*, complexly taken, are propoſitions that claſh with each other. As, man is an animal; and man is not an animal.

Opposite *Angles*. See Angle.

Opposite *Cones* denote two ſimilar cones, vertically oppoſite, that is, having the ſame common vertex, as well as the ſame axis. See Cone.

Opposite *Sections* are two hyperbolas made by cutting two oppoſite cones by the ſame plane. See Hyperbola.

OPPOSITION, in *Geometry*, the relation of two things, between which a line may be drawn perpendicular to both.

Opposition, in *Logic*, the quality of diſagreement between propoſitions which have the ſame ſubject, and the ſame attribute.

Oppoſition is ſaid, by logicians, to be either *complex* or *incomplex*.

*Incomplex*, or *ſimple* oppoſition, is the diſagreement of two things, which will not ſuffer each other to be in the ſame ſubject.

Thus heat is oppoſed to cold, ſight to blindneſs, &c. Which oppoſition has already been obſerved to be of four kinds.

*Complex* oppoſition is defined, by Ariſtotle, to be the affirming and denying the ſame predicate of the ſame ſubject, not taken equivocally, but for the ſame, in the ſame manner, and at the ſame time; as, Socrates is learned; and Socrates is not learned.

The later ſchoolmen, deviating from their maſter, define oppoſition an affection of enunciations, whereby two abſolute propoſitions, the ſame extremes being ſuppoſed in the ſame order and number, and underſtood without any ambiguity, of the ſame thing, oppoſe each other, either in reſpect of quantity or of quality, or of both. According to the former definition, there are three ſpecies of oppoſition, *contrary*, *ſubcontrary*, and *contradictory*: according to the ſecond, a fourth ſpecies is admitted, viz. *ſubaltern*.

To know how and wherein propoſitions are oppoſite, they muſt be compared, in quantity and quality, all the ways in which they can be compared. If they be oppoſite both in quality and quantity, *i.e.* if the one be affirmative, and the other negative; the one univerſal, the other particular; they are ſaid to be contradictory; *v. gr.* no pleaſure is allowed; ſome pleaſure is allowed.

If they be only oppoſite in quality, and not in quantity, they are called *contraries*, if univerſal: and *ſubcontraries*, if particular; *v. gr.* all uſe of wine is evil; no uſe of wine is evil. Some means of preſerving reputation are allowed; ſome means of preſerving reputation are not allowed.

If the propoſitions be only oppoſite in quantity, they are called *ſubalterns*: *v. gr.* every man is liable to ſin; ſome man is liable to ſin. But this laſt is no proper oppoſition; inaſmuch as the univerſal propoſition always includes the particular one.

Single propoſitions, which can only be oppoſed in quality, are reducible to contrary ones.

The eſſential properties of propoſitions, conſidered with regard to their oppoſition; are, 1. That of two contradictory propoſitions, there is one always true, and another falſe. 2. Two contradictory propoſitions can never be both true; but may be both falſe. 3. Subcontrary propoſitions may be all true at the ſame time; as happens when the attribute is accidental to the ſubject; but when it is eſſential to it, the one is true, the other falſe. 4. Subalterns may be either true or falſe at the ſame time; or the one may be true, the other falſe. If the attribute be eſſential to the ſubject, the ſubaltern affirmatives are true, and the negatives falſe; but if the negatives deny the ſubject an attribute incompatible with the ſubject, they will be both true. When the attribute is accidental to the ſubject, the univerſal ſubaltern is ordinarily falſe, and the particular one true.

Opposition, in *Rhetoric*, denotes a figure, whereby two things are joined together, which appeared incompatible; as when Horace ſays, a *wiſe folly*.

In Bouhours's notion, this figure, which ſeems to deny what it eſtabliſhes, and contradicts itſelf in appearance, is very elegant. See Antithesis.

Opposition, in *Aſtronomy*, is that aſpect or ſituation of two ſtars or planets, wherein they are diametrically oppoſite to each other, or 180°, that is, a ſemicircle, apart.

When the moon is diametrically oppoſite to the ſun, ſo that ſhe ſhews her whole illumined face; ſhe is ſaid, with regard to the ſun, to be in oppoſition; and ſhe is then ſaid to be *in her full*, and ſhines all night long. See Moon and Phases.

Eclipſes of the moon never happen but when ſhe is in oppoſition with the ſun, and when they both meet in or near the nodes of the ecliptic.

Mars in his oppoſition to the ſun is nearer the earth than he is to the ſun.

OPPS, in *Geography*, a village of America, in Northampton county, Pennſylvania; ſix miles S.E. of Bethlehem.

OPPURG, a town of Saxony, in the circle of Neuſtadt, which has a citadel, and was formerly fortified with walls and towers; four miles W.S.W. of Neuſtadt.

OPSA, a town of Lithuania, in the palatinate of Wilna; 12 miles S.S.W. of Braſlau.

OPSAL, a town of Norway, in the province of Aggerhuus; 40 miles N. of Konſwinger.

OPSICELLA, in *Ancient Geography*, a town of Spain, in Cantubria; built, according to Strabo, by the companions of Antenor, and named by him.

OPSIUKOVA, a town of Ruſſia, in the government of Novgorod, on the Tchegodo; 80 miles E.N.E. of Novgorod.

OPSLO. See Christiania.

OPSO, a town of Iſtria; ſeven miles E.N.E. of Cape d'Iſtria.

OPSONOMUS, in *Antiquity*, a magiſtrate of Athens, of whom there were two or three; choſen out of the ſenate or council.

Their office was to inſpect the fiſh-market, and to take care that every thing was done in order, and according to the laws.

OPTATIVE, in *Grammar*, the third mood in the conjugations of verbs, ſerving to expreſs an ardent deſire or wiſh for any thing.

Inſtead of a particular mood, or a particular ſet of inflexions to expreſs this deſire, the Engliſh, Latins, &c. expreſs it by an adverb of wiſhing prefixed to it. The Latins

by *utinam*; the French by *plut à Dieu*; and the Engliſh by *would to God*, &c.

In theſe languages, ſetting aſide the adverb, the optative is the ſame with the ſubjunctive; the inflexion of the verb, which make what we call the *moods*, being the ſame in both.

Indeed, in the Greek, the wiſh is expreſſed by a particular inflexion, thence called optative; and in the French, Spaniſh, and Italian, there is ſomething like it; their triple ſenſes ſerving the ſame purpoſe. But the optative mood may be ſafely retrenched from the Latin and Engliſh. See MOOD.

OPTERIA, formed from οπτομαι, *I ſee*, among the *Ancients*, preſents made to a child the firſt time a perſon ſaw it.

OPTERIA was alſo uſed for the preſents which the bridegroom made his bride when ſhe was conducted to him; this being the firſt time he ſaw her. See Barthol. de Puerp. vet.

OPTIC, or OPTICAL, ſomething that relates to *viſion*, or the ſenſe of ſeeing. See VISION.

OPTIC *Angle*. See ANGLE.

OPTIC *Axis*. See AXIS.

OPTIC *Chamber*. See CAMERA *Obſcura*.

OPTIC *Glaſſes*, are glaſſes ground either concave or convex; ſo as either to collect or diſperſe the rays of light; by means of which viſion is improved, and the eye ſtrengthened, preſerved, &c.

For the manner of grinding and poliſhing optic glaſſes; ſee GRINDING, POLISHING, GLASS, &c. For their phenomena, ſee LENS, MIRROR, &c.

The principal among optic glaſſes are teleſcopes, microſcopes, ſpectacles, reading glaſſes, magic lanterns, &c. See the conſtruction and uſe of each under its proper article, TELESCOPE, MICROSCOPE, SPECTACLE, MAGIC *Lantern*, &c.

OPTIC, or *Optical Inequality*, in *Aſtronomy*, is an apparent irregularity in the motions of far diſtant bodies; ſo called, becauſe not really in the moving bodies, but ariſing from the ſituation of the ſpectator's eye; ſo that if the eye were in the centre, it would always ſee the motions uniform.

The optical inequality may be thus illuſtrated: ſuppoſe a body revolving in the periphery of a circle A B D E F G Q P (*Plate* XV. *Optics*, *fig.* 22.) and moving through equal arcs A B, B D, D E, E F, in equal times; and ſuppoſe the eye in the plane of the ſame circle, but at a diſtance from it, viewing the motion of the body from O: when the body goes from A to B, its apparent motion is meaſured by the angle A O B, or the arc H L, which it will ſeem to deſcribe. But in an equal time, while it moves through the arc B D, its apparent motion will be determined by the angle B O D, or the arc L M, which is leſs than the former arc H L. And when arrived at D, it will be ſeen at the point M of the line N L M. But it ſpends the ſame time in deſcribing D E, as it does in A B or B D; and when arrived at E, it is ſtill ſeen at M; appearing ſtationary in all the ſpace from D to E. When it arrives at F, the eye will ſee it in L; and at G, it will appear at H; ſo it will ſeem to have gone retrograde: and, laſtly, from Q to P, it will again appear ſtationary.

OPTIC *Nerves*, in *Anatomy*, the ſecond pair of nerves, ſpringing from the crura of the medulla oblongata, and paſſing thence to the eye. See NERVOUS *Syſtem*. See alſo VISION.

OPTIC *Nerves, Diminiſhed Senſibility of*. See GUTTA *Serena*.

OPTIC *Penſil*. See PENCIL *of Rays*.

OPTIC *Place* of a ſtar, &c. See PLACE.

OPTIC *Pyramid*, in *Perſpective*, is the pyramid whoſe baſe is the viſible object, and its vertex in the eye; formed by rays drawn from the ſeveral points of the perimeter to the eye.

Hence alſo may appear what is meant by optic triangle.

OPTIC *Rays* are particularly uſed for thoſe with which an optic pyramid, or optic triangle, is terminated.

OPTICS, OPTICA, is properly the ſcience of direct *viſion*; which ſee.

OPTICS is alſo uſed, in a larger ſenſe, for the ſcience of viſion, or viſibles in general.

In which ſenſe, optics includes *catoptrics*, and *dioptrics*: and even *perſpective*; which ſee reſpectively.

OPTICS, in its more extenſive acceptation, is a mixed mathematical ſcience, which explains the manner by which viſion is performed in the eye; treats of ſight in the general; gives the reaſons of the ſeveral modifications or alterations which the rays of light undergo in the eye; and ſhews why objects appear ſometimes greater, ſometimes ſmaller, ſometimes more diſtinct, ſometimes more confuſed, ſometimes nearer, and ſometimes more remote. In this extenſive ſignification, it is conſidered by ſir Iſaac Newton in his admirable work called "Optics."

Optics makes a conſiderable branch of natural philoſophy; both as it explains the laws of nature, according to which viſion is performed; and as it accounts for abundance of phyſical phenomena, otherwiſe inexplicable. For what can be determined about light, colours, tranſparency, opacity, meteors, the rainbow, parhelia, &c. but on the principles of optics? What about the nature of the ſtars? The ſtructure of the mundane ſyſtem? The motions of the planets? The eclipſes of the luminaries? &c. Optics, therefore, makes a conſiderable part of aſtronomy.

It was the opinion of Pythagoras, that viſion is cauſed by particles continually flying from the ſurfaces of bodies, and entering the pupil of the eye: whereas Empedocles and Plato ſuppoſed, that the cauſe of viſion is ſomething emitted from the eye, which meeting with ſomething elſe that proceeds from the object, is thereby reflected back again. But though the Platonic philoſophers were miſtaken as to the progreſs of viſion, they were acquainted with two very important and fundamental principles of this ſcience; *viz.* that light, from whatſoever it proceeds, is propagated in right lines, differing in this reſpect from ſound; and that when it is reflected from the ſurfaces of poliſhed bodies, the angle of incidence is equal to the angle of reflection.

Ariſtotle, amidſt the variety of other objects that engaged his attention, did not overlook the ſcience of optics, though many of his obſervations were fanciful and erroneous. Thus we find, that he maintained, in oppoſition to Empedocles, that light is incorporeal; conceiving that if it were not a mere quality, but a real ſubſtance, the motion of it could not be inſenſible, in paſſing from the eaſt to the weſt, though it might eſcape our notice in a ſmaller diſtance. His remarks on the rainbow, halos, and other phenomena of a ſimilar nature, which were claſſed by the ancients under the denomination of meteors, though, in ſome reſpects, blended with error, are nevertheleſs, in other reſpects, juſt and true, and have led to a more unexceptionable and philoſophical account of the cauſes that produce them, and the various circumſtances that attend them. Indeed, the knowledge of the ancients in this department of ſcience was very imperfect and limited; though they ſeem to have been acquainted with the refraction as well as the reflexion of light. It appears, that the ancient geometricians contented themſelves

ſelves with deducing a ſyſtem of optics from the two principles above-mentioned: and the treatiſe of optics, which has been aſcribed to Euclid, is employed about determining the apparent ſize and figure of objects from the angle under which they appear, or which the extremities of them ſubtend at the eye, and the apparent place of the image of an object reflected from a poliſhed mirror; which he fixes at the place where the reflected ray meets a perpendicular to the mirror drawn through the object. But this work of the ancient mathematician is ſo imperfect, and ſo inaccurate, that moſt perſons have heſitated in aſcribing it to this celebrated author. The latter part of Euclid's work is employed in inveſtigating the phenomena of plane, convex, and concave mirrors. The magnifying power of concave mirrors is mentioned both by Seneca and Pliny. The effects of burning-glaſſes were obſerved by the ancients; and the power of concave mirrors in this reſpect is taken notice of by Euclid in the treatiſe we have mentioned. It has been ſaid, and very generally allowed, that Archimedes wrote a treatiſe on the ſubject of burning mirrors, though it be not now extant. From the time of Euclid to Seneca, who repeats the crude ſentiments of Ariſtotle, together with ſome of his own, concerning the rainbow, we find nothing worthy of being particularly detailed on the ſubject of optics. Ptolemy, who lived 150 years after Chriſt, wrote a treatiſe of optics, which is loſt; but from the accounts of others it is known, that he treated of aſtronomical refractions. After Ptolemy there occurs a great chaſm in the hiſtory of optics, as well as other branches of mathematics and philoſophy, which were cultivated chiefly by the Arabs during the dark ages of Europe. The firſt Arabian writer of optics, of whom we have any account, is Al Farabi, who flouriſhed 900 years after Chriſt, but of his work we know nothing. The treatiſe of Ebn Haithem, who in the year 1000 wrote more largely on this ſubject, and who treated diſtinctly of direct, reflected, and refracted viſion, and alſo of burning mirrors, is loſt. The only work of the Arabian philoſophers that remains is that of Alhazen, who flouriſhed in the 12th century; and his treatiſe of optics is well worthy of attention. He gives a tolerable deſcription of the eye, and diſcourſes largely concerning the nature of viſion, maintaining that the cryſtalline humour of the eye is of principal uſe for this purpoſe, without conſidering it as a lens, and aſſerting that viſion is not completed, till the ideas of external objects are conveyed by the optic nerves to the brain. He accounts for ſingle viſion by two eyes, by ſuppoſing that when two correſponding parts of the retina are affected, the mind perceives but one image: and he treats much at large of optical deceptions both in direct viſion, and alſo in viſion by reflected and refracted light. Alhazen alſo inquired concerning the nature of refraction more than any of the ancient writers; and from aſtronomical obſervations he deduced ſeveral properties of atmoſpherical refraction: firſt of all advancing, that the ſtars are ſometimes ſeen above the horizon by means of refraction, when they are really below it. This obſervation was confirmed by Vitellio, B. Waltherus, and Tycho Brahe. Alhazen alſo obſerved, that refraction contracts the diameters and diſtances of the heavenly bodies, and that it is the cauſe of the twinkling of the ſtars: though it is probable that neither he nor Vitellio knew any thing of its juſt quantity. About the year 1500, great attention was paid to this ſubject by Bernard Walther, Mæſtlin, and others, but chiefly by Tycho Brahe. Vitellio, a native of Poland, illuſtrated Alhazen's optics, in a treatiſe publiſhed in 1270. This work contains every thing valuable in that of Alhazen, and it is digeſted in a much more methodical and intelligible manner. He notices the light that is loſt by reflection and refraction, by reaſon of which all objects appear leſs luminous. The reſult of his experiments on the refractive powers of air, water, and glaſs, correſponding to different angles of incidence, he reduced into a table. In his account of the horizontal moon, he agrees with Alhazen, obſerving, that, in the horizon, the ſky ſeems to touch the earth, and appears much more diſtant from us than in the zenith, on account of the intermediate ſpace containing a greater variety of objects upon the viſible ſurface of the earth. He aſcribes the twinkling of the ſtars to the motion of the air, in which the light is refracted; and he ſhews that refraction, as well as reflection, is neceſſary to form the rainbow. He defines the colours of the rainbow to be three, and makes many other obſervations on its phenomena. Vitellio attempts to explain refraction, or to aſcertain the law of it, and he conſiders the foci of glaſs ſpheres, and the apparent ſize of objects ſeen through them; but Montucla ſays, that he is not at all accurate upon any of theſe ſubjects. Ten years after the publication of Vitellio's work, Peccam, archbiſhop of Canterbury, wrote a treatiſe of direct optics, which was then called perſpective; but without making any addition to the exiſting ſtock of optical knowledge. His treatiſe is ſaid to be conciſe and judicious, and to contain, among other things, a very clear and diſtinct account of the reaſon why the ſky near the horizon appears more diſtant from us than at any other place. As contemporary with Vitellio and Peccam, was Roger Bacon, who frequently quotes Alhazen on the ſubject of optics, and who does not ſeem, as far as reſpects the theory of optics, to have much improved on the Arabian writer. From the writings of Alhazen, and Bacon's obſervations and experiments, ſome monks, it is probable, gradually ſucceeded in the conſtruction of ſpectacles. The uſe of concave as well as convex glaſſes for the aſſiſtance of viſion, whoever might have firſt ſuggeſted it, was particularly explained by Maurolycus. Bacon made approaches, to ſay the leaſt of them, towards the diſcovery and actual conſtruction of teleſcopes and microſcopes. To Maurolycus, teacher of mathematics at Meſſina, we are indebted for ſome capital improvements in the ſcience of optics. This writer, in his treatiſe "De Lumine et Umbra," publiſhed in 1575, demonſtrates that the cryſtalline humour of the eye is a lens, that collects the rays of light that iſſue from external objects, and throws them upon the retina, in which is the focus of each pencil: and hence he was led to diſcover the reaſon why ſome perſons are ſhort-ſighted and others long-ſighted; and why the former are relieved by concave glaſſes, and the latter by thoſe that are convex. But he does not ſeem to have found, that the rays of light iſſuing, in pencils, from every point of an object, make a real image of it upon the retina. About the ſame time that Maurolycus made ſuch great advances towards the diſcovery of the nature of viſion, Johannes Baptiſta Porta, of Naples, invented the camera obſcura, an account of which he publiſhed in his "Magia Naturalis," about the year 1560, when he was not quite fifteen years old. This work was republiſhed thirty years after, with great enlargements. On its firſt publication, it was immediately tranſlated into Italian, French, Spaniſh, and Arabic, and paſſed through many editions in various countries. Porta's diſcovery ſuggeſted a hint to Kircher, of which he availed himſelf by the conſtruction of the magic lantern, doing that in the night, and in many reſpects more conveniently, which Porta exhibited in the day. Notwithſtanding Porta's experiments with the camera obſcura, and ſeveral juſt concluſions which he deduced from them, he erroneouſly conceived that the cryſtalline humour received

the

the images of objects; and Kepler was the perſon, who, in 1604, firſt obſerved that the retina is the tablet on which the images of external objects are depicted. Kircher's diſcoveries are contained in his work entitled "Ars magna Lucis et Umbræ." But our limits will not allow our particularizing more, either of his or of Porta's improvements in optics. Referring to the article RAINBOW an hiſtorical account of obſervations relating to this phenomenon by Maurolycus, B. Porta, Fletcher of Breſlau, and Antonio de Dominis, and to the articles TELESCOPES and MICROSCOPES the diſcoveries relating to theſe inſtruments, we ſhall proceed to conſider the ſervices done to the ſcience of optics by the famous John Kepler. He not only explained the rationale of the teleſcope which he found in uſe, but pointed out methods of conſtructing others of ſuperior powers, and more commodious application. To him we are principally indebted for an explanation of the doctrine of refraction through mediums of different forms, though ſomething of this kind had previouſly been done by Maurolycus; and thus he led the way to the illuſtration of the rationale of teleſcopes and microſcopes. Beſides the doctrine of lenſes, and the rationale of teleſcopes, &c. depending upon it, we are indebted to Kepler for his attention to ſeveral other branches of optical ſcience, particularly the buſineſs of refraction, and the nature of viſion. The ſame age that produced Kepler was ſtill more diſtinguiſhed by Galileo, who threw new light upon almoſt every ſubject of philoſophical inquiry. Beſides the part he took in the conſtruction and uſe of teleſcopes, which we ſhall more particularly notice under that article, he firſt conceived the thought of meaſuring the velocity of light, and he gives a particular deſcription of his contrivance for this purpoſe in his treatiſe on mechanics.

Although Des Cartes was very eminent in the ſcience of optics, he does not ſtand ſingle in the period at which he lived. Beſides Snellius, who led the way to the diſcovery of the great law of refraction, he had other illuſtrious contemporaries; particularly the famous Scheiner, a Jeſuit, who died in the ſame year with Des Cartes. He carried into execution the ſchemes of Kepler, for conſtructing teleſcopes upon plans different from that of the original or Galilean one; and ſhares with Galileo the merit of diſcovering the ſpots of the ſun. His treatiſe entitled "Oculus" is very valuable, and abounds with ingenious and important illuſtrations of the nature of viſion. Gaſſendi, alſo a contemporary of Des Cartes, wrote largely on the ſubject of light, and the natural phenomena which depend upon it; but he adhered cloſely to the ſyſtem of Epicurus, in oppoſition to that of Ariſtotle, maintaining the materiality of light, and aſſerting that bodies are viſible by means of particles continually detaching themſelves from their ſurfaces. Gaſſendi, however, made no particular diſcovery in optics: and he is to be ranked rather among the ſchoolmen than the philoſophers. Du Hamel, the firſt ſecretary to the Royal Academy of Sciences at Paris, in his "Aſtronomia Phyſica," publiſhed in 1681, examined the opinions of Epicurus, as defended by Gaſſendi, and the Carteſian hypotheſis; and after a laboured refutation of them both, pleads ſtrongly in favour of the Ariſtotelian doctrine of light. We might here alſo mention Aguilonius, a Jeſuit of Bruſſels, who publiſhed a large treatiſe on optics in 1613. But Athanaſius Kircher, who was one of the ableſt philoſophers and mathematicians of the age in which he lived, merits peculiar notice. He was about the ſame age with Des Cartes, but outlived him thirty years. His large and magnificent work, already mentioned, and entitled "Ars magna Lucis et Umbræ," muſt, at the time in which it is written, have been conſidered as a very capital performance; and though this author diſcovered no new property of light, he contributed very much to the extenſion and improvement of the ſcience of optics. Kircher took great pains in forming, from natural experiments, a table of the angles of refraction, correſponding to any given angle of incidence, even to a minute of a degree, with reſpect to air and water; and he obſerved the degrees with regard to wine, oil, and glaſs. This table is contained in the work already cited. At length the diſcovery of the true law of refraction was made, in part, by Willebrod Snellius, profeſſor of mathematics at Leyden. He did not live to publiſh it himſelf, but it was communicated to ſeveral perſons before it appeared in the writings of Des Cartes, who publiſhed it under a different form, without acknowledging his obligations to Snellius, whoſe papers, as Huygens aſſures us, from his own knowledge, Des Cartes had ſeen. Snellius was led to the important diſcovery, not by any reaſoning á priori, but by experiments. The diſcovery was, that the co-ſecants of the angles of incidence and refraction are always in the ſame ratio; if the medium be air and water, the ratio is 4 to 3, if air and glaſs, it is 3 to 2 nearly. Des Cartes publiſhed this law as the reſult of his own inquiries into the nature of reflection and refraction. But he gives it under a different form from that of Snellius, and, in general, a more commodious one; for, according to him, the ſine of the angle of refraction always bears the ſame proportion to the ſine of the angle of incidence. Des Cartes ſeems to have been the firſt perſon who attempted to explain the cauſe of refraction, which he did by the reſolution of forces, on the principles of mechanics: ſuppoſing that light paſſes with more eaſe through a denſe medium than a rare one. The truth of this explanation was queſtioned by M. Fermat; who, in oppoſition to Des Cartes, aſſerted that light ſuffers more reſiſtance in water than in air, and more in glaſs than in water; and he maintained, that the reſiſtance of different mediums, with reſpect to light, is in proportion to their denſities. M. Leibnitz adopted the ſame general idea: for the reſult of their mode of reaſoning, ſee REFRACTION. Dechales explained the law of refraction by another hypotheſis, which was adopted by Dr. Barrow, if he was not the author of it: for an account of this alſo we refer to REFRACTION.

One of the moſt conſiderable improvements in optical knowledge made by Des Cartes was his explication of the *rainbow*; which ſee. Scheiner made ſeveral important obſervations relating to viſion at this period; completing the diſcovery that viſion is performed by means of the images of external objects upon the retina. By cutting away the coats of the back part of the eyes of ſheep and oxen, and preſenting ſeveral objects before them, within the uſual diſtance of viſion, he ſaw their images diſtinctly and beautifully painted upon the naked retina. He did the ſame with the human eye; and exhibited this curious experiment at Rome in the year 1625. Scheiner particularly notices the correſpondence between the eye and the camera obſcura, and explains a variety of methods to make the images of objects erect. As to the images of objects being inverted in the eye, he acquieſces in the reaſon for it aſſigned by Kepler, *viz.* that the mind traces the progreſs of the rays to the pupil, and refers them to that part of the object from which they, at that place, ſeemed to have proceeded. That the pupil of the eye is enlarged, in order to view remote objects, and that it is contracted while we are viewing thoſe that are near, is a fact with which Scheiner was well acquainted, and which he proved by experiments, and illuſtrated by figures. Scheiner took conſiderable pains in aſcertaining the denſity and refractive power of all the humours of the eye; and concludes, that the aqueous humour does not differ much

from water in this reſpect, nor the cryſtalline from glaſs, and that the vitreous humour is a medium between them both. He alſo traced the progreſs of the rays of light through all the humours of the eye, and after diſcuſſing every hypotheſis concerning the ſeat of viſion, demonſtrates that it is the retina, ſhewing that this was the opinion of Alhazen, Vitellio, Kepler, and all the moſt eminent philoſophers. Des Cartes well explains the natural methods of judging of the magnitudes, ſituations, and diſtances of objects by the direction of the optic axes; comparing it to a blind man's judging of the diſtance and ſize of an object, by feeling at it with two ſticks of a known length, when the hands in which he holds them are at a known diſtance from each other. Under the article VISION we ſhall mention ſome other obſervations of this ingenious philoſopher that pertain to this ſubject.

Some time before the age of Des Cartes, and alſo during his time, philoſophers began to ſpeculate concerning the poſſibility of what Archimedes is ſaid to have effected with burning mirrors, in deſtroying the fleet of Marcellus; and obſerving that the focal diſtance of concave ſpeculums was much too ſmall for the purpoſe, the ſtory was diſcredited, and rejected as a fable, particularly by Des Cartes. Kircher, and his pupil Schottus, however, thought the ſubject worthy of a more particular inveſtigation, eſpecially as Proclus is ſaid to have deſtroyed a fleet at Conſtantinople by the ſame means. Kircher, with a view of terminating the diſpute, made a number of experiments; and at length determined to try the effect of many plane mirrors. Accordingly he erected a frame, on which he placed five of theſe mirrors, of the ſame ſize, and ſo diſpoſed as to throw the rays that were reflected from them, upon the ſame place, at the diſtance of more than 100 feet; and theſe five mirrors produced ſo great a degree of heat, that he had no doubt but that, by multiplying them, he could have ſet fire to inflammable ſubſtances at a greater diſtance. A drawing of this machine may be ſeen in Kircher's "Ars magna Lucis et Umbræ." Intent upon this ſubject, Scheiner, after many trials, made a voyage to Syracuſe, in company with Scottus, to take a view of the place and of the ſuppoſed tranſaction; and they both concluded that the galleys of Marcellus could not have been more than 30 paces from Archimedes. See BURNING *Glaſſes*.

The controverſy concerning the nature of light was revived at this period by the hypotheſis of Des Cartes, who maintained that light is neither a ſubſtance, as Epicurus and ſome others had ſuppoſed, nor yet a mere property of bodies, as Ariſtotle conceived; but the motion of a ſubtle fluid, communicated inſtantaneouſly by the preſſure of a luminous body. Inſtead of the perfectly ſolid globules, in the motion of which Des Cartes thought that light conſiſted, Malebranche ſubſtituted fluid vortices, and ſuppoſed that every impreſſion communicated to any one of them is immediately tranſmitted to thoſe that are contiguous to it, ſo that the propagation of light is ſimilar to that of ſound. The later Carteſians in general ſuppoſed, that the fluid by which light is tranſmitted is elaſtic, and M. Huygens further modified the Carteſian hypotheſis, imagining the waves of light to ſpread, not circularly, but in ellipſes; and upon this ſuppoſition he endeavoured to explain the phenomena of Iſland cryſtal. Des Cartes was embarraſſed by his hypotheſis concerning light in forming his ideas concerning colours. He advanced that light is affected by two kinds of motion, direct and circular. When the circular motion is quicker than the direct, the colour, he ſays, is red; if the direct be quicker, it is blue; but if they be equal, it is yellow; and out of theſe three colours it was long the opinion of many philoſophers, that all the reſt were formed, by different proportions in their mixture. Notwithſtanding this embarraſſment and error with reſpect to the nature of light, and colours, he juſtly diſtinguiſhes between black and white; obſerving that the former ſuffocates, or extinguiſhes the rays that fall upon it; whereas the latter reflects them. Kepler thought that black objects became hot ſooner than white ones, becauſe the former are of a more dry and inflammable nature. While Kircher was at Rome in 1639, he had an opportunity of examining a report that was current concerning the cameleon; *viz.* that it could aſſume the colour of any object near which it was placed, except thoſe that were white or red; he found that there was no grounds for the exception of theſe two colours; this power he aſcribes to the imagination of the animal, as it loſes it when it is dead. Kircher was the firſt who obſerved the remarkable properties of the infuſion of lignum nephriticum, the optical phenomena of which have been the ſubject of various diſcuſſion from his time to that of ſir Iſaac Newton, who firſt explained them ſatisfactorily. In the ſubſequent period, ſeveral philoſophical ſocieties were formed, which very much contributed to the improvement of optics, as well as other ſciences. The perſons who diſtinguiſhed themſelves at this time were Dr. Hooke, ſecretary to the Royal Society, father Grimaldi in Italy, De la Hire, M. Marriotte, M. Perrault, among the French, and particularly M. Huygens, who compoſed a treatiſe of Dioptrics, of which Newton always profeſſed a very high opinion. Otho Guericke and father Cherubin alſo deſerve mention. The greateſt diſcovery that was made during the period to which we have now advanced in the hiſtory of optics was the velocity with which light is tranſmitted. Galileo attempted to meaſure it, but failed; the academy del Cimento purſued the ſubject according to the mode propoſed by Galileo; need we be ſurpriſed at their want of ſucceſs? At length the object was accompliſhed by Roemer. (See LIGHT.) The honourable Mr. Boyle made a variety of experiments in order to diſcover the firſt principles and cauſes of colours, and the conſtitution of bodies on which they depend; but the enumeration of them would require a detail, for which we have not room. The facts concerning lignum nephriticum, ſuggeſted by Kircher, were fully aſcertained by Mr. Boyle, who alſo corrected ſeveral of the haſty obſervations of Kircher concerning the colours that appear in the infuſion of this ſubſtance. In this tincture he obſerved the difference between reflected and tranſmitted light. The principal phenomena of this infuſion are eaſily explained by the Newtonian doctrine of the different refrangibility and reflexibility of the rays of light, and the diſpoſition of particular bodies to reflect ſome kinds of rays and to tranſmit others; ſo that if the reflected light fall upon the eye, they ſhall appear to be of one colour, when by the tranſmitted light they appear to be of another. The firſt diſtinct account of the colours exhibited by thin plates, of various ſubſtances, occurs among the obſervations of Mr. Boyle. The ſubject was purſued by Dr. Hooke; and he was the firſt to obſerve, if not to deſcribe, the beautiful colours that appear in thin plates of Muſcovy glaſs. Mr. Hauksbee about this time made many experiments by means of a priſm for aſcertaining the refractive powers of different fluids; and he drew up a table that exhibited their ſpecific gravities, the angles at which they were obſerved, and the ratio of refraction. Dr. Hooke firſt ſuggeſted the idea of making allowance for the effect of the refraction of light in paſſing from the higher and rarer, to the lower and denſer region of the atmoſphere, in the computed height of mountains; and thus he accounts for the difference among authors with regard to the height of ſeveral very high hills. For an account of the diſcovery of the *inflection* of light we

refer

refer to that article, and for the ſeat of viſion, &c. to CHOROIDES, EYES, RETINA, and VISION.

The firſt perſons who diſtinguiſhed themſelves in grinding teleſcopic glaſſes were two Italians, *viz.* Euſtachio Divini at Rome, and Campani, of ſuperior fame, at Bologna. For the hiſtory of the invention and improvements of the refracting and reflecting teleſcopes, and microſcopes, ſee TELESCOPE and MICROSCOPE. Of all the diſcoveries that have been made at any time, concerning the nature of light and colour, thoſe of ſir Iſaac Newton are pre-eminent, and they are compriſed in his "Optics." The principal of them were communicated to the Royal Society, ſeven or eight years after they were made, in a letter to the ſecretary Mr. Oldenburgh, dated Cambridge, Jan. 18. 1672. (See COLOUR and REFRANGIBILITY.) See alſo REFRACTION and REFLEXION. Sir Iſaac Newton's improvement of teleſcopes will appear under that article. The obſervations that were made in reference to the Bolognian phoſphorus will be detailed under PHOSPHORUS, &c. and the concluſions deduced from them with regard to the materiality of light will be found under LIGHT, &c. The velocity of light, firſt aſcertained by Roemer, was farther inveſtigated by Dr. Bradley and Mr. Molyneux, in 1725. (See LIGHT.) At and after this period the ſcience of optics received great improvements from the obſervations and experiments of Mr. Melville, the marquis de Courtivron, M. Boſcovich, M. Clairaut, M. Muſchenbroeck, M. Bouguer, M. Buffon, the Abbé Mazeas, Melville, M. Du Tour, M. Euler, Mr. Dollond, the duke de Chaulnes, Mr. Lambert, Mr. Canton, M. de la Hire, Dr. Porterfield, Dr. Jurin, Dr. Motte of Dantzic, biſhop Berkeley, Dr. Barrow, Mr. Robins, Dr. Smith, Delaval, Mr. Michell, &c. &c.; but our limits will not allow our particularly enumerating them in this place; and it is the leſs neceſſary to do it, as they occur under appropriate articles in various parts of the Cyclopædia.

We ſhall cloſe this article with obſerving that we have an excellent and comprehenſive work on Optics, by Dr. Smith, 4to.; another by Mr. Harris, 4to.; and an elaborate Hiſtory of the preſent State of Diſcoveries relating to Viſion, Light, and Colours, by Dr. Prieſtley, 4to. 1772.

But as the ſcience of optics conſtitutes a very diſtinguiſhing branch of natural philoſophy, we have treatiſes of optics in every comprehenſive ſyſtem of philoſophy; ſo that it would be endleſs to enumerate the various writers on this ſubject.

From optics likewiſe ariſes perſpective, all the rules of which have their foundation in optics. Indeed Tacquet makes perſpective a part of optics; though John, archbiſhop of Canterbury, in his "Perſpectiva Communis," calls optics, catoptrics, and dioptrics, by the name *perſpective*.

This art, for ſo it ſhould be conſidered rather than as a ſcience, was revived, or re-invented, in the 16th century. It owes its birth to painting, and particularly to that branch of it which was employed in the decoration of the theatre. Vitruvius informs us, that Agatharchus, inſtructed by Æſchylus, was the firſt who wrote upon this ſubject; and that afterwards the principles of this art were more diſtinctly taught by Democritus and Anaxagoras, the diſciples of Agatharchus. How they deſcribed the theory of this art we are not informed, as their writings have been loſt: however, the revival of painting in Italy was accompanied with a revival of this art; and the firſt perſon who attempted to lay down the rules of perſpective was Pietro del Borgo, an Italian. He ſuppoſed objects to be placed beyond a tranſparent tablet, and endeavoured to trace the images, which rays of light, emitted from them, would make upon it. The book, which he wrote upon this ſubject, is not now extant; and this is the more to be regretted, as it is very much commended by the famous Egnazio Dante. Upon the principles of Borgo, Albert Durer conſtructed a machine, by which he could trace the perſpective appearance of objects. Balthazar Paruſſi, having ſtudied the writings of Borgo, endeavoured to make them more intelligible. To him we owe the diſcovery of points of diſtance, to which all lines that make an angle of 45° with the ground line are drawn. Soon after, Guido Ubaldi, another Italian, found that all the lines, which are parallel to one another, and to the horizon, if they be inclined to the ground line, converge to ſome point in the horizontal line; and that through this point, alſo, a line drawn from the eye, parallel to them, will paſs. Theſe principles combined enabled him to make out a pretty complete theory of perſpective. Great improvements were made in the rules of perſpective by ſubſequent geometricians, particularly by profeſſor Graveſande, and ſtill more by Dr. Brook Taylor, whoſe principles are, in a great meaſure, new, and much more general than thoſe of any perſon before him. Although Dr. Taylor really invented his excellent method of perſpective, yet it is ſuggeſted by Mr. Robins, that the ſame method was publiſhed by Guido Ubaldi, in his "Perſpective," printed at Peſaro in 1600. In this treatiſe, the method is delivered very clearly, and confirmed by moſt excellent demonſtrations. In the laſt book, Ubaldi applies his method to the delineation of the ſcenes of a theatre; and in this, as far as the practice is concerned, he is followed by ſignor Sabatellini, in his "Practica di fabricar Scene," of which there was a new edition at Ravenna in 1638; and to this was added a ſecond book, containing a deſcription of the machines uſed for producing the ſudden changes in the decorations of the ſtage. We are indebted to the opticians of a much later period for ingenious devices to apply the knowledge they had of optics, and eſpecially of perſpective, to the purpoſes of amuſement. See ANAMORPHOSIS.

The principles and practice of *perſpective* will be illuſtrated at large under that article.

OPTIMATES, in *Antiquity*, one of the diviſions of the Roman people, oppoſed to *populares*.

According to Tully's deſcription, the optimates were the beſt citizens, or thoſe who deſired their actions might be approved by the better ſort; and the populares thoſe, who, out of a thirſt of vain-glory, did not ſo much conſider what was right, as what would pleaſe the populace, and get an intereſt in them.

Others rather make the optimates to be the vigorous aſſertors of the dignity of the chief magiſtrate, and the ſticklers for the grandeur of the ſtate; who cared not if the inferior members ſuffered, if it were for the advancement of the commanding powers: and the populares, thoſe who courted the favour of the populace, and encouraged them to demand larger privileges, to bring matters nearer to a level.

OPTIO, among the Romans, an aſſiſtant or lieutenant belonging to every centurion.

They were called *optiones*, from *opto, I chooſe*; becauſe it was in the option of the centurion to chooſe whom he pleaſed for this employment; though at firſt it was otherwiſe, the optio being choſen by the tribune or chief commander of the legion.

The optiones were not peculiar to the camp, but were uſed alſo in many other offices of life.

OPTION, the power or faculty of wiſhing, or chooſing; or the choice a perſon makes of any thing.

When a new ſuffragan biſhop, whether created or tranſlated,

lated, is confirmed, the archbiſhop of the province, by a cuſtomary prerogative, claims the collation of the firſt vacant benefice, or dignity, in that ſee, according as he ſhall chooſe; which choice is called the archbiſhop's option.

Ever ſince archbiſhop Cranmer's time, the mode hath been to convey the advowſon, either of the firſt dignity or benefice that ſhould fall, or of ſome one certain, to the archbiſhop, his executors, or aſſigns, at firſt for 21 years, and afterwards for the next avoidance.

But in caſe the biſhop dies, or is tranſlated, before the preſent incumbent of the promotion choſen by the archbiſhop ſhall die or be removed, it is generally ſuppoſed that the option is void; inaſmuch as the granter, ſingly and by himſelf, could not convey any right or title beyond the term of his continuance in that ſee. And if the archbiſhop dies before the avoidance ſhall happen, the right of filling up the vacancy ſhall go to his executors or adminiſtrators.

OPTO-KILTEKAI, in *Geography*, a town of Chineſe Tartary. N. lat. 44° 8′. E. long. 92° 54′.

OPTOMETER, an inſtrument invented by Dr. Porterfield, and ſo named by him from its uſe in meaſuring the limits of diſtinct viſion, and in determining with great exactneſs the ſtrength and weakneſs of ſight. See his "Treatiſe on the Eye," vol. i. p. 423. The principles of its conſtruction have alſo been explained by Dr. Thomas Young, and an improved inſtrument for the ſame purpoſe has been deſcribed by him, in the Phil. Tranſ. vol. xci. part i. p. 34, &c. Let an obſtacle be interpoſed between a radiant point R (*Plate* XVII. *Optics*, *fig.* 1.) and any refracting ſurface, or lens C D, and let this obſtacle be perforated at two points, A and B, only. Let the refracted rays be intercepted by a plane, ſo as to form an image on it. Then it is evident, that when this plane, E F, paſſes through the focus of refracted rays, the image formed on it will be a ſingle point. But if the plane be advanced forwards to G H, or removed backwards to I K, the ſmall pencils, paſſing through the perforations, will no longer meet in a ſingle point, but will fall on two diſtinct ſpots of the plane, G, H, I, K; and, in either caſe, form a double image of the object. Let us now add two more radiating points, S and T (*fig.* 2.); the one nearer to the lens than the firſt point, the other more remote; and when the plane, which receives the images, paſſes through the focus of rays coming from the firſt point, the images of the ſecond and third points muſt both be double (*ss*, *tt*); ſince the plane, E F, is without the focal diſtance of rays coming from the fartheſt point, and within that of rays coming from the neareſt. Upon this principle Dr. Porterfield's optometer was founded. But if the three points be ſuppoſed to be joined by a line, and this line to be ſomewhat inclined to the axis of the lens, each point of the line, except the firſt point R (*fig.* 3.), will have a double image; and each pair of images, being contiguous to thoſe of the neighbouring radiant points, will form with them two continued lines, and the images being more widely ſeparated as the point which they repreſent is farther from the firſt radiant point, the lines, *st*, *st*, will converge on each ſide towards *r*, the image of this point, and there will interſect each other. The ſame happens when we look at any object through two pin-holes, within the limits of the pupil. If the object be at the point of perfect viſion, the image on the retina will be ſingle; but in every other caſe, the image being double, we ſhall appear to ſee a double object: and if we look at a line pointed nearly to the eye, it will appear as two lines, croſſing each other in the point of perfect viſion. For this purpoſe, the holes may be converted into ſlits, which render the images nearly as diſtinct, at the ſame time that they admit more light. The number may be increaſed from two to four, or more, whenever particular inveſtigations render it neceſſary.

The optometer may be made of a ſlip of card-paper, or of ivory, about eight inches in length, and one in breadth, divided longitudinally by a black line, which muſt not be too ſtrong. The end of the card muſt be cut, as is ſhewn in *fig.* 4, in order that it may be turned up, and fixed in an inclined poſition by means of the ſhoulders; or a detached piece, nearly of this form, may be applied to the optometer, as it is here engraved. A hole about half an inch ſquare muſt be made in this part; and the ſides ſo cut as to receive a ſlider of thick paper, with ſlits of different ſizes, from a 40th to a 10th of an inch in breadth, divided by ſpaces ſomewhat broader; ſo that each obſerver may chooſe that which beſt ſuits the aperture of his pupil. In order to adapt the inſtrument to the uſe of preſbyopic eyes, the other end muſt be furniſhed with a lens of four inches focal length; and a ſcale muſt be made near the line on each ſide of it, divided from one end into inches, and from the other according to the table annexed; by means of which, not only diverging, but alſo parallel and converging rays from the lens are referred to their virtual focus. The inſtrument is eaſily applicable to the purpoſe of aſcertaining the focal length of ſpectacles required for myopic or preſbyopic eyes. Our author, having been furniſhed by Mr. Cary with the numbers and focal lengths of the glaſſes commonly made, calculated the diſtances at which theſe numbers muſt be placed on the ſcale of the optometer, ſo that a preſbyopic eye may be enabled to ſee at eight inches diſtance, by uſing the glaſſes of the focal length placed oppoſite to the neareſt croſſing of the lines; and a myopic eye with parallel rays, by uſing the glaſſes indicated by the number that ſtands oppoſite their fartheſt croſſing. To facilitate the obſervations, theſe numbers are placed oppoſite that point which will be the neareſt croſſing to myopic eyes; but this, upon the arbitrary ſuppoſition of an equal capability of change of focus in every eye, which is often far from the truth. It cannot be expected, that every perſon, on the firſt trial, will fix preciſely upon that focus which beſt ſuits the defect of his ſight. Few can bring their eyes at pleaſure to the ſtate of full action, or of perfect relaxation; and a power, two or three degrees lower than that which is thus aſcertained, will be found ſufficient for ordinary purpoſes. To the ſecond table are added ſuch numbers as will point out the ſpectacles neceſſary for a preſbyopic eye, to ſee at 12 and at 18 inches reſpectively: the middle ſeries will perhaps be the moſt proper for placing the numbers on the ſcale. The optometer ſhould be applied to each eye; and, at the time of obſerving, the oppoſite eye ſhould not be ſhut, but the inſtrument ſhould be ſcreened from its view. The place of interſection may be accurately aſcertained, by means of an index ſliding along the ſcale. The optometer is repreſented in *figs.* 5 and 6; and the manner in which the lines appear in *fig.* 7.

TABLE I. For extending the Scale by a Lens of four Inches Focus.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 2.00 | 11 | 2.93 | 30 | 3.52 | 200 | 3.92 | — 35 | 4.51 | — 12 | 6.00 |
| 5 | 2.22 | 12 | 3.00 | 40 | 3.64 | ∞ | 4.00 | — 30 | 4.62 | — 11 | 6.29 |
| 6 | 2.40 | 13 | 3.06 | 50 | 3.70 | — 200 | 4.08 | — 25 | 4.76 | — 10 | 6.67 |
| 7 | 2.55 | 14 | 3.11 | 60 | 3.75 | — 100 | 4.17 | — 20 | 5.00 | — 9.5 | 6.90 |
| 8 | 2.67 | 15 | 3.16 | 70 | 3.78 | — 50 | 4.35 | — 15 | 5.45 | — 9.0 | 7.20 |
| 9 | 2.77 | 20 | 3.33 | 80 | 3.81 | — 45 | 4.39 | — 14 | 5.60 | — 8.5 | 7.56 |
| 10 | 2.86 | 25 | 3.45 | 100 | 3.85 | — 40 | 4.44 | — 13 | 5.78 | — 8.0 | 8.00 |

TABLE II. For placing the Numbers indicating the focal Length of Convex Glaſſes.

| Foc. | VIII. | XII. | XVIII. | Foc. | VIII. | XII. | XVIII. | Foc. | VIII. | XII. | XVIII. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 8.00 | 12.00 | 18.00 | 20 | 13.33 | 30.00 | 180.00 | 8 | ∞ | — 24.00 | — 14.40 |
| 40 | 10.00 | 17.14 | 32.73 | 18 | 14.40 | 36.00 | ∞ | 7 | — 56.00 | — 16.80 | — 11.45 |
| 36 | 10.28 | 18.00 | 36.00 | 16 | 16.00 | 48 00 | — 144.00 | 6 | — 24.00 | — 12.00 | — 9.00 |
| 30 | 10.91 | 20.00 | 45.00 | 14 | 18.67 | 84.00 | — 63.00 | 5 | — 13.33 | — 8 57 | — 5.92 |
| 28 | 11.20 | 21.00 | 50.40 | 12 | 24.00 | ∞ | — 36 00 | 4.5 | — 10.29 | — 7.20 | — 6.00 |
| 26 | 11.56 | 22.29 | 58.50 | 11 | 29.33 | — 132.00 | — 28.29 | 4.0 | — 8.00 | — 6.00 | — 5.14 |
| 24 | 12.00 | 24.00 | 72.00 | 10 | 40.00 | — 60 00 | — 22.50 | 3.5 | — 6.22 | — 4.54 | — 4.34 |
| 22 | 12.77 | 26.40 | 90.00 | 9 | 72.00 | — 36.00 | — 18.00 | 3.0 | — 4.80 | — 4.00 | — 3.6 |

TABLE III. For Concave Glaſſes.

| Number. | Focus and furtheſt Place. | Neareſt Place. | Number. | Focus and furtheſt Place. | Neareſt Place. | Number. | Focus and furtheſt Place. | Neareſt Place. |
|---|---|---|---|---|---|---|---|---|
| 0 | | 4.00 | 7 | 8 | 2.67 | 14 | 3.00 | 1.71 |
| 1 | 24 | 3.43 | 8 | 7 | 2.54 | 15 | 2.75 | 1.63 |
| 2 | 18 | 3.27 | 9 | 6 | 2.40 | 16 | 2.50 | 1.94 |
| 3 | 16 | 3.20 | 10 | 5 | 2.22 | 17 | 2.25 | 1.44 |
| 4 | 12 | 3.00 | 11 | 4.5 | 2.12 | 18 | 2.00 | 1.33 |
| 5 | 10 | 2.86 | 12 | 4.0 | 2.00 | 19 | 1.75 | 1.22 |
| 6 | 9 | 2.77 | 13 | 3.5 | 1.87 | 20 | 1.50 | 1.02 |

OPUAGO, in *Geography*, a town of America, in Tioga county and ſtate of New York; 15 miles N.W. of New York.

OPULUS, in *Botany*. See VIBURNUM.

OPUNTIA. See CACTUS.

OPUS, in *Geography*, an iſland of Dalmatia, at the mouth of the Narenza. This iſland receives from the floods of the Narenza an acceſſion of ſoil, which makes a difference in height of ten feet, between the Roman times and the preſent; and yet this iſland is not every where capable of cultivation, the ſoil being marſhy, and through want of induſtry and activity undrained. Herbage of all ſorts, Indian corn, wheat and olives in particular, ſucceed wonderfully; and mulberry trees are ſo luxuriant, that the ſilk worms by feeding on them yield very fine ſilk. The vines do not ſucceed, becauſe they remain for a conſiderable part of the year under water, eſpecially in the place between the river Narenza and the Norin, oppoſite to Mercovich, a village well inhabited by healthy labourers and brave people.

OPUTO, a town of New Navarre; 210 miles S.S.E. of Caſa Grande.

OQUENDO, a town of Spain, in the province of Alava; five miles S.E. of Orduna.

OR, or ORE, a lake of Norway, in the province of Aggerhuus; 36 miles N. of Chriſtiania.

OR, in *Heraldry*, *yellow*, or the colour of gold.

Without this colour, or argent, ſilver, there can be no good armory.

In the coats of nobles, it is called *topaz*; and in thoſe of ſovereign princes, *ſol*. It is repreſented in engravings by ſmall points, or dots, all over the field, or bearing.

It is acounted the ſymbol of wiſdom, temperance, faith, force, conſtancy, &c.

*Toiſon d'*OR. See TOISON.

ORA, in *Antiquity*, was a term equivalent to an ounce; but it has been much debated among our antiquaries, whether the ora, the mention of which ſo often occurs, was a coin, or only money of account. Dr. Hickes obſerves, that the mode of reckoning money by marks and oras was never known in England till after the Daniſh ſettlements; and by examining the old nummulary eſtimates among the principal Gothic ſtates upon the Baltic, it appears that the ora and ſolidus were ſynonimous terms, and that the ora was the eighth part of the mark. From ſeveral of the Daniſh laws, it likewiſe appears that the Daniſh ora, derived by corruption from *aureus*, was the ſame as the Frank ſolidus of twelve

pence. As a weight, the ora was regarded as the uncia, or unit, by which the Daniſh mark was divided; and in Domeſday book the ora is uſed for the ounce, or the twelfth part of the nummulary Saxon pound, and the fifteenth of the commercial; as a coin, it was an aureus or the Frank ſolidus of twelve pence. And from the accidental coincidence of the Frank aureus with the eighth part of their mark, the Danes probably took occaſion to give it the new name of ora. There was another ora, mentioned in the rolls of the 27th of Henry III. the value of which was ſixteen pence; and this was probably derived from the half mancus of the Saxons. Such, in all appearance, was the original of theſe two oras; as there were no aurei of that period, to which theſe two denominations of money of ſixteen and twelve pence can poſſibly be aſcribed. It is obſerved farther, that the name ora diſtinguiſhes the gold coins in ſeveral parts of Europe to this day. The Portugueſe moidore is nothing elſe but *moeda d'oro*, from the Latin *moneta de auro:* the French *Louis d'ores* come from the ſame uſe of the word, and owe their appellation to the ora. Clarke on Coins, p. 307, &c.

Ora *Cabaça*, in *Geography*, a bay on the N. coaſt of Jamaica.

ORABY, a town of Sweden, in the province of Schonen; 32 miles S. of Chriſtianſtadt.

ORACH, or Orache, in *Botany*. See Atriplex.

Orach, *Orache*, or *Stinking Gooſe-foot*, in *Botany* and the *Materia Medica*. See Chenopodium *Olidum*.

Orach, *Berry-Bearing*. See Blitum.

Orach, *Creeping ſhrubby*. See Atraphaxis.

Orach, *Wild*. See Chenopodium.

Orach, in *Geography*, a town of Boſnia, the capital of a Sangiacate; 96 miles S.S.W. of Belgrade.

ORACHAU, a lake of Sileſia, in the principality of Glogau; five miles N.N.E. of Kontop.

ORACLE, an anſwer, uſually couched in very dark and ambiguous terms, ſuppoſed to be given by dæmons of old, either by the mouths of their idols, or by thoſe of their prieſts, to the people, who conſulted them on things to come.

Oracle is alſo uſed for the dæmon who gave the anſwer, and the place where it was given. See Dæmon.

Seneca defines oracles to be enunciations by the mouths of men of the will of the gods: and Cicero ſimply calls them the language of the gods, "Deorum oratio." Among the Pagans they were held in high eſtimation; and they were conſulted on a variety of occaſions, pertaining to natio al enterpriſes and private life. When they made peace or war, enacted laws, reformed ſtates, or changed the conſtitution, they had in all theſe caſes recourſe to the oracle by public authority. Alſo, in private life, if a man wiſhed to marry, if he propoſed to take a journey, or to engage in any buſineſs of importance, he repaired to the oracle for counſel. Mankind have had always a propenſity to explore futurity; and conceiving that future events were known to their gods, who poſſeſſed the gift of prophecy, they ſought information and advice from the oracles, which in their opinion were ſupernatural and divine communications. The inſtitution of oracles ſeemed to gratify the prevalent curioſity of mankind, and proved a ſource of immenſe wealth, as well as authority and influence, to thoſe who had the command of them. Accordingly every nation, in which idolatry has ſubſiſted, had its oracles, by means of which impoſture practiſed on ſuperſtition and credulity.

The principal oracles of antiquity are that of Abæ, mentioned by Herodotus; that of Amphiaraus at Oropus in Macedonia; that of the Branchidæ at Didymus; that of the camps at Lacedæmon; that of Dodona; that of Jupiter Ammon; that of Nabarca, in the country of the Anariaci, near the Caſpian ſea; that of Trophonius, mentioned by Herodotus; that of Chryſopolis; that of Claros, in Ionia; that of Amphilochus at Mallus; that of Patarea; that of Pello in Macedonia; that of Phaſelides in Cilicia; that of Sinope in Paphlagonia: that of Orpheus's head at Leſbos, mentioned by Philoſtratus, in the life of Apollonius, &c.

But of all oracles, the oracle of Apollo Pythius at Delphi was the moſt celebrated; this was conſulted in the *dernier reſſort*, by moſt of the princes of thoſe ages. See Delphi and Pythia.

We have already obſerved that moſt of the Pagan deities had their appropriate oracles. Apollo had the greateſt number: ſuch as thoſe of Claros, of the Branchidæ, of the ſuburbs of Daphne at Antioch, of Delos, of Argos, of Troas, Æolis, &c. of Baiæ in Italy, and others in Cilicia, in Egypt, in the Alps, in Thrace, at Corinth, in Arcadia, in Laconia, and in many other places enumerated by Van Dale. Jupiter, beſides that of Dodona and ſome others, the honour of which he ſhared with Apollo, had one in Bœotia, under the name of Jupiter the Thunderer, and another in Elis, one at Thebes and at Meroe, one near Antioch, and ſeveral others. Æſculapius was conſulted in Cilicia, at Apollonia, in the iſle of Cos, at Epidaurus, Pergamus, Rome, and elſewhere: Mercury had oracles at Patras, upon Hæmon, and in other places: Mars in Thrace, Egypt, and elſewhere: Hercules at Cadiz, Athens, in Egypt, at Tivoli, in Meſopotamia, where he iſſued his oracles by dreams, whence he was called "Somnialis:" Iſis, Oſiris, and Serapis delivered in like manner their oracles by dreams, as we learn from Pauſanias, Tacitus, Arrian, and other writers: that of Amphilochus was alſo delivered by dreams: the ox Apis had alſo his oracle in Egypt. The gods, called Cabiri, had their oracle in Bœotia: Diana, the ſiſter of Apollo, had ſeveral oracles in Egypt, Cilicia, Epheſus, &c. Thoſe of Fortune at Prænеſte and of the Lots at Antium are well known. The Fountains alſo delivered oracles, for to each of them a divinity was aſcribed: ſuch was the fountain of Caſtalia at Delphi, another of the ſame name in the ſuburbs of Antioch, and the prophetic fountain near the temple of Ceres in Achaia. Juno had ſeveral oracles; one near Corinth, one at Nyſa, and others at other places. Latona had one at Butis in Egypt: Leucothea had one in Colchis: Memnon in Egypt; Machaon at Gerania in Laconia; Minerva had one in Egypt, in Spain, upon mount Ætna, at Mycenæ and Colchis, and in other places. Thoſe of Neptune were at Delphos, at Calauria, near Neoceſarea, and elſewhere. The Nymphs had theirs in the cave of Corycia. Pan had ſeveral, the moſt famous of which was that in Arcadia. That of the Palici was in Sicily. Pluto had one at Nyſa. Saturn had oracles in ſeveral places, but the moſt famous were thoſe of Cumæ in Italy and of Alexandria in Egypt. Thoſe of Venus were diſperſed in ſeveral places, at Gaza, upon mount Libanus, at Paphos, in Cyprus, &c. Serapis had one at Alexandria, conſulted by Veſpaſian. Venus Aphacite had one at Aphaca between Heliopolis and Byblus. Geryon, the three-headed monſter, ſlain by Hercules, had an oracle in Italy near Padua, conſulted by Tiberius; that of Hercules was at Tivoli, and was given by lots, like thoſe at Prænеſte and Antium. The demi-gods and heroes had likewiſe their oracles, ſuch were thoſe of Caſtor and Pollux at Lacedæmon, of Amphiaraus, of Mopſus in Cilicia, of Ulyſſes, Amphilochus, Sarpedon in Troas, Hermione in Macedonia, Paſiphae in Laconia, Chalcas in Italy, Ariſtæus in Bœotia, Autolycus at Sinope, Phryxus among the Colchi, Zamolxis among the Getæ, Epheſtion

the minion of Alexander, and Antinous, &c. &c. for which we refer to Van Dale. The reſponſes of oracles were delivered in a variety of ways: at Delphi, they interpreted and put into verſe what the prieſteſs pronounced in the time of her fury.

Mr. Bayle obſerves, that at firſt it gave its anſwers in verſe; and that it fell at length to proſe, upon the people's beginning to laugh at the poorneſs of its verſification. The Epicureans made this the ſubject of their jeſts, and ſaid, in raillery, it was ſurprizing enough, that Apollo, the god of poetry, ſhould be a much worſe poet than Homer, whom he himſelf had inſpired. By the railleries of theſe philoſophers, and particularly thoſe of the Cynics and Peripatetics, the prieſts were at length obliged to deſiſt from the practice of verſifying the reſponſes of the Pythia, which, according to Plutarch, was one of the principal cauſes of the declenſion of the oracle of Delphos.

At the oracle of Ammon, the prieſts pronounced the reſponſe of their god; at Dodona, the reſponſe was iſſued from the hollow of an oak; at the cave of Trophonius, the oracle was inferred from what the ſuppliant ſaid before he recovered his ſenſes; at Memphis, they drew a good or bad omen, according as the ox Apis received or rejected what was preſented to him, which was alſo the caſe with the fiſhes of the fountain of Limyra. The ſuppliants, who conſulted the oracles, were not allowed to enter the ſanctuaries where they were given; and accordingly care was taken, that neither the Epicureans nor Chriſtians ſhould come near them. In ſeveral places, the oracles were given by letters ſealed up, as in that of Mopſus, and at Mallus in Cilicia. Oracles were frequently given by lot, the mode of doing which was as follows: the lots were a kind of dice, on which were engraven certain characters or words, whoſe explanations they were to ſeek on tables made for the purpoſe. The way of uſing theſe dice for knowing futurity, was different, according to the places where they were uſed. In ſome temples, the perſon threw them himſelf; in others, they were dropped from a box; whence came the proverbial expreſſion, "the lot is fallen." This playing with dice was always preceded by ſacrifices and other cuſtomary ceremonies. (See SORTES, &c.) The ambiguity of the oracles in their reſponſes, and their double meaning, contributed to their ſupport.

Ablancourt obſerves, that the ſtudy or reſearch of the meaning of oracles was but a fruitleſs thing; and that they were never underſtood till after their accompliſhment. Hiſtorians relate, that Crœſus was tricked by the ambiguity and equivocation of the oracle:

Κροισος Αλυν διαβας μεγαλην αρχην καταλυσει.

Thus rendered in Latin:

"Crœſus Halym ſuperans magnam pervertet opum vim."

Thus, if the Lydian monarch had conquered Cyrus, he overthrew the Aſſyrian empire; if he himſelf was routed, he overturned his own. That delivered to Pyrrhus, which is compriſed in this Latin verſe,

"Credo equidem Æacidas Romanos vincere poſſe,"

had the ſame advantage; for, according to the rules of ſyntax, either of the two accuſatives may be governed by the verb, and the verſe be explained, either by ſaying the Romans ſhall conquer the Æacidæ, of whom Pyrrhus was deſcended, or thoſe ſhall conquer the Romans. When Alexander fell ſick at Babylon, ſome of his courtiers, who happened to be in Egypt, or who went thither on purpoſe, paſſed the night in the temple of Serapis, to enquire if it would not be proper to bring Alexander to be cured by him. The god anſwered, it was better that Alexander ſhould remain where he was. This in all events was a very prudent and ſafe anſwer. If the king recovered his health, what glory muſt Serapis have gained by ſaving him the fatigue of the journey! If he died, it was but ſaying he died in a favourable juncture after ſo many conqueſts; which, had he lived, he could neither have enlarged nor preſerved. That is actually the conſtruction they put upon the reſponſe; whereas had Alexander undertaken the journey, and died in the temple, or by the way, nothing could have been ſaid in favour of Serapis.

When Trajan had formed the deſign of his expedition againſt the Parthians, he was adviſed to conſult the oracle of Heliopolis, to which he had no more to do but ſend a note under a ſeal. That prince, who had no great faith in oracles, ſent thither a blank note; and they returned him another of the ſame. By this Trajan was convinced of the divinity of the oracle. He ſends back a ſecond note to the god, wherein he enquired, whether he ſhould return to Rome after finiſhing the war he had in view. The god, as Macrobius tells the ſtory, ordered a vine, which was among the offerings of his temple, to be divided into pieces, and brought to Trajan. The event juſtified the oracle; for the emperor dying in that war, his bones were carried to Rome, which had been repreſented by that broken vine. As the prieſts of that oracle knew Trajan's deſign, which was no ſecret, they happily deviſed that reſponſe, which, in all events, was capable of a favourable interpretation, whether he routed and cut the Parthians in pieces, or if his army met with the ſame fate.

Sometimes the reſponſes of the oracles were mere banter, as in the caſe of the man who wiſhed to know by what means he might become rich, and who received for anſwer from the god, that he had only to make himſelf maſter of all that lay between Sicyon and Corinth. Another wanting a cure for the gout, was anſwered by the oracle, that he was to drink nothing but cold water.

There are two points in diſpute on the ſubject of oracles; *viz.* whether they were human, or diabolical machines; and whether or not they ceaſed upon the publication or preaching of the goſpel.

Moſt of the fathers of the church ſuppoſed that the devil iſſued oracles; and looked on it as a pleaſure he took to give dubious and equivocal anſwers, in order to have a handle to laugh at them. Voſſius allows that it was the devil who ſpoke in oracles; but thinks that the obſcurity of his anſwers was owing to his ignorance as to the preciſe circumſtances of events. That artful and ſtudied obſcurity, in which the anſwers were couched, ſays he, ſhewed the embarraſs the devil was under; as theſe double meanings they uſually bore provided for their accompliſhment. Where the thing foretold did not happen accordingly, the oracle, forſooth, was miſunderſtood.

Euſebius has preſerved ſome fragments of a philoſopher, called Oenomaus; who, out of reſentment for his having been ſo often fooled by the oracles, wrote an ample confutation of all their impertinencies: "When we come to conſult thee," ſays he to Apollo, "if thou ſeeſt what is in futurity, why doſt thou uſe expreſſions that will not be underſtood? Doſt thou not know, that they will not be underſtood? If thou doſt, thou takeſt pleaſure in abuſing us; if thou doſt not, be informed of us, and learn to ſpeak more clearly. I tell thee, that if thou intendeſt an equivoque, the Greek word whereby thou affirmedſt, that Crœſus ſhould overthrow a great empire, was ill choſen; and that it could ſignify nothing but Crœſus's conquering

Cyrus. If things muſt neceſſarily come to paſs, why doſt thou amuſe us with thy ambiguities? What doſt thou, wretch as thou art, at Delphi; employed in muttering idle prophecies!"

But Oenomaus is ſtill more out of humour with the oracle, for the anſwer which Apollo gave the Athenians, when Xerxes was about to attack Greece with all the ſtrength of Aſia. The Pythian declared, that Minerva, the protectreſs of Athens, had endeavoured in vain to appeaſe the wrath of Jupiter; yet that Jupiter, in complaiſance to his daughter, was willing the Athenians ſhould ſave themſelves within wooden walls; and that Salamis ſhould behold the loſs of a great many children, dear to their mothers, either when Ceres was ſpread abroad, or gathered together.

Here Oenomaus loſes all patience with the god of Delphi. "This conteſt," ſays he, "between father and daughter is very becoming the deities! It is excellent, that there ſhould be contrary inclinations and intereſts in heaven. Poor wizard, thou art ignorant whoſe the children are, that Salamis ſhall ſee periſh; whether Greeks or Perſians. It is certain they muſt be either one, or the other; but thou needeſt not to have told ſo openly, that thou kneweſt not which. Thou concealeſt the time of the battle under thoſe fine poetical expreſſions, *either when Ceres is ſpread abroad, or gathered together;* and wouldeſt thou cajole us with ſuch pompous language? Who knows not, that if there be a ſea-fight, it muſt either be in ſeed-time or harveſt? It is certain it cannot be in winter. Let things go how they will, thou wilt ſecure thyſelf by this Jupiter, whom Minerva is endeavouring to appeaſe. If the Greeks loſe the battle, Jupiter proved inexorable to the laſt; if they gain it, why then Minerva at length prevailed."

It is a very general opinion among the more learned, that oracles were all mere cheats and impoſtures; either calculated to ſerve the avaricious ends of the heathen prieſts, or the political views of the princes.

M. Bayle ſays poſitively, they were mere human artifices, in which the devil had no hand. He was ſtrongly ſupported by Van Dale, and M. Fontenelle, who have written expreſsly on the ſubject.

Father Balthus, a Jeſuit, wrote a treatiſe in defence of the fathers with regard to the origin of oracles; but without denying the impoſture of the prieſts, often blended with the oracles. He maintains the intervention of the devil in ſome predictions, which could not be aſcribed to the cheats of Jeſuits alone. The abbé Banier eſpouſes the ſame ſide of the queſtion, and objects that oracles would not have laſted ſo long, and ſupported themſelves with ſo much ſplendour and reputation, if they had been merely owing to the forgery of the prieſts.

Biſhop Sherlock, in his "Diſcourſes concerning the Uſe and Intent of Prophecy," expreſſes his opinion, that it is impious to diſbelieve the Heathen oracles, and to deny them to have been given out by the devil; to which aſſertion Dr. Middleton, in his "Examination, &c." (Works, vol. iii. p. 186.) replies, that he is guilty of this impiety, and that he thinks himſelf warranted to pronounce from the authority of the beſt and wiſeſt of the Heathens themſelves, and the evidence of plain facts, which are recorded of thoſe oracles, as well as from the nature of the thing itſelf, that they were all mere impoſture, wholly invented and ſupported by human craft; without any ſupernatural aid or interpoſition whatſoever. He alleges, that Cicero, ſpeaking of the Delphic oracle, the moſt revered of any in the Heathen world, declares, "that nothing was become more contemptible, not only in his days, but long before him;" that Demoſthenes, who lived about 300 years earlier, affirmed of the ſame oracle, in a public ſpeech to the people of Athens, that it "was gained to the intereſts of king Philip," an enemy to that city; that the Greek hiſtorians tell us, how, on ſeveral other occaſions, it had been corrupted by money, to ſerve the views of particular perſons and parties, and the propheteſs ſometimes depoſed for bribery, and for lewdneſs; that there were ſome great ſects of philoſophers, who, by principle, diſavowed the authority of all oracles; agreeably to all which Strabo tells us, that divination in general and oracles had been in high credit among the ancients, but in his days were treated with much contempt; laſtly, that Euſebius alſo, the great hiſtorian of the primitive church, declares, that there were "600 writers among the Heathens themſelves," who had publicly written againſt the reality of them. Although the primitive fathers conſtantly affirmed them to have been the real effects of a ſupernatural power, and given out by the devil; yet M. de Fontenelle maintains, that, while thoſe fathers preferred that way of combating the authority of the oracles, as the moſt commodious to themſelves, and to the ſtate of the controverſy, between them and the Heathens, yet they believed them at the ſame time to be nothing elſe but the effects of human fraud and contrivance; which he has illuſtrated by the examples of Clemens of Alexandria, Origen, and Euſebius.

Plutarch has a treatiſe on the ceaſing of ſome oracles; and Van Dale, a Dutch phyſician, has a volume to prove they did not ceaſe at the coming of Chriſt; but that many of them ceaſed long before; and that others held till the fall of Paganiſm, under the empire of Theodoſius the Great; when Paganiſm being diſſipated, theſe inſtitutions could no longer ſubſiſt.

Van Dale was anſwered by a German, one Mœbius, profeſſor of theology at Leipſic, in 1685. M. Fontenelle eſpouſed Van Dale's ſyſtem, and improved upon it in his Hiſtory of Oracles; and ſhewed the weakneſs of the argument uſed by many writers in behalf of Chriſtianity, drawn from the ceaſing of oracles.

It was Euſebius who firſt endeavoured to perſuade the Chriſtians, that the coming of Jeſus Chriſt had ſtruck the oracles dumb; though it appears from the laws of Theodoſius, Gratian, and Valentinian, that the oracles were ſtill conſulted as low as the year 358. Cicero ſays, the oracles became dumb, in proportion as people, growing leſs credulous, began to ſuſpect them for cheats.

Plutarch alleges two reaſons for the ceaſing of oracles: the one was Apollo's chagrin; who, it ſeems, took it in dudgeon to be interrogated about ſo many trifles. The other was, that in proportion as the genii, or dæmons, who had the management of the oracles, died, and became extinct, the oracles muſt neceſſarily ceaſe. He adds a third and more natural cauſe for the ceaſing of oracles; *viz.* the forlorn ſtate of Greece, ruined and deſolated by wars. For, hence, the ſmallneſs of the gains let the prieſts ſink into a poverty and contempt too bare to cover the fraud.

That the oracles were ſilenced about or ſoon after the time of our Saviour's advent, may be proved, ſays Dr. Leland, in the firſt volume of his learned work on "The Neceſſity and Advantage of Revelation, &c." from expreſs teſtimonies, not only of Chriſtian, but of Heathen authors. Lucan, who wrote his "Pharſalia" in the reign of Nero, ſcarcely 30 years after our Lord's crucifixion, laments it as one of the greateſt misfortunes of that age, that the Delphian oracle, which he repreſents as one of the choiceſt gifts of the gods, was become ſilent.

"————————Non ullo ſæcula dono
Noſtra carent majore Deûm, quam Delphica Sedes
Quod ſileat." Pharſal. l. v. v. 111.

In like manner Juvenal ſays,

" ——————Delphis oracula ceſſant,
Et genus humanum damnat caligo futuri."
Sat. vi. v. 544.

Lucian ſays, that when he was at Delphi, the oracle gave no anſwer, nor was the prieſteſs inſpired. See his Phalaris. Oper. tom. i. This likewiſe appears from Plutarch's treatiſe, why the oracles ceaſe to give anſwers, already cited; whence it is alſo manifeſt, that the moſt learned Heathens were very much at a loſs how to give a tolerable account of it. Porphyry, in a paſſage uſed from him by Euſebius (Præp. Evang. lib. v. c. 1.) ſays, "the city of Rome was overrun with ſickneſs. Æſculapius and the reſt of the gods having withdrawn their converſe with men; becauſe ſince Jeſus began to be worſhipped, no man had received any public help or benefit from the gods."

ORACLES *of the Sibyls*. See SIBYL.

ORAHOVITZKA, in *Geography*, a town of Sclavonia; 16 miles W. of Valpo.

ORAISON, a town of France, in the department of the Lower Alps, on the Durance; 18 miles S.W. of Digne.

ORAL, ſomething delivered by the mouth, or voice. In this ſenſe, we ſay, *oral law*, *oral tradition*, &c.

ORAMANE, in *Geography*, a river of Canada, which runs into the gulf of St. Lawrence, N. lat. 50° 7'. W. long. 61°.

ORAMTCHI-HOTUN, a town of Thibet; 58 miles W.N.W. of Tourfan. N. lat. 44° 2'. E. long. 88° 17'.

ORAN, or WEIRAN, a town of Algiers, and one of the largeſt in the province of Maſcara, ſometimes called Tremecen or Tlemſan, ſituated on the declivity and near the foot of a high mountain, which overlooks it from the N. and N.W. Towards the ſea the city riſes in the form of an amphitheatre, and is ſurrounded with forts and batteries. Cloſe to it lies a ſtrong caſtle, called "Alcazava," in which the Spaniſh governor reſides. It has ſtrong and regular fortifications, and can eaſily be ſupplied by the Spaniards with proviſions and warlike ſtores. On the higheſt hill ſtands Fort St. Croix, whoſe guns command the city and the adjacent country. From this fort they make ſignals of the approach of ſhips, and carefully watch the motions of the Moors, who often attempt predatory excurſions into the neighbouring diſtricts. A deep winding valley ſerves as a trench on the S. ſide, where, likewiſe, at a little diſtance, is a very plentiful ſpring of excellent water. The rivulet formed by this fountain conforms in its courſe to the ſeveral windings of the valley, and paſſing afterwards under the walls of the city, liberally ſupplies it with water. In 1509 this city was taken by the Spaniards, under the command of cardinal Ximenes, then prime miniſter, and continued in their poſſeſſion till the diſturbances occaſioned in Spain by the ſucceeding war in 1708, when the Algerines retook it. But notwithſtanding all their expence and labour for its preſervation, it was recovered by the Spaniards in 1732, and ever ſince they have maintained the uninterrupted poſſeſſion of it, and have adorned it with ſeveral beautiful churches and other edifices. Dr. Shaw found no Roman antiquities in Oran. The Spaniards, however, in their architecture have imitated the Roman ſtyle, and they have carved upon the friezes, and in other convenient places, ſeveral inſcriptions in large characters, and in their own language. In the year 1790 this place was almoſt deſtroyed by an earthquake; the number of perſons who periſhed was eſtimated at more than 2000, including 22 officers, and 304 private ſoldiers belonging to the garriſon. It has a pariſh church, three monaſteries, and a hoſpital; and the number of inhabitants, according to the account given of it by the Spaniards, amounts to 12,000. A conſiderable number of Mahometans take refuge in Oran; they occupy a diſtinct part of the city, receive pay from the court of Spain, and render ſignal ſervices againſt the Moors. The greateſt part of the inhabitants of Oran conſiſts of ſuch as have been baniſhed from Spain; and the ſame may be alſo ſaid, in a great meaſure, of the ſoldiers who compoſe the garriſon. Five regiments are commonly ſtationed here; but on account of continual deſertion, their ſtrength ſcarcely equals that of four complete regiments. One of them wholly conſiſts of malefactors, who have been condemned to remain here for life. The reſt are ſuch as have been tranſported for one or more years. Here is likewiſe a military ſchool. Around the city are pleaſant gardens; but it is very dangerous to cultivate them, on account of the Moors and Arabs, who frequently lie in ambuſh among them. The ſame objection lies againſt the cultivation of the fields in the vicinity; ſo that the garriſon and the inhabitants muſt be ſupplied with proviſions immediately from Spain. N. lat. 35° 35'. W. long. 0° 35'.

ORANAI. See RANAI.

ORANDO *pro Rege & Regno*, an ancient writ. Before the Reformation, while there was no ſtanding collect for a ſitting parliament, when the houſes of parliament were met, they petitioned the king that he would require the biſhops and clergy to pray for the peace and good government of the realm, and for a continuance of the good underſtanding between his majeſty and the eſtates of the kingdom; and accordingly the writ *de orando pro rege & regno* was iſſued, which was common in the time of king Edward III.

ORANG's KEY, in *Geography*, one of the Bahama iſlands. N. lat. 24° 29'. W. long. 79° 35'.

ORANGABAD, a town of Hindooſtan, in the ſubah of Agra; 15 miles N. of Fattipour.

ORANGE-TREE, *Aurantium*, in *Botany*, *Gardening*, and the *Materia Medica*. See CITRUS.

Oranges are ordinarily preſerved in halves and quarters. They are firſt peeled, then ſcooped, and dried in a ſtove. Orangeal is the orange-peel cut in pieces, and candied. Italy furniſhes a great deal of flower of oranges, either dry or liquid.

ORANGE, *Sea*, in *Natural Hiſtory*, a name given by count Marſigli to a very remarkable ſpecies of marine ſubſtance, which he calls a plant. This is the ALCYONIUM *Lyncurium* of the Linnæan ſyſtem; which ſee. It is tough and firm in its ſtructure, and in many things reſembles the common fucus; but inſtead of growing into the branched form the generality of thoſe ſubſtances have, it is round and hollow, and in all reſpects reſembles the ſhape of an orange. It has, by way of root, certain very fine filaments, which faſten themſelves to the rocks, or to ſhells, ſtone, or any thing elſe that comes in the way. From theſe there grows no pedicle, but the body of the orange, as it is called, is faſtened by them to the rock, or other ſolid ſubſtances. The orange itſelf is uſually of about three or four inches in diameter; and while in the ſea, is full of water, and retains this when taken up. In this ſtate it frequently weighs a pound and a half, but when the water is let out, and it is dried, it becomes a mere membrane, weighing ſcarcely any thing. It is beſt preſerved, by ſtuffing it full of cotton, as ſoon as the water is let out of it, and hanging it up to dry in this form. Its ſurface is irregular and rough, and its colour a duſky green on the outſide, and a clearer, but ſomewhat blueiſh-green within; and its thickneſs about an eighth part of an inch. When viewed by the microſcope, it is ſeen to be all over covered with ſmall glandules, or, indeed, compoſed of them;

them; for they ſtand ſo thick, one by another, as to leave no ſpace between, and ſeem to make up the whole ſubſtance; ſo that it appears very like the rough ſhagreen ſkin uſed to cover toys. Theſe are all ſo many hollow ducts, through which the ſea-water finds a paſſage into the globe formed by this ſkin, and by this means it is kept always full and diſtended; on cutting it with a pair of ſciſſars, the water immediately runs out, and the ſkins collapſe; but there is ſomething farther remarkable, which is, that the whole ſubſtance, near the wounded place, is in motion, and ſeems as if alive, and ſenſible of the wound. The glandules are found full of water, and reſembling ſmall tranſparent bottles; and what goes to the ſtructure of the ſubſtance beſide theſe, is an aſſemblage of a vaſt number of filaments, all which are alſo hollow, and filled with a clear and tranſparent fluid.

There is another ſubſtance of this kind, deſcribed by count Marſigli, Triumfetti, and others, and called the *ramoſe*, or branched orange. This is very much of the nature of the former; but, inſtead of conſiſting of one round globule, it is formed of ſeveral oblong ones, all joined ſo together, that they repreſent the branches of ſome of the fucuſes, but that they are ſhorter; and theſe are all hollow and full of water, in the ſame manner as the ſingle globes of the common kind. This has, by way of root, certain fine and ſlender filaments, which faſten it to the ſtones or ſhells near which it is produced; and it is of a duſky greeniſh colour on the ſurface, and of a fine blueiſh-green within. The ſurface, viewed by the microſcope, appears rough, as in the other, and the glandules are of the ſame kind, and are always found full of clear water. Marſigli, Hiſt. de la Mer, p. 81. See CORALLINES.

ORANGE-*Colour*, is a hue or die that partakes equally of red and yellow; or is a medium between the two.

In heraldry, the term *orange* or *orenge* is given in blazon to all roundles that are tenne or tawny.

ORANGE-*Dew*, a ſort of dew which falls in the ſpring-time from the leaves of orange and lemon-trees, and is extremely fine and ſubtile. M. De La Hire obſerving this, placed ſome flat pieces of glaſs under the leaves to receive it, and having thus procured ſome large drops of it, was deſirous of finding out what it was. He ſoon found that it was not a merely aqueous fluid, becauſe it did not evaporate in the air; and that it was not a reſin, becauſe it readily and perfectly mixed with water: it was natural here to ſuppoſe it a liquid gum; but neither did this, on examination, prove to be the caſe; for being laid on paper, it did not dry as the other liquid gums do. Its anſwering to none of theſe characters, and its being of the conſiſtence of honey, and of a ſweet ſugar-like taſte, gave a ſuſpicion of its being a kind of manna; and whatever in the other trials had proved it not a reſin, a gum, &c. all equally tends to prove that it is this ſubſtance.

ORANGE-*flower-Water*. See WATER.

ORANGE-*Lake*. See LAKE.

ORANGE, *Mock*. See PHILADELPHUS.

ORANGE, in *Geography*, a bay on the N.E. coaſt of Jamaica; and alſo a bay at the N.W. end of the ſame iſland, in which is a ſmall iſland, called "Orange-key, or Cay."—Alſo, a bay on the E. coaſt of Newfoundland. N. lat. 50° 32′. W. long. 56° 10′.—Alſo, a cape, the E. point of Oyapok river, S.E. of Cayenne iſland. N. lat. 4° 20′. W. long. 50° 50′.

ORANGE, a county of Vermont in America, containing 20 townſhips and 18,238 inhabitants. The county-town is Newbury, and the townſhips S. of it are Bradford, Fairlee, and Thetford. The land is high and furniſhes numerous ſtreams in oppoſite directions, both to Connecticut river and to lake Champlain.—Alſo, a townſhip on the N. line of the above county, in the N.E. corner of which is Knox's mountain, containing 338 inhabitants.—Alſo, a townſhip, formerly "Cardigan," in Grafton county, New Hampſhire, which gives riſe to an E. branch of Maſcomy river; incorporated in 1789 and containing 203 inhabitants; 20 miles E. of Dartmouth college.—Alſo, a townſhip of Maſſachuſetts, on the E. line of Hampſhire county, on Miller's river, 75 miles N.W. by W. of Boſton; incorporated in 1783, and containing 766 inhabitants.—Alſo, a mountainous and hilly county of New York, divided into 9 townſhips, the chief of which is Goſhen; containing 29,355 inhabitants, of whom 1145 are ſlaves. The excellent butter of this county is collected at Newburgh and New Windſor, and thence tranſported to New York. On the N. ſide of the mountains in this county is a very valuable tract called the "Drowned Lands," and containing about 40 or 50,000 acres.—Alſo, a town called "Orangedale," in Eſſex county, New Jerſey, containing about 80 houſes, a Preſbyterian church, and a flouriſhing academy, and lying N.W. of Newark, which adjoins to it.—Alſo, a county of Hillſborough diſtrict, North Carolina; containing 15,657 inhabitants, of whom 3327 are ſlaves. The chief town is Hillſborough.—Alſo, a county of South Carolina, in Orangeburg diſtrict.—Alſo, a county of Virginia, containing 6207 free inhabitants, and 5242 ſlaves: this county is 55 miles long and 10 broad, and comprehends 320,000 acres. It has been ſo long under culture with tobacco and Indian corn, that the ſoil is greatly impoveriſhed. It has three epiſcopal churches, five or ſix Baptiſt churches, and one belonging to the Preſbyterians; 127 miles from Waſhington.—Alſo, a town of France, and principal place of a diſtrict, in the department of Vaucluſe; before the revolution the capital of a principality and the ſee of a biſhop. The town contains 7270, and its two cantons 18,493 inhabitants, on a territory of 287½ kiliometres, in 10 communes. Among other remains of Roman antiquities in this place are a fine triumphal arch, and an amphitheatre. The principality extends about 10 miles in length and 7 in breadth; and the annual revenue was about 50,000 livres. In the 11th century it had courts of its own, and ſoon acquired the title of a principality. The ſovereignty was in the year 1598 conferred to the houſe of Naſſau by the treaty of Vervins, in 1678 by that of Nimeguen, and in 1697 by that of Ryſwick. William Henry, prince of Orange, was ſtadtholder of Holland in 1672, and in 1689 king of England. After his death, the moſt powerful of the kings who laid claim to it was the king of Pruſſia; but in 1712, king Frederick William, by the treaty of Utrecht, ceded it to the houſe of Bourbon. At the cloſe of the year 1714, it was annexed to the government of Dauphiny, the generality and intendancy of Grenoble and Montelimart. In 1722, Louis XV. gave it to the prince of Conti. It contained one city, two ſmall towns, and about nine villages, and was exempted from all the uſual taxes in France. N. lat. 44° 8′. E. long. 4° 53′.

ORANGE *River*, a river of Jamaica, which runs into the ſea, 4 miles E. of Montego bay.—Alſo, a river of Africa, which riſes in a mountain in the eaſtern part of the ſettlement of the Cape of Good Hope, about 150 miles from the Indian ſea, and after a weſterly courſe of about 600 miles runs into the Atlantic, S. lat 28° 30′.

ORANGE-*Town*, or *Greenland*, a plantation in Cumberland county, and ſtate of Maine in America, N.W. of Waterford. This is a mountainous country; ſome of its mountains having precipices 200 feet perpendicular. The ſides

of

of the mountains and the vallies are fertile, producing good crops, and, in ſome inſtances, affording wild onions, which reſemble thoſe that are cultivated. Winter rye, which is the chief produce, has amounted to twenty buſhels on an acre. The neighbouring country formerly abounded with variety of game, ſuch as mooſe deer, bears, beavers, racoons, ſables, &c. but ſince it has been inhabited game is become ſcarce.

ORANGE-*Town*, or *Tappan*, a townſhip in Orange county, New York, ſituated on the W. ſide of the Tappan ſea, oppoſite to Philipſburg, and about 27 miles N. of New York city. This townſhip is bounded E. by Hudſon river, and S. by the ſtate of New Jerſey. It contained, in 1790, 1175 free inhabitants, and 203 ſlaves.

ORANGE-*Town*, a town of Waſhington county, in the ſtate of Maine; 19 miles from Machias.

ORANGEADE, a drink made of orange-juice, water, and ſugar.

Lemery ſays it may be given to people in the height of a fever.

ORANGEBURG, in *Geography*, a diſtrict of South Carolina, bounded S.W. by Ediſto river: it is divided into three counties, *viz.* Lewiſburg, Orange, and Lexington. In its interior are extenſive foreſts of pine. It is watered by the N. and S. branches of Ediſto river, and contains 13,766 inhabitants, of whom 5356 are ſlaves.—Alſo, a poſt-town of South Carolina, and capital of the above diſtrict, on the E. ſide of the N. branch of Ediſto river: containing a court-houſe, gaol, and about 20 houſes; 77 miles N.N.W. of Charleſton.

ORANGERY, a gallery in a garden, or parterre, expoſed to the ſouth, but well cloſed with a glaſs window, to preſerve oranges in during the winter ſeaſon.

The orangery of Verſailles is the moſt magnificent that ever was built: it has wings, and is decorated with a Tuſcan order.

ORANGERY is alſo uſed for the parterre, where the oranges are expoſed in kindly weather.

ORANG-OUTANG, in *Zoology*, the *Homo ſylveſtris* of Edwards, *Simia ſatyrus* of Linnæus. (See SIMIA. See alſo MAN.) Theſe animals will attack and kill the negroes who wander in the woods; drive away the elephants, beating them with their fiſts or with clubs; and throw ſtones at people who offend them; they ſleep in trees, and ſhelter themſelves from the inclemency of the weather; their appearance is grave, and their diſpoſition melancholy; they are very ſwift, walk erect, and can only be taken alive, and tamed when they are young; in which caſe they are very docile. M. Buffon relates, that he had ſeen this animal offer his hand to thoſe who came to ſee him, and walk with them, as if he had been one of the company; that he has ſeen him ſit at table, unfold his napkin, wipe his lips, make uſe of his knife and fork, pour out his drink into a glaſs, take his cup and ſaucer, put in ſugar, pour out the tea, and ſtir it, in order to let it cool; and that he has done this not only at the command of his maſter, but often without bidding. He did no kind of miſchief, and offered himſelf to be careſſed by ſtrangers. The food which he preferred to every other was dried ripe fruit. A traveller relates, that he has ſeen a female of this ſpecies at Java, who every morning regularly made its own bed; at night lay down with the head on the bolſter, and covered itſelf with the quilt. When its head ached, it wrapped a handkerchief round it. Hoppius, in his Anthropomorpha, 1760, takes great pains to prove, that the orang-outang is incapable, from the extreme dilatation of the pupil, of ſeeing in the day time. Dr. Camper, late profeſſor of aſtronomy, &c. in the univerſity of Groningen, having diſſected the whole organ of voice in the orang, in apes, and ſeveral monkies, concludes, that orangs and apes are not made to modulate the voice like men; for the air paſſing by the *rima glottidis* is immediately loſt in the ventricles or ventricle of the neck, as in apes and monkies, and muſt, conſequently, return from thence without any force and melody within the throat and mouth of theſe creatures; and this ſeems to be the moſt evident proof of the incapacity of orangs, apes, and monkies, to utter any modulated voice, as indeed they have never been obſerved to do. Phil. Tranſ. vol. lxix. part i. art. 14. where the reader may find an account of the diſſection of the organs of ſpeech of the orang-outang, illuſtrated by figures. See *Anatomy of* MAMMALIA.

This animal, ſome have ſuppoſed, is the prototype of all the fauns, ſatyrs, pans, and ſileni, deſcribed by the ancient poets, and whoſe forms are come down to us in the works of the painters, and ſculptors of antiquity; varied and embelliſhed according to the fancy of the authors. They ſeem to have been more numerous formerly than at preſent, if we credit the account of the large troop, to whom Alexander, when in India, prepared to give battle; and the attack made by Hanno on another large body, in an iſland on the coaſt of Africa, where he took three of the females, whoſe ſkins were depoſited in the temple of Juno, and found there by the Romans at the taking of Carthage. Vide Strab. lib. xv. and Hannonis Periplum, p. 77. ed. Hagæ, 1674.

Mr. Pennant apprehends, that the ſatyrs of the ancients were a ſpecies of monkey, and not the ſame with this animal; becauſe Ælian and Ptolemy affirm, that they had tails. See SIMIA aud CHIMPANZEE.

ORANIENBAUM, in *Geography*, a town of Germany, in the duchy of Anhault-Deſſau; 6 miles S.E. of Deſſau. N. lat. 51° 48′. E. long. 12° 28′.—Alſo, a town of Ruſſia, in the gulf of Finland, where is a royal palace, built by prince Menzikoff, afterwards converted into an hoſpital; but much uſed as a reſidence by the emperor Peter III.; 20 miles W. of Peterſburg. N. lat. 59° 52′. E. long. 29° 26′.

ORANIENBURG, a town of Brandenburg, in the Middle Mark, anciently called "Boetzow," ſituated on the Havel, and containing two churches. In 1699, a colony of the Vaudois, driven by perſecution on account of religion from their own country, was eſtabliſhed here. In 1671 the place was deſtroyed by fire; 18 miles N. of Berlin. N. lat. 52° 45′. E. long. 13° 19′.

ORANMORE, a poſt-town of Ireland, in the county of Galway; 98 miles W. by S. from Dublin, and 5 miles E. from Galway.

ORANSAY. See COLONSAY, and ORONSAY.

ORARIUM, in *Eccleſiaſtical Writers*, the ſame with *brandeum*.

ORARNE, in *Geography*, a ſmall iſland on the W. ſide of the gulf of Bothnia. N. lat. 60° 42′. E. long. 17° 7′.

ORATAVA, a ſea-port town on the W. ſide of the iſland of Teneriffe, and the chief place of trade; the harbour of which is rendered unſafe by a N.W. wind: it contains one church and ſeveral convents; 5 miles N. of Laguna.

ORATION, a ſpeech or harangue, framed according to the rules of oratory, and ſpoken in public.

All the kinds of orations may be reduced to three heads; *viz. demonſtrative*, *deliberative*, and *judicial*. Ariſtotle is ſaid to be the author of this diviſion, which ſeems to be very juſt; ſince, perhaps, there is no ſubject of oratory, whether ſacred or civil, that may not be referred to one or other of theſe heads. It is a diviſion which runs through all the ancient

cient treatiſes on rhetoric, and is followed by the moderns who copy them. Dr. Blair, however, though upon the whole he approves and commends this diviſion, ſomewhat deviates from it; and prefers following that diviſion which the train of modern ſpeaking naturally points out to us, taken from the three great ſcenes of eloquence, popular aſſemblies, the bar, and the pulpit, each of which has a diſtinct character that particularly ſuits it. This diviſion coincides in part with the ancient one. The eloquence of the bar is preciſely the ſame with what the ancients called the judicial. The eloquence of popular aſſemblies, (for which ſee PUBLIC SPEAKING,) conſiſts moſtly of what the ancients term the deliberative ſpecies, and yet admits alſo of the demonſtrative. The eloquence of the pulpit (for which ſee PULPIT and ELOCUTION) is altogether of a diſtinct nature, and cannot be properly comprehended under any of the heads of the ancient rhetoricians. Adhering, however, to the ancient diſtribution, we obſerve that to the demonſtrative kind belong all ſuch diſcourſes as relate to the praiſe or diſpraiſe of perſons or things, as *panegyrics*, *invectives*, *genethliaca*, *epithalamia*, *epicedia*, *euchariſtiæ*, *epinicia*, *congratulations*, and *funeral orations*. See DEMONSTRATIVE.

To the deliberative kind belong whatever may become a ſubject of debate, conſultation, or advice, by means of *perſuaſion*, *diſſuaſion*, *exhortation*, and *commendation*. See DELIBERATIVE.

To the judicial kind belong all ſubjects which pertain to the ſecurity of property, the protection of innocence, the maintenance of juſtice, and puniſhment of crimes, by *accuſation*, *confirmation* *confutation*, &c. See each under its proper article, CONFIRMATION, &c.

The judicial is the ſame with the eloquence of the bar employed in addreſſing judges, who have power to abſolve or condemn. In judicial affairs, both the Grecian and Roman youth who were deſirous to gain a reputation for eloquence, uſed commonly to give the firſt proofs of their genius and ability. The firſt of Cicero's orations now extant is his defence of Publius Quintius, which he ſpoke in the 26th year of his age. It was, indeed, at the bar that young orators uſed firſt to exerciſe and try their genius in public; and they took care to prepare themſelves for this, by declaiming beforehand, either in the ſchools, or under the inſtruction of ſome ſkilful perſon in private. In judicial controverſies there are two parties, the plaintiff or proſecutor, and the defendant or perſon charged. The ſubject is ſomething paſt; and the end propoſed by them Cicero calls "equity," or "right and equity;" the former of which ariſes from the laws of the country, and the latter from reaſon and the nature of things. As cauſes may ariſe from a great variety of things, writers have reduced them to three heads, which they call "States," to one of which all judicial proceedings may be referred. See an account of theſe ſtates, under the article CONTROVERSY.

All judicial cauſes are either *private* or *public*: that is, they relate to the right of particular perſons, and theſe are alſo called *civil* cauſes, as they are converſant about matters of property; or they are thoſe which relate to public juſtice and the government of the ſtate, and theſe are alſo called *criminal*, becauſe by them crimes are proſecuted, whether they be capital or of a leſs heinous nature. The "conjectural" ſtate (ſee CONTROVERSY) comes firſt in the order of inquiry; and when a perſon accuſed denies the fact, three things offer themſelves to the conſideration of the proſecutor: *viz.* Whether he *would* have done it, whether he *could*, and whether he *did* it. Hence ariſe three topics; from the *will*, the *power*, and the *ſigns*, or circumſtances which attended the action. The affections of the mind diſcover the *will*, ſuch as paſſion, an old grudge, a deſire of revenge, a reſentment of an injury, and the like. Under the ſecond head, or the *power* of doing a thing, are comprehended three things, *viz.* the place, the time, and the opportunity. The third head relates to the *ſigns* and circumſtances, which either preceded, accompanied, or followed the commiſſion of the fact. All theſe arguments, taken from conjectures, are called "preſumptions," which, though they do not directly prove that the accuſed perſon committed the fact with which he is charged; yet, when being laid together they appeared very ſtrong, ſentence might ſometimes be given by the Roman law upon them to convict him. Theſe are the topics from which the proſecutor deduces his arguments; and it is the buſineſs of the defendant to invalidate them. Sometimes the defendant not only denies that he did the fact, but charges it upon another. Thus Cicero in his oration for Roſcius, not only defends him from each of theſe three heads, but likewiſe charges the fact upon his accuſers. With regard to the *definitive* ſtate (ſee CONTROVERSY), the heads of argument are much the ſame to both parties. For each of them defines the fact in his own way, and endeavours to refute the other's definition. The third ſtate is that of *quality* (ſee CONTROVERSY), in which the diſpute turns upon the juſtice of an action. And here the defendant does not deny he did the thing with which he is charged, but aſſerts it to be right and equitable, from the circumſtances of the caſes, and the motives which induced him to do it. Sometimes a fact is rather excuſed than defended; by pleading that it was not done deſignedly, or with any ill intent: and this is called *conceſſion*, and includes *apology* and *intreaty*. The former repreſents the matter as the effect of inadvertency, chance, or neceſſity: and the latter is a ſubmiſſive addreſs to the equity and clemency of the court, or party offended, for pardon; as Cicero has done in his oration to Cæſar, in favour of Ligurius.

In the eloquence of the bar, or that which is employed in judicial caſes, the great object is conviction. Here it is not the ſpeaker's buſineſs to perſuade the judges to what is good or uſeful, but to ſhew them what is juſt and true; and of courſe it is chiefly, or ſolely to the underſtanding, that his eloquence is addreſſed. Beſides, ſpeakers at the bar addreſs themſelves to one, or to a few judges, who are perſons generally of age, gravity, and authority of character. And, moreover, the nature and management of the ſubjects which belong to the bar require a very different ſpecies of oratory from that of popular aſſemblies, for an account of which ſee PUBLIC SPEAKING. From the conſiderations here ſuggeſted it appears, that the eloquence of the bar is of a much more limited, more ſober, and chaſtened kind, than that of popular aſſemblies; and for ſimilar reaſons, the judicial orations of Cicero or Demoſthenes are not to be regarded as exact models of the manner of ſpeaking which is adapted to the preſent ſtate of the bar. The nature of the bar anciently, both in Greece and Rome, attained a much nearer approach to popular eloquence than what it now does. Strict law was much leſs an object of attention in ancient judicial orations than it is become among us. Eloquence, much more than juriſprudence, was the ſtudy of thoſe who were to plead cauſes: and, accordingly, Cicero ſays, that three months ſtudy was ſufficient to make any man a complete civilian; nay it was thought, that a perſon might be a good pleader at the bar, who had never ſtudied law at all. Beſides, the civil and criminal judges, both in Greece and Rome, were commonly much more numerous than they are with us, and formed a ſort of popular aſſembly.

ſembly. Thus the renowned tribunal of Areopagus at Athens conſiſted of at leaſt fifty judges. In Rome, the Prætor, who was the proper judge both in civil and criminal cauſes, named for every cauſe of moment, the "Judices ſelecti," as they were called, who were always numerous, and had the office and power of both judge and jury.

It ſhould be duly conſidered, that among us the foundation of a lawyer's reputation and ſucceſs muſt always be laid in a profound knowledge of his own profeſſion. Having laid this foundation by being well acquainted not only with the law in general, but by a knowledge of the cauſe which he is to plead in particular, he ſhould be appriſed, that eloquence in pleading is of the higheſt moment for giving ſupport to a cauſe. There is perhaps no ſcene of public ſpeaking where eloquence is more neceſſary; and the effect of good ſpeaking is always very great. Conſequently, of all the liberal profeſſions, there is not any one that gives fairer play to genius and abilities than that of the advocate. For his encouragement to application and exertion he may conſider, that he is ſure of coming forward according to his merit; for though intereſt and friends may ſet forward a young pleader with advantage at the beginning, they can merely open the field to him. A reputation reſting merely on theſe aſſiſtances will ſoon fall. Spectators obſerve, Judges decide, Parties watch; and to him will the multitude of clients never fail to reſort, who gives the moſt approved ſpecimens of his knowledge, eloquence, and induſtry. It is therefore of peculiar importance, that the eloquence adapted to the bar ſhould be properly underſtood. It is a firſt principle in this kind of eloquence, that both in ſpeaking or in writing law papers, it ſhould be of the calm and temperate kind, and connected with cloſe reaſoning. To thoſe who are beginning to practiſe at the bar, it ſhould be recommended, that they be careful to avoid verboſity, and that they form themſelves to the habit of a ſtrong and a correct ſtyle; which expreſſes the ſame thing better in a few words, than by the accumulation of intricate and endleſs periods. Diſtinctneſs is alſo a capital property in ſpeaking at the bar, and this ſhould be manifeſted, both in ſtating the queſtion, and in the order and arrangement of all the parts of the pleading. The narration of facts at the bar ſhould always be as conciſe as the nature of them will admit. When the pleader comes to refute the arguments employed by his adverſary, he ſhould be upon his guard not to do them injuſtice, by diſguiſing them, or placing them in a falſe light. The deceit is ſoon diſcovered, and will not fail of being expoſed. Whereas accuracy and candour in ſtating the arguments that have been uſed againſt him, before he proceeds to combat them, will create a ſtrong prepoſſeſſion in his favour. Wit may ſometimes be of ſervice at the bar, eſpecially in a lively reply, but a young pleader, who is too apt to be dazzled by it, ſhould take heed, that he does not reſt his ſtrength upon this talent. A proper degree of ardour and vehemence is always of uſe: it will have a good effect upon the cauſe, and induce the confidence of clients, for few of them will be fond of truſting their intereſts in the hands of a cold and unanimated ſpeaker. Nevertheleſs, his earneſtneſs and ſenſibility muſt not betray him into indecorum, and ſink him below that dignity of character, which it is of importance for every one in this profeſſion to ſupport. Above all, it ſhould never be forgotten, that there is no inſtrument of perſuaſion more powerful than an opinion of probity and honour in the perſon who undertakes to perſuade. This opinion of probity and honour muſt therefore be carefully preſerved, both by ſome degree of delicacy in the choice of cauſes, and by the manner of conducting them. Dr. Blair has given an analyſis of Cicero's oration "Pro Cluentio," which he recommends as an excellent example of managing at the bar a complex and intricate cauſe, with order, elegance, and force. Ward's Orat. vol. i. Blair's Lect. vol. ii. See ELOCUTION *of the Bar*.

A regular formal oration, or diſcourſe, for both theſe terms are ſynonimous, conſiſts of the following parts, *viz.* the exordium or introduction, the ſtate and the diviſion of the ſubject, or the propoſition, and enunciation of the ſubject, narration or explication, the reaſoning or arguments, the pathetic part, and the concluſion or peroration. See each under its proper head.

ORATION, *Funeral*. See FUNERAL and DEMONSTRATIVE.

ORATOR, a public ſpeaker, or a perſon who underſtands and practiſes the art of *oratory*; which ſee.

The diſpoſition and character and qualifications of the ſpeaker comprehend that part of oratory, or rather of invention, which Quintilian calls a "propriety of manners." They more eſpecially reſpect the proper means, by which he may conciliate the minds of his hearers, engage their affection, and recommend both himſelf and what he ſays to their good opinion and eſteem. There are four qualities, ſays Dr. Ward, more eſpecially ſuited to the character of an orator, which ſhould always appear in his diſcourſes, in order to render what he ſays acceptable to his hearers; and theſe are *wiſdom*, *integrity*, *benevolence*, and *modeſty*. An orator ſhould likewiſe well conſider the circumſtances of time and place, with the ſentiments and diſpoſitions of thoſe to whom he ſpeaks; which, according to Ariſtotle, may be diſtinguiſhed four ways, as they diſcover themſelves by the ſeveral *affections*, *habits*, *ages*, and *fortunes* of mankind. It is the orator's buſineſs to conſider theſe ſeveral characters and circumſtances of life, with the different bias and mode of thinking, which they give to the mind, that he may ſo conduct himſelf in his behaviour and manner of ſpeaking, as will render him moſt acceptable, and gain him the good eſteem of thoſe to whom he addreſſes his diſcourſe.

A true orator, ſays Dr. Blair, ſhould be a perſon of generous ſentiments, of warm feelings, and of a mind turned towards the admiration of all thoſe great and high objects, which mankind are naturally formed to admire. Joined with the manly virtues, he ſhould, at the ſame time, poſſeſs ſtrong and tender ſenſibility to all the injuries, diſtreſſes, and ſorrows of his fellow-creatures; a heart that can eaſily relent; that can readily enter into the circumſtances of others, and can make their caſe his own. A proper mixture of courage, and of modeſty, muſt alſo be ſtudied by every public ſpeaker. Modeſty is eſſential; it is always, and juſtly, ſuppoſed to be a concomitant of merit; and every appearance of it is winning and poſſeſſing. But modeſty ought not to run into exceſſive timidity. Every public ſpeaker ſhould be able to reſt ſomewhat on himſelf; and to aſſume that air, not of ſelf-complacency, but of firmneſs, which beſpeaks a conſciouſneſs of his being thoroughly perſuaded of the truth, or juſtice, of what he delivers; a circumſtance of no ſmall conſequence for making impreſſions on thoſe who hear. Next to moral qualifications, a fund of knowledge is moſt neceſſary to an orator. This is much inculcated both by Cicero and Quinctilian; "Quod omnibus diſciplinis et artibus debet eſſe inſtructus orator:" thus intimating that he ſhould have a liberal education, and be formed for his office by a regular ſtudy of philoſophy and the polite arts. Good ſenſe and knowledge are, indeed, the foundation of good ſpeaking. He who is to plead at the bar muſt make himſelf thoroughly maſter of the know-

ledge of the law; of all the learning and experience that can be uſeful in his profeſſion, for ſupporting a cauſe or convincing a judge. He, who is to ſpeak from the pulpit, muſt apply himſelf cloſely to the ſtudy of divinity, of practical religion, of morals, of human nature; that he may be rich in all the topics, both of inſtruction and perſuaſion. He who would fit himſelf for being a member of the ſupreme council of the nation, or of any public aſſembly, muſt be thoroughly acquainted with the buſineſs that belongs to ſuch aſſembly; he muſt ſtudy the forms of court, the courſe of procedure; and muſt attend minutely to all the facts that may be the ſubjects of queſtion or deliberation. But, beſides the knowledge immediately belonging to his profeſſion, a public ſpeaker ſhould extend his acquaintance with the general circle of polite literature. Moreover, without a habit of application and induſtry, it is impoſſible to excel in any thing; and much leſs to be a diſtinguiſhed pleader, or preacher, or ſpeaker in any aſſembly. Nothing can conduce ſo much to excite this kind of application as the honourable enthuſiaſm, or ardent attachment to the art in which excellence is ſought for, which characteriſed the great men of antiquity. Another circumſtance, that will greatly contribute to improvement, is attention to the beſt models; an attention very different from that ſlaviſh imitation, which depreſſes genius, or betrays the want of it; an attention, which will ſerve to correct and enlarge our own ſtock of ideas, and which will excite a laudable emulation to be diſtinguiſhed in ſtyle, compoſition, and delivery. It ſhould be remembered, while we are endeavouring to profit by models of eloquence, that the ſtyle of writing and that of ſpeaking are different, and that the ſtyle of approved authors in writing diſcourſes ſhould not be transferred to popular orations. Among authors, whoſe manner of writing approaches nearer to the ſtyle of ſpeaking than others, Dr. Blair mentions dean Swift, and lord Bolingbroke. Beſides attention to the beſt models, thoſe, who aſpire to be diſtinguiſhed orators, muſt accuſtom themſelves to the exerciſe both of compoſing and ſpeaking, as a neceſſary means of improvement. To all that has been already ſaid on the beſt method of forming an accompliſhed orator, Dr. Blair directs the candidate for fame in this way to the ſtudy of critical and rhetorical writers, which will ſerve to aid his improvement in the practice of eloquence. He particularly recommends the original ancient writers. Ariſtotle, he ſays, by his comprehenſive genius laid a foundation for all that was afterwards written on the ſubject; and he was the firſt who took rhetoric out of the hands of the Sophiſts, and introduced reaſoning and good ſenſe into the art. His "Treatiſe on Rhetoric" deſerves attentive peruſal. Two ſucceeding Greek rhetoricians ſtill remain, though moſt of them are loſt: theſe are Demetrius Phalereus and Dionyſius of Halicarnaſſus; both have written on the conſtruction of ſentences and merit attention; eſpecially Dionyſius, who is a very accurate and judicious critic. It is needleſs, in this connection, to recommend the rhetorical writings of Cicero, and particularly his three books "De Oratore." But of all the ancient writers on the ſubject of oratory the moſt inſtructive and moſt uſeful is Quintilian; whoſe "Inſtitutions" abound with good ſenſe, and diſcover a very high degree of juſt and accurate taſte; whilſt they comprehend almoſt all the principles of good criticiſm. Ward and Blair, ubi ſupra.

ORATORIO, Ital. *Oratoire*, Fr. *Oratorium*, Lat. a ſacred drama in Latin, or any national language, divided into ſcenes, and uſually in three acts or parts, in imitation of theatrical pieces, but always written on ſacred ſubjects, taken from ſcripture, or church hiſtory, and ſet to a grave and ſolemn muſic, in order to be performed vocally, and inſtrumentally, in a church, or elſewhere, during Lent. This cuſtom, ſays Rouſſeau, is inadmiſſible in France. French muſic is ſo undramatical, that it is enough to be allowed to expoſe itſelf in the theatres, without exhibiting its defects in the church. Riſe and Progreſs of the ſacred muſical Drama, or Oratorio.

The firſt rappreſentatione, or exhibition truly dramatic, that was performed in Italy, according to Apoſtolo Zeno, was a ſpiritual comedy, at Padua, 1243, 1244. (Bibl. Ital. p. 487.) Another Repreſentation of the Myſteries of the Paſſion of Chriſt, &c. according to Muratori, was performed at Friuli, 1298. (Script. Rer. Ital. vol. xxiv. p. 1205.) In 1264, was inſtituted at Rome the Compagnia del Gonfalone, the ſtatutes of which were printed in that city 1554, and of which the principal employment was to act or repreſent the ſufferings of our Lord, in Paſſion-week, an inſtitution which was long continued there. See Riccoboni's Reflex. hiſt. et crit. ſur les differens Theatres d'Europe; et Trattato dell' Opera in Muſica del Cavalier Planelli, § i. cap. 1.

According to Villani, Vaſari, Cionacci, and Creſcimbeni, *la rappreſentatione ſacra teatrale* had its beginning in Tuſcany. (See Signorelli's Storia crit. de' Teatri, p. 189.) Tiraboſchi, Storia della Letterat. Ital. tom. v. l. iii. cap. 3. claims the origin and invention of every ſpecies of drama for the Italians. However, the ingenious and agreeable author of the Biog. Dramatica, or Companion to the Playhouſe, (Introd. p. 9.) obſerves, that "thoſe who imagine the Engliſh to have been later in the cultivation of the drama than their neighbours, will, perhaps, wonder to hear of theatrical entertainments almoſt as early as the Conqueſt; and yet nothing is more certain, if we may believe an honeſt monk, one William Stephanides, or Fitz Stephen, in his Deſcriptio Nobiliſſimæ Civitatis Londinæ, who writes thus: London, inſtead of common interludes belonging to the theatre, has plays of a more holy ſubject: repreſentations of thoſe miracles which the confeſſors wrought, or of the ſufferings, wherein the glorious conſtancy of the martyrs appeared. This author was a monk of Canterbury, who wrote in the reign of Henry II. and died in that of Richard I. 1191; and as he does not mention theſe repreſentations as novelties to the people, for he is deſcribing all the common diverſions in uſe at that time, we can hardly fix them lower than the Conqueſt; and this, we believe, is an earlier date than any other nation of Europe can produce, for their theatrical repreſentations."

Le Chant Royal was invented in France about 1380; it conſiſted of verſes to the virgins and ſaints, ſung in chorus by troops or companies of pilgrims returning from the holy ſepulchre. Meneſtrier, des Repreſentations en Muſ.

There were myſteries repreſented in Germany 1322. And in the ſame century, 1378, the eccleſiaſtics and ſcholars of St. Paul's ſchool exhibited ſimilar interludes in England.

But though every nation in Europe ſeems, in the firſt attempts at dramatic exhibitions, to have had recourſe to religious ſubjects, and an oratorio, or ſacred drama, is but a myſtery or morality in muſic, yet thoſe that were written before the ſeventeenth century ſeem never to have been entirely ſung; but chiefly declaimed, with incidental airs and choruſes. The late Rev. and learned Mr. Crofts, and the honourable Topham Beauclerc, in their curious libraries had collected a great number of theſe religious poems or myſteries, in Italian, of which we procured many of the moſt ancient, at the ſale of their books, in order to trace the origin of the ſacred muſical drama. Some of them, by the groſs manner in which the ſubjects are treated, the coarſeneſs

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of the dialogue, and ridiculous ſituation into which the moſt ſacred perſons and things are thrown, ſeem, though printed ſoon after the invention of the preſs, to be much more ancient than that diſcovery.

Gio Battiſta Doni (Trattato della Muſica Scenica, c. vi. p. 15. Op. omn. tom. ii. S. Giovanni e Paolo, one of the Collect. was written by Lorenzo il Magnifico: Santa Domitilla, and Santa Guglielma, by Antonia, wife of the poet Pulci, in the fifteenth century), ſpeaking of oratorios, ſays that by a *ſpiritual repreſentation* he does not mean that groſs, vulgar, and legendary kind of drama uſed by the nuns and monks in convents, which deſerve not the name of poetry; but ſuch elegant and well conſtructed poetical fables as that of St. Alexis, by the ingenious Giulio Roſpigliofi, many times repreſented, and always received with great applauſe. This oratorio, which is omitted in the Drammaturgia, though printed in ſcore, in folio, 1634, was ſet to muſic by Stefano Landi, of the Papal chapel, and performed at the Barberini palace in Rome, on a ſtage, and in action, with dances, machinery, and every kind of dramatic decoration, of which a ſplendid account is given in a preface and letter prefixed to the work.

This deſcription ſeems to comprehend the poetical virtues and vices of all ancient and modern religious dramas. The abbé Arnaud, in his Eſſai ſur le Theatre Anglois, (Varietées Litt. tom. i. p. 29.), ſays that the fathers of the church in the firſt ages of Chriſtianity, indulging the paſſion of the people for public ſpectacles, oppoſed religious dramas, built on the ſacred writings, to the profane, which had been long uſed by the Pagans.

At the revival of theatrical amuſements, when the reformers began to diſſeminate their doctrines throughout Europe, religious plays were made the vehicles of opinion, both by the Catholics and Proteſtants; and there are Latin dramas of this kind, as well as others in modern languages, extant, which might with propriety be called oratorios. At the beginning of the Reformation in England, it was ſo common for the defenders of the old and new doctrines to avail themſelves of plays compoſed on ſubjects of ſcripture, in which they mutually cenſured and anathematiſed each other, that an act of parliament paſſed in the twenty-fourth year of Henry VIII. to prohibit the acting or ſinging any thing in theſe interludes contrary to the eſtabliſhed religion. It appears, however, in Collyer's Hiſtory of the Reformation, that after this period, the myſteries of the Roman Catholic religion were ridiculed by the Proteſtants, on a ſtage, in churches. It is related by Cardan, in his eloge of our young king, Edward VI., that he had written a moſt elegant comedy, called The Whore of Babylon. The number of comedies, and tragi-comedies, written about this time, is incredible; they are, however, ſaid to have been even more extravagant and groſs, than numerous. One is entitled, Jeſus the true Meſſiah, a comedy; another, The new German Aſs of Balaam; the Calviniſtical Poſtilion; the Chriſtian Cavalier of Eiſlebn, a delectable, ſpiritual comedy, including the hiſtory of Luther and his two greateſt enemies, the pope and Calvin; A pleaſant comedy of the true old Catholic and Apoſtolic church, &c. Storia Crit. de' Teatri, p. 248.

The Converſion of St. Paul, performed at Rome, 1440, as deſcribed by Sulpicius, has been, erroneouſly, called the *firſt* opera, or muſical drama. (Hiſt. de la Muſ. tom. i. p. 241. and Meneſtrier, ſur les Repreſ. en Muſ.) Abram et Iſaac ſuo Figliuolo, a ſacred drama (*azione ſacra*) "ſhewing how Abraham was commanded by God to ſacrifice his ſon Iſaac on the mountain," was performed in the church of St. Mary Magdalen in Florence, 1449. Another on the ſame ſubject, called Abraham and Sarah, "containing the good life of their ſon Iſaac, and the bad conduct of Iſhmael, the ſon of his hand-maid, and how they were turned out of the houſe," was printed in 1556. Abel e Caino, and Sampſon, 1554; The Prodigal Son, 1565; and La Commedia Spirituale dell' Anima, "The Spiritual Comedy of the Soul," printed at Siena, but without date; in which there are near thirty perſonifications, beſides St. Paul, St. John Chryſoſtom, two little boys who repeat a kind of prelude, and the announcing angel who always ſpeaks the prologue in theſe old myſteries. He is called *l'angelo che nunzia*, and his figure is almoſt always given in a wooden cut on the title-page of printed copies. Here, among the interlocutors, we have God the Father, Michael the archangel, a Chorus of Angels, the human Soul with her guardian Angel, Memory, Intellect, Free-will, Faith, Hope, Charity, Reaſon, Prudence, Temperance, Fortitude, Juſtice, Mercy, Poverty, Patience, and Humility: with Hatred, Infidelity, Deſpair, Senſuality, a Chorus of Dæmons, and the Devil.

None of theſe myſteries are totally without muſic, as there are choruſes and *laudi*, or hymns, that are ſung in them all, and ſometimes there was playing on inſtruments between the acts. In a play written by Damiano and printed at Siena, 1519, according to Creſcimbeni, tom. i. p. 107, at the beginning of every act there was an octave ſtanza, which was ſung to the ſound of the lyra viol, by a perſonage called Orpheus, who was ſolely retained for that purpoſe; at other times a madrigal was ſung between the acts, after the manner of a chorus.

It was, however, by ſmall degrees that entire muſical myſteries had admiſſion into the church, or were improved into oratorios. All the Italian writers on the ſubject agree, that theſe ſacred muſical dramas had their beginning in the time of San Filippo Neri, who was born 1515, and founded the congregation of the Prieſts of the Oratory at Rome, in 1540. This ſaint, who died 1595, is numbered among Italian improviſatori, by Quadrio, tom. i. p. 163. He was originally intended for a merchant, but was drawn from commercial purſuits by Vocation. *Oratorio*, Ital. *Oratorium*, Lat. implies a ſmall chapel, or particular part of a houſe or church, where there is an altar. The ſpaces between the arches of Romiſh churches, are called *Oratorii*, Ital. *Oratoires*, Fr. Anglicè chapels. The Congregation of the Oratory, eſtabliſhed at Rome, and in ſome other cities of Italy by S. Phil. Neri, about 1558, originated from the conferences which this pious eccleſiaſtic held in his own chamber at Rome. The great number of perſons who attended theſe meetings obliged St. Phil. to requeſt the adminiſtrators of the church of San Girolamo della Carità to grant permiſſion to hold theſe aſſemblies there, which was granted. In 1574, they were transferred to the church of the Florentines; and in 1583 to Santa Maria della Vallicella. By degrees this eſtabliſhment ſpread itſelf all over Italy, where it has ſtill many houſes. The members are bound by no vow. Dict. des Cultes Relig.

It appears that theſe fathers, in whatever city of Italy they had an eſtabliſhment, entertained their congregations with good muſic. During the ſervice, and after ſermon, it was uſual for them, among other pious exerciſes, in order to draw youth to church, and keep them from ſecular amuſements, to have hymns, pſalms, and other ſpiritual *laudi*, or ſongs, ſung either in chorus, or by a ſingle favourite voice, divided into two parts, the one performed before the ſermon, and the other after it.

But though this devout practice was begun in ſo ſimple a manner, with only ſpiritual cantatas, or ſongs, on moral ſubjects; in order to render the ſervice ſtill more attractive,

ſome ſacred ſtory or event from ſcripture was written in verſe, and ſet by the beſt poets or muſicians of the times. Theſe being compoſed in dialogue, and rendered intereſting to the congregation, ſuch curioſity was excited by the performance of the firſt part, that there was no danger during the ſermon that any of the hearers would retire, before they had heard the ſecond.

The ſubjects of theſe pieces were ſometimes the good Samaritan; ſometimes Job and his friends; the prodigal ſon; Tobit with the angel, his father and his wife, &c. All theſe, by the excellence of the compoſition, the band of inſtruments, and the performance, brought this oratory into ſuch repute, that the congregations became daily more and more numerous. And hence this ſpecies of ſacred muſical drama, wherever performed, in proceſs of time, obtained the general appellation of oratorio. In the church of San Girolamo della Carita at Rome, oratorios are ſtill conſtantly performed on Sundays and feſtivals from All Saints Day till Palm Sunday; as well as in the church of La Vallicella, or la Chieſa Nuova, where they are likewiſe performed from the firſt of November till Eaſter; Oratorj in Muſica, e ſermoni, every evening on all feſtivals. (See Roma moderna by Venuti, 1766, p. 207.) Theſe are the two churches in which ſuch ſpiritual ſpectacles had their beginning; but the practice has ſince been ſo much extended to the other churches of Rome, that there is not a day in the year on which one or more of theſe performances may not be heard. And as liſts of oratorios and other *Funzioni* to be performed in the ſeveral churches in the courſe of the year are publiſhed, like our liſts of Lent preachers, great emulation is excited in the directors and performers, as well as curioſity in the public. The firſt collection of the words of hymns and pſalms, ſung in the chapel of San Filippo Neri, was publiſhed at Rome 1585, under the title of Laudi ſpirituali ſtampate ad iſtanza de' R R. P. P. della Congregatione dell' Oratorio. The ſecond in 1603: Laudi Spirituali di diverſi, ſolite cantarſi dopo Sermoni da' P P. della Cong. dell' Oratorio; among theſe were dialogues, in a dramatic form. (Creſcimbeni, Introd. all' Iſtor. della Volg. Poeſia. vol. i. lib. iv. p. 256.) See MYSTERIES and MORALITIES, which were often dramatized and formed into oratorios for convents and churches, and performed on feſtivals.

ORATORY is the art of ſpeaking well, upon any ſubject, in order to perſuade; and to ſpeak well, as Cicero explains it, is to ſpeak juſtly, methodically, floridly, and copiouſly. In which ſenſe the word imports the ſame with *rhetoric*; the difference between the two only conſiſting in this, that one is taken from the Greek language, and the other from the Latin. However, the caſe is not preciſely the ſame with the words *rhetorician* and *orator*. For although the Grecians uſed the former to expreſs both thoſe who taught the art, and ſuch as practiſed it; yet the Romans afterwards, when they adopted that word into their language, confined it to the teachers of the art, and called the reſt *orators*.

Lord Bacon defines rhetoric, or oratory, to be the art of applying and addreſſing the dictates of reaſon to the fancy, and of ſo recommending them as to affect the will and deſires. The end of rhetoric, he obſerves, is to fill the imagination with ideas and images, which may aſſiſt nature, without oppreſſing it.

Voſſius defines rhetoric, the faculty of diſcovering what every ſubject affords of uſe for perſuaſion. Hence, as every author muſt invent arguments to make his ſubjects prevail; diſpoſe thoſe arguments, thus found out, in their proper places; give them the embelliſhments of language proper to the ſubject; and, if this diſcourſe be for public delivery, utter them with that decency and force which may ſtrike the hearer; *rhetoric*, or *oratory*, becomes divided into four parts, *viz. invention, diſpoſition, elocution*, and *pronunciation*; which ſee reſpectively.

As to the hiſtory of oratory, the firſt invention of it is aſcribed by the Egyptians, and fables of the poets, to Mercury. Quinctilian obſerves, with reſpect to the origin of this art, that we derive the faculty of ſpeech from nature; but the art from obſervation; and that men, perceiving that ſome things in diſcourſe are ſaid to advantage, and others not, accordingly marked thoſe things, in order to avoid the one, and imitate the other: and that they alſo added ſome things from their own reaſon and judgment, which being confirmed by uſe, they began to teach others what they knew themſelves. But it is not known when this method of obſervation firſt took place. It is reaſonable to believe, that the Greeks had the principles of this art ſo early as the time of Pittheus, whoſe nephew Theſeus lived not long before the taking of Troy. And at this time Cicero thought it was in much eſteem among them. After this period, there is a great chaſm in the hiſtory of oratory: for Quinctilian ſays, that afterwards Empedocles, who flouriſhed about five hundred years after Troy was taken, is the firſt upon record who attempted any thing concerning it. About this time there aroſe ſeveral maſters of this art, the chief of whom Quinctilian has enumerated; as Corax and Tiſias, of Sicily; Gorgias, of Leontium, in the ſame iſland, the ſcholar of Empedocles; Thraſymachus, of Calcedon; Prodicus, of Cea; Protagoras, of Abdera; Hippias, of Elis; Alcidamus, of Elea; Antiphon, who firſt wrote orations; Polycrates, and Theodore of Byzantium. Nor ſhould we omit Plato, whoſe elegant dialogue, entitled Gorgias, is ſtill extant. To theſe ſucceeded Iſocrates, the moſt renowned of the ſcholars of Gorgias, extolled by Cicero as the greateſt maſter and teacher of oratory; Ariſtotle, whoſe ſyſtem of oratory is eſteemed the beſt and moſt complete of any in the Greek language; Demoſthenes, who was an auditor of Iſocrates, Plato, and Iſæus, and who has been eſteemed by the beſt judges the prince of Grecian orators; Æſchines, who taught rhetoric at Rhodes; Theodectes and Theophraſtus, diſciples of Ariſtotle; Demetrius Phalereus, ſcholar of Theophraſtus; Hermagoras; Athenæus; Apollonius Molon; Areus Cæcilius; Dionyſius, of Halicarnaſſus; Apollonius, of Pergamus; and Theodore of Gadara. Of theſe there now remains nothing upon the ſubject of oratory, except ſome tracts of Dionyſius, who flouriſhed in the reign of Auguſtus Cæſar. After the time of Quinctilian we may mention Hermogenes, and Longinus, the author of the excellent treatiſe "Of the Sublime."

This art was introduced late, and with difficulty among the Romans. In the year of their city 592, when, by the induſtry of ſome Grecians, the liberal arts began to flouriſh in Italy, a decree paſſed the ſenate, by which all philoſophers and rhetoricians were ordered to depart out of Rome: but in a few years after, on the arrival of certain ambaſſadors, *viz.* Carneades, Critolaus, and Diogenes, who were orators as well as philoſophers, from Athens to Rome, the Romans were ſo charmed with the eloquence of their harangues, that they could no longer be reſtrained from purſuing the ſtudy of oratory. According to Seneca, Lucius Plotius, a Gaul, was the firſt who taught the art of oratory, at Rome, in Latin, and the firſt Roman who engaged in it was Blandus, of the equeſtrian order; and he was ſoon ſucceeded by others; ſome of whoſe lives are yet extant, written by Suetonius, as many of the Grecians are by Philoſtratus and Eunapius. The writers on this art, enumerated by Quinctilian, were M. Cato, the cenſor, and after him Anthony, the orator; but he who carried eloquence to its higheſt pitch



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was Cicero, who has likewiſe, by his rules, given the beſt plan, both to practiſe and teach the art. He alſo mentions Cornificius, Stertinius, Gallio the father, Celſus, Lenas, Virginius, Pliny, and Rutilius.

Quinctilian himſelf deſerves the higheſt commendation for diligence and accuracy as a writer; of whom St. Jerom ſays, that he was the firſt who taught publicly at Rome, and received a ſalary from the treaſury. This he places in the eighth year of Domitian; whereas Suetonius informs us, that Veſpaſian was the firſt who granted out of the treaſury a yearly ſalary of near 800*l.* ſterling, to the Latin and Greek rhetoricians. Since the revival of learning, there has been a great number of writers, who have treated on the ſubject of oratory, and contributed to the perfection of it, both in theory and practice.

Having rapidly enumerated the principal orators of antiquity, both in Greece and Rome, we ſhall now mention ſome peculiar circumſtances which contributed at different periods and in different countries to call forth into exerciſe their powers of eloquence, and to give them their celebrity. Eloquence, or oratory, being the art of ſpeaking in ſuch a manner as to attain the end for which we ſpeak, its power will chiefly appear when it is employed to influence conduct, and to perſuade to action; and in this view it may be conciſely defined, "the art of perſuaſion." A popular writer has diſtinguiſhed three kinds, or degrees, of eloquence; for an account of which, ſee ELOQUENCE. It has been obſerved by ſeveral authors, that eloquence is to be looked for only in free ſtates. This obſervation is appropriately and beautifully illuſtrated by Longinus. Liberty, he ſays, is the nurſe of true genius; it animates the ſpirit, and invigorates the hopes of men; excites honourable emulation, and a deſire of excelling in every art. All other qualifications you may find among thoſe who are deprived of liberty; but never did a ſlave become an orator; he can only be a pompous flatterer. Theſe obſervations, under certain limitations, are juſtified by hiſtory and obſervation. For although under arbitrary governments, that are civilized, and that encourage the arts, ornamental eloquence may flouriſh, that eloquence which is calculated more to ſoothe and pleaſe, than to convince and perſuade; yet high, manly, forcible eloquence is to be looked for only, or chiefly, in the regions of freedom. Eloquence, or the art of perſuaſion, took its riſe with that of the Grecian republics. The flouriſhing period of the Grecian ſtates laſted from the battle of Marathon till the time of Alexander the Great, who ſubdued the liberties of Greece. This period comprehends about 150 years, and within it are to be found moſt of their poets and philoſophers, but chiefly their orators. Of theſe Grecian republics the moſt noted for eloquence, as well as for arts of every kind, was that of Athens. The genius of the government of the Athenians was democratical, and affairs were conducted among them by reaſoning and ſpeaking, and by a ſkilful application to the paſſions and intereſts of a popular aſſembly.

In ſuch a ſtate, and among ſuch a people, eloquence, that kind of eloquence which was moſt effectual for convincing, intereſting, and perſuading the hearers, would be much ſtudied, as the ſureſt means of riſing to influence and power. Piſiſtratus, who was contemporary with Solon, and ſubverted his plan of government, is mentioned by Plutarch as the firſt who diſtinguiſhed himſelf among the Athenians by application to the arts of ſpeech; and in this way he roſe to the ſovereign power. Of ſucceeding orators we have no particular account till the commencement of the Peloponneſian war, when Pericles appeared, and carried eloquence to a great height; to ſuch a height that he was never afterwards ſurpaſſed. His eloquence was ſo forcible and vehement, that it triumphed over the paſſions and affections of the people; and he was therefore called Olympius, and is ſaid, like Jupiter, to have thundered when he ſpoke. Suidas mentions one remarkable circumſtance relating to Pericles, that he was the firſt Athenian who compoſed, and put into writing, a diſcourſe deſigned for the public. After Pericles, in the courſe of the Peloponneſian war, aroſe Cleon, Alcibiades, Critias, and Theramenes, eminent citizens of Athens, who, though not orators by profeſſion, were all diſtinguiſhed for their eloquence. The ſtyle of oratory which then prevailed, appears from the orations in the hiſtory of Thucydides, who flouriſhed in the ſame age; it was manly, vehement, and conciſe, approaching even to ſome degree of obſcurity. After the days of Pericles, the reputation and influence which the powers of eloquence acquired, gave birth to a ſet of men, called Rhetoricians, or Sophiſts, who appeared in great number during the Peloponneſian war; ſuch were Protagoras, Prodicus, Thraſymus, and Gorgias. Theſe men profeſſed the art of giving receipts for making all ſorts of orations, for or againſt any cauſe whatever. They were the firſt who, with this view, treated of common places, and the artificial invention of arguments and topics for every ſubject. Accordingly they may be juſtly deemed the firſt corruptors of true eloquence; and they were oppoſed by Socrates, who endeavoured to explode their ſophiſtry. In the ſame age with the philoſopher juſt mentioned, flouriſhed Iſocrates, whoſe writings are ſtill extant. As a profeſſed rhetorician he acquired a great fortune and higher favour than any of his competitors, by teaching eloquence. His orations abound with morality and good ſentiments; they are flowing and ſmooth; but too deſtitute of vigour. For a further account of him, ſee his biographical article. To this period belong alſo Iſæus and Lyſias. (See their articles.) The former is diſtinguiſhed for being the maſter of Demoſthenes, who raiſed eloquence to a higher degree of ſplendour than any other perſon who ever bore the name of an orator. For the circumſtances of his life, and the character of his eloquence, particularly compared with that of Cicero, and contraſted againſt that of Æſchines, ſee his biographical article. After the days of Demoſthenes, Greece loſt her liberty, and eloquence of courſe languiſhed and relapſed again into the feeble manner introduced by the rhetoricians and ſophiſts. Demetrius Phalereus, who lived in the next age to Demoſthenes, attained ſome character, but he is repreſented as a flowery rather than a perſuaſive ſpeaker, who aimed at grace rather than ſubſtance. "He amuſed the Athenians," ſays Cicero, "rather than warmed them." After his time we hear of no more Grecian orators of any note.

If we advert to the riſe and progreſs of eloquence among the Romans, we ſhall find that they were long a martial nation, altogether rude, and unſkilled in arts of any kind. The Romans always acknowledged the Grecians as their maſters in every part of learning. To this purpoſe Horace ſpeaks of them in his Epiſt. ad Aug.

> "When conquer'd Greece brought in her captive arts,
> She triumph'd o'er her ſavage conquerors' hearts;
> Taught our rough verſe its numbers to refine,
> And our rude ſtyle with elegance to ſhine."
>
> Francis.

As the Roman government, during the republic, was of the popular kind, public ſpeaking became at an early period an engine of government, and was employed for gaining diſtinction and power. But in the rude unpoliſhed times of the ſtate, their ſpeaking could hardly be deemed eloquence.

quence. It was not till a ſhort time preceding the age of Cicero, that the Roman orators roſe into any note. Craſſus and Antonius, to whom we may add Hortenſius, appear to have been the moſt eminent. Cicero has deſcribed the character of their eloquence. Cicero himſelf is at this period the object moſt worthy of our attention; and his name alone ſuggeſts every thing that is ſplendid in oratory. For his character as an orator, we refer to his biographical article. The reign of eloquence, among the Romans, was very ſhort. After the age of Cicero, it not only long languiſhed but expired: nor need we wonder that this ſhould be the caſe. For not only was liberty entirely extinguiſhed, but arbitrary power was felt in its heavieſt and moſt oppreſſive weight: Providence having in its wrath delivered over the Roman empire to a ſucceſſion of ſome of the moſt execrable tyrants that ever diſgraced and ſcourged the human race. The change which was produced in eloquence by the nature of the government and the ſtate of the public manners, is beautifully deſcribed in the dialogue "De Cauſis corruptæ Eloquentiæ," attributed by ſome to Tacitus, by others to Quinctilian. In the ſchools of the declaimers, the corruption of eloquence was completed. Thus, with the Greek rhetoricians, the manly and ſenſible eloquence of their firſt noted ſpeakers degenerated into ſubtility and ſophiſtry; and among the Roman declaimers, it paſſed into the quaint and affected; into point and antitheſis. This corrupt manner begins to appear in the writings of Seneca; and ſhews itſelf alſo in the famous panegyric of Pliny the Younger on Trajan, which may be conſidered as the laſt effort of Roman oratory. In the decline of the Roman empire, the introduction of Chriſtianity gave riſe to a new ſpecies of eloquence, in the apologies, ſermons, and paſtoral writings of the fathers of the church. Among the Latin fathers, Lactantius and Minutius Felix are the moſt remarkable for purity of ſtyle; and in a later age, the famous St. Auguſtine poſſeſſes a conſiderable ſhare of ſprightlineſs and ſtrength. But none of the fathers afford any juſt models of eloquence. Among the Greek fathers, the moſt diſtinguiſhed, in a high degree, for his oratorical merit, is St. Chryſoſtom. See his biographical article.

In modern times, and even in Great Britain, we are unqueſtionably inferior, in a variety of reſpects, to the Greeks and Romans. They aſpired to a more ſublime ſpecies of eloquence than the moderns. Theirs was of the vehement and paſſionate kind; that of the moderns is much more cool and temperate; and in our country eſpecially, it has confined itſelf almoſt wholly to the argumentative and rational. The reaſons of this change are detailed by Dr. Blair in his Lectures, &c. vol. ii.

We ſhall cloſe this article with obſerving, in the words of a very good judge, that the method of forming the beſt ſyſtem of oratory is to collect it from the fineſt precepts of Ariſtotle, Cicero, Quinctilian, Longinus, and other celebrated authors; with proper examples taken from the choiceſt parts of the pureſt antiquity. On this plan, the learned Dr. Ward has formed his ſyſtem, to which we refer the reader, and on the ſubject of this article to his firſt lecture, vol. i. Concerning the diſtribution of the ſubject of oratory, and different kinds of orations, ſee ORATION.

ORATORY is alſo uſed, among the Romans, for a cloſet, or little private apartment, in a large houſe, near a bed-chamber, furniſhed with a little altar, and a book-ſtand for private devotion.

The ancient oratories were little chapels, adjoining to monaſteries, wherein the monks ſaid prayers, before they had any churches. Several councils and ſynods have condemned the uſe of private oratories.

In the ſixth and ſeventh centuries, oratories were little churches, frequently built in burial-grounds, without either baptiſtery, cardinal prieſt, or any public office; the biſhop ſending a prieſt to officiate occaſionally.

ORATORY is alſo uſed for a ſociety or congregation of devout perſons, who form a kind of monaſtery, and live in community; but without being obliged to make any vows. Hence,

ORATORY, *Prieſts of the*, a community of ſecular prieſts, who live together in a monaſtic manner, but without vows. They were firſt eſtabliſhed at Rome, about the year 1540, by St. Philip Neri, a Florentine, under the title of "Oratory of Sancta Maria in the Valicella."

The name of this religious ſociety was derived from an apartment, accommodated in the form of an oratory, or cabinet for devotion, which S. Philip Neri built at Florence for himſelf, and in which for many years he held ſpiritual conferences with his more intimate companions.

On the model of this the cardinal Berulle eſtabliſhed a congregation of the Oratory of Jeſus, in 1613, in France, which has ſince increaſed: ſo that there aroſe ſixty houſes of Prieſts of the Oratory, in that kingdom.

The fathers, or Prieſts of the Oratory, are not, properly ſpeaking, religious or monks, being bound by no vows, and their inſtitute being purely eccleſiaſtical or ſacerdotal.

There is ſome difference, however, between the Italian and French inſtitutions. S. Philip Neri, to prevent the confuſion which the great number of houſes uſually occaſioned in congregations, would have his to be a ſingle houſe: and though others were at liberty to form the like congregations, yet they were to have no dependence on one another.

For this reaſon, the houſes of the Oratory, in Italy and Flanders, are all independent; whereas, thoſe in France have a relation to each other, and all depend on the ſame chief, who has the quality of ſuperior-general; and, with three aſſiſtants, governs all the congregations.

ORAVAIS, in *Geography*, a town of Sweden, in Eaſt Bothnia; 22 miles N. of Waſa.

ORAWITZA, a river of Hungary, which runs into the Waag; 9 miles N. of Arva.

ORAYOI, a town of New Mexico; 150 miles W. of Santa Fé.

ORB, ORBIS, in *Aſtronomy*, a ſpherical body or ſpace, contained under two ſuperficies; the one concave the other convex.

The ancient aſtronomers conceived the heavens as conſiſting of ſeveral vaſt azure tranſparent orbs or ſpheres, incloſed in one another; or vaſt circles, which in their areas included the bodies of the planets; the radii of which were compriſed between the centre of the earth, and the higheſt point to which the planets riſe, ſuppoſing the earth to be in the centre.

There are orbs *concentric*, i. e. having the ſame centre; and orbs *eccentric*.

The *magnus orbis*, or great orb, is that in which the ſun is ſuppoſed to revolve; or, rather, it is that in which the earth makes its annual circuit.

ORB, in *Aſtrology*. An orb of light is a certain ſphere, or extent of light, which the aſtrologers allow a planet beyond its centre.

They ſay, that, provided the aſpects do but fall within this orb, they have almoſt the ſame effect as if they pointed directly againſt the centre of the planet. See ASPECT.

The orb of Saturn's light they make to be 10 degrees; that of Jupiter 12 degrees; that of Mars 7 degrees 30 minutes; that of the Sun 17 degrees; that of Venus 8 de-

grees; that of Mercury 7 degrees; that of the Moon 12 degrees 30 minutes.

ORB, in *Pointed Architecture*, the ſame as knot or boſs. See KNOT.

ORB, in *Tactics*. See *Round* BATTALION.

ORB, in *Geography*, a river of France, which riſes in the N. part of the department of the Allier; 8 miles N.W. of Lodeve, and runs into the Mediterranean, 8 miles below Beziers.

ORBE, a river of Switzerland, which riſes in mount Jura, paſſes the lake of Neufchatel and Bienne, and runs into the Aar; 3 miles W. of Buren, in the canton of Berne.—Alſo, a town of Switzerland, in the canton of Berne, ſituated on the above river. According to antiquaries, this was the moſt ancient town, and once the moſt powerful of all Helvetia: it was called "Urba," and was the capital of the "Pagus Urbigenus;" but it has no remains of its ancient ſplendour. Some antique fortifications, an old caſtle, and a round tower, are probably works of later times, when this country was divided into a number of feudal ſovereignties. The ſituation of the town is romantic; its ſingle-arched bridge projecting over the Orbe, the wild ſcenery on the banks of this river, the frequent cataracts, and the picturesque view in the environs, are all intereſting objects. Orbe, which is governed by its own magiſtrates, is compriſed within the bailliage of Echalons, belonging to Berne and Friburgh. In this town is an infirmary, formed by M. Venel, an eminent ſurgeon, for the reception of perſons with diſtorted limbs. Venel has contrived a machine to embrace the patient's limbs when in bed, and which is conſtructed ſo as to act without diſturbing their reſt. This contrivance, it is ſaid, has performed many cures; 5 miles S.W. of Yverdun.—Alſo, a town of Germany, celebrated for its ſalt-works; 26 miles E. of Frankfort on the Maine.

ORBEC, a town of France, in the department of the Calvados, and chief place of a canton, in the diſtrict of Liſieux; 10 miles S.E. of Liſieux. The place contains 3600, and the canton 15,047 inhabitants, on a territory of 180 kiliometres, in 27 communes.

ORBICULAR LEAF, in *Botany*. See LEAF.

ORBICULARIS, in *Anatomy*, an epithet applied to the muſcles which ſurround the openings of ſome organs; as the orbicularis oris or labiorum at the mouth. See DEGLUTITION, and EYE.

ORBICULARIS, in *Botany*, a name given by ſome authors to the artanita, or cyclamen, called in Engliſh ſow-bread. See CYCLAMEN.

ORBICULUS CILIARIS, in *Anatomy*, a circular adheſion between the choroid coat and ſclerotica of the eye. See EYE.

ORBIEU, in *Geography*, a river of France, which riſes in the department of the Eaſtern Pyrenées, and runs into the Aude, 5 miles N.W. of Narbonne.

ORBIGA, a river of Spain, which runs into the Duero, near Zamora, anciently called "Urbicus."

ORBION, a lake of the iſland of Corſica, near the ſea, on the E. coaſt; 27 miles S.E. of Corte.

ORBIS, in *Ichthyology*, a ſpecies of *Chætodon*; which ſee.—Alſo, a name given to ſeveral ſpecies of *Diodon*; which ſee.

ORBIT, ORBITA, in *Aſtronomy*, the path of a planet or comet; or, the line deſcribed by its centre in its proper motion in the heavens.

The ſun's, or rather the earth's orbit, is the curve which it paſſes along in its annual revolution; called the *ecliptic*.

The orbit of the earth, and that of all the primary planets, is an ellipſis, in one of whoſe foci the ſun is placed; in which ellipſis they move according to this law, that a radius drawn from the centre of the ſun to the centre of the planet, always deſcribes areas proportional to the times.

The ancient aſtronomers made the planets deſcribe circular orbits with an uniform velocity; Copernicus himſelf could not believe they ſhould do otherwiſe. "Fieri nequit," ſays he, "ut cœleſte corpus ſimplex uno orbe inæqualiter moveatur." So that, to account for their inequalities, they were obliged to have recourſe to eccentrics and epicycles; from the embarraſſment of which Copernicus could not entirely diſentangle himſelf.

But after him came aſtronomers, who, with a little more phyſics, have made no difficulty of changing theſe circular orbits into elliptical ones: and of making them move with different velocities in different parts of theſe orbits.

Of theſe elliptic orbits, there have been two kinds aſſigned; the firſt that of Kepler, which is the common ellipſis; to which Seth Ward, though he himſelf keeps to it, thinks one might venture to ſubſtitute circular orbits, by uſing two points, taken at equal diſtances from the centre, on one of the diameters, as they do in the foci of the ellipſis. The ſecond is that of M. Caſſini, whoſe character is this; that the products of the right lines, drawn from each point of its circumference, are every where equal; whereas, in the common ellipſis, it is the ſum of thoſe right lines that is always the ſame. M. Varignon ſhews how inconſiſtent Copernicus's ſentiment is with the mechaniſm of the heavens: ſince the forces which planets have, to retain them in their orbits, muſt almoſt always conſpire to make them move with really different velocities: and that, among an infinity of caſes, there is but one in which they can move uniformly.

The ſemidiameter of the earth's orbit is now ſtated to be 94,696,969 miles Engliſh, and the ſemidiameter of Saturn's orbit about ten times as great.

The orbits of the planets are not all in the ſame plane as the ecliptic, or the earth's orbit round the ſun; but are variouſly inclined to it, and to one another: but ſtill the plane of the ecliptic interſects the plane of the orbit of every planet in a right line, which paſſes through the ſun. See PLANET.

The orbits of comets Caſſini takes to be rectilinear; but they are now known to be very eccentric ellipſes. See COMET.

ORBITARIA FORAMINA, in *Anatomy*, two ſmall holes on the inner ſide of the orbit. See CRANIUM.

ORBITELLO, in *Geography*, a town of the Sienneſe, but belonging to Naples; ſituated on the E. ſide of a lake, near the coaſt of the Mediterranean, with a good harbour, and well fortified; 65 miles N.W. of Rome. N. lat. 42° 31′. E. long. 11° 6′.

ORBONA, in *Mythology*, a goddeſs worſhipped at Rome, who was invoked in behalf of orphans, or to comfort fathers and mothers for the loſs of their children.

ORBOZ, in *Geography*, a town of Great Bucharia, on the Bamian; 15 miles S. of Balk.

ORBY, a town of Sweden, in Weſt Gothland; 28 miles E.S.E. of Gotheborg.

ORCHAMPS, a town of France, in the department of the Jura; 9 miles W. of Quingey.

ORCHAMPS *en Vennes*, a town of France, in the department of the Doubs; 15 miles E. of Ornans.

ORCHAN, in *Biography*, ſon of Othman, the founder of the Ottoman dynaſty, diſtinguiſhed for his valour, reduced,

duced, during the reign of his father, the important city of Prusa, or Bursa, the capital of Bithynia. On the death of Othman, in 1326, Orchan was declared his successor on the Turkish throne. "From the conquest of Prusa," says the historian, "we may date the true era of the Ottoman empire. The lives and possessions of the Christian subjects were redeemed by a ransom of thirty thousand crowns of gold; and the city, by the labours of Orchan, assumed the aspect of a Mahometan capital. Prusa was decorated by a mosque, a college, and an hospital of royal foundation; the Seljukian coin was changed for the name and impression of the new dynasty; and the most skilful professors of human and divine knowledge, attracted the Persian and Arabian students from the ancient schools of Oriental learning. Orchan nominated his brother Aladin for his vizier, and he next introduced great improvement into his army. In the second year of his reign he took the city of Nicomedia, by means of a newly invented train of battering engines: and soon after made himself, by the same means, master of Nice. Orchan granted a safe-conduct to all who were desirous of departing with their families and effects, but the widows of those who were slain in defending their cities, were given in marriage to the conquerors, and the sacrilegious plunder was sold and ransomed at Constantinople. Orchan subdued the whole province or kingdom of Bithynia, as far as the shores of the Bosphorus and Hellespont; and the Christians confessed the justice and clemency of a reign which claimed the voluntary attachment of the Turks of Asia. Yet Orchan was content with the modest title of emir, and in the list of his compeers, the princes of Roum or Anatolia: his military forces were surpassed by the emirs of Ghermian and Caramania, each of whom could bring into the field an army of 40,000 men." Orchan having formed an alliance with John Cantacuzenus, great domestic of the Constantinopolitan court, and afterwards emperor, he adopted his interest in the civil dissentions of that capital, and at length demanded one of his daughters in marriage. Notwithstanding the difference of religion and manners, the circumstances of the empire did not permit a refusal, and Theodora was given to Orchan with great solemnity. After the resignation of Cantacuzenus, the bands of alliance between the Greek and Turkish emperors being dissolved, Solyman, son of Orchan, openly invaded Thrace, and made himself master of Gallipoli, the key of the Hellespont. The young man was soon after killed by accident, while exercising his troops, and Orchan was so much affected by the loss of his son, that he soon followed him to the grave. This event happened in the year 1360, when he was about seventy years of age. The piety and justice of this prince are greatly extolled by Turkish historians. They say that he daily conversed with the learned, and would undertake nothing of moment without their advice and sanction: and he was the first of their monarchs who founded schools and hospitals. He certainly deserves to be regarded as one of the principal founders of the Ottoman greatness. Univer. Hist. Gibbon, vol. xi.

ORCHARD, in *Gardening*, a portion of garden ground set apart for the growth of the different sorts of the more common kinds of fruit, but chiefly that of the apple kind. The trees in this case are mostly of the standard kind, especially when large supplies of fruit are wanted, and generally consist of apple-trees, pear-trees, plum-trees, and cherry-trees; and, to render the orchard more complete, it should contain quinces, medlars, mulberries, service-trees, filberts, Spanish nuts, and barberries, as well as walnuts and chesnuts. As the two last sorts are well adapted for sheltering the others from high winds, they should, Mr. Forsyth thinks, be planted in the boundaries of the orchard, a little closer than ordinary for that purpose.

In providing trees, especially of the apple kind, for this purpose, too much care cannot be taken to admit of none but such as have good roots, fair clean stems, and proper heads; and at the same time attention should be paid that a proper assortment of the different sorts be procured for the supply of the table during the whole year. A few of the summer sorts are sufficient, but more of the autumn, and still a larger quantity of the winter kind will be necessary; as upon this last sort the chief dependence must be placed, from the beginning of the year till nearly the period of the fruit being ready again.

In districts where the process of cider-making is conducted upon a large scale, large orchards of apples only are often met with; and in some counties, as Kent, there are orchards wholly of cherries, or of these and filberts. In general, however, there ought to be a much larger proportion of apples than of any other fruit in orchards, as in proper situations they are very profitable; and, in addition, the trees have a delightful appearance when in blossom, as well as when the fruit is ripe.

*Situation and Soil.*—In respect to situation, an orchard should rather be elevated than low, as on a gentle declivity, open to the south and south-east, to give free admission to the air and rays of the sun, as well as dry up the damps and disperse the fogs, in order to render the trees healthy, and give a fine flavour to the fruit. It should likewise be well sheltered from the east, north, and westerly winds, by suitable plantations, where not naturally sheltered by hills or rising grounds. Such plantations, when they consist of forest-trees, should neither be too large nor too near the orchard; as where that is the case, they prevent a free circulation of air, which is injurious to the trees. Where the ground does not admit of such plantations, Mr. Forsyth advises planting cross rows of fruit-trees, in the manner directed in gardens, as well as some of the largest growing trees, nearest the outsides exposed to those winds, two or three rows of which should be planted closer than ordinary, which would greatly shelter those in the interior parts of the orchard, and be of great service, in addition to the walnut and chesnut trees, as mentioned above.

Orchards are planted on many different sorts of soil, and succeed well; but a dry, friable loam is probably the most suitable, as trees of this sort are impatient of moisture. Such as have been mentioned for gardens will answer perfectly well, and such as produce good crops of corn, grass, or other vegetables, are mostly proper for an orchard; and though the above sort is to be preferred, that of a good quality, not too light or dry, nor wet, heavy, or stubborn, but of a moderately soft and pliant quality, will be found to answer the end perfectly. The shingly and gravelly soils disagree very much with fruit-trees, unless there be loam intermixed with them. They succeed much better on a chalk bottom, or subsoil. On such a soil Mr. Forsyth has seen roots twelve feet deep, and the trees thrive well. Where the bottom is clay, the roots should be cut-in once in four years, to prevent them from penetrating the clay, which would greatly injure the trees. Whatever the nature of the soil may be, it should have a good depth, as two or three feet. Where the soils are wet, they should be well drained, in the same manner as directed for gardens; or by forming the land in ridges, with furrows between the rows to convey off the moisture, the turf being re-laid in case of the ground being in the state of fward.

*Form and Size.*—In regard to the size of an orchard, it may vary from one to ten and fifteen or more acres, according

ing to the quantity of fruit wanted, or the proportion of ground that is fit for the purpoſe. The beſt form is that of the ſquare where it can be had, but other forms anſwer very well.

*Preparation.*—This is effected in different ways; but the beſt method is, probably, before planting the trees, to trench it two ſpits deep, and ten feet broad, where the rows are to be planted, and to looſen a ſpit below, unleſs it be clay, which ſhould, Mr. Forſyth ſays, be trodden down. Where the ground is in paſture, it ſhould be ploughed, and well ſummer-fallowed, till the graſs be killed, otherwiſe when it is laid in the bottom in trenching, which it generally is, it will be very apt to breed grubs, which do much miſchief. In bad ſhingly or gravelly ſoils, he recommends that holes ſhould be dug at leaſt three feet deep, and filled up with good mould: if mixed up with rotten dung, rotten leaves, or other manure, the trees will in time amply repay the expence: the dung uſed for this purpoſe ſhould be that from the melon and cucumber beds, mixed with the mould from the ſame, when the beds are broken up in autumn, or winter; and be laid up in heaps, and continued ſo for one year at leaſt; but be frequently turned, and have ſome good freſh mould mixed with it. It is the practice with ſome to only dig holes large enough to receive the roots, eſpecially in graſs-ground, which is to be continued ſo. Others prepare the ground by deep ploughing, if the orchard is to be of great extent. The ſward, if paſture, ſhould be ploughed in ſome time in ſpring; a good ſummer-fallow ſhould be given it, ploughing it two or three times, which will rot the turf. A fortnight or three weeks before planting, it ſhould have a good deep ploughing, to prepare it for the reception of the trees. In Kent, and ſome other hop diſtricts, they prepare their orchard-ground, by the growth of hops upon it with the fruit-trees, by which they are much protected and brought forward.

*Seaſon of Planting.*—In relation to the period of planting, it may be performed with ſucceſs at different ſeaſons, according to the nature of the land. The beſt time for planting on a dry ſoil is, Mr. Forſyth ſays, in October; but, if wet, the latter end of February, or the month of March, will be a more fit ſeaſon. The chief circumſtances in this buſineſs is to ſuit the trees as much as poſſible to the ſoil, and to plant them at proper diſtances from each other; which may be from forty to eighty feet, according to the ſize of the trees when full grown. He obſerves that fruit-trees, when planted too thick, are very liable to blights, and to be covered with moſs, which robs them of a great part of their nouriſhment, beſides ſpoiling the flavour of the fruit. The diſtance ſhould be regulated by the nature of the orchard in a great degree.

*Procuring the Trees.*—In providing the trees, it is a good practice to procure them from a ſoil nearly ſimilar to, or rather worſe than, that where they are intended to be planted; as trees tranſplanted from a rich ſoil to a poorer one never thrive ſo well; but if from a poor to a richer ſoil, they generally ſucceed in a perfect manner. Good trees, which have been properly pruned, which are quite free from bruiſes and diſeaſe, ſhould always be carefully ſelected; and their roots be preſerved as much as poſſible when taken up.

The moſt proper ſorts of trees for ſmall orchards may be thoſe of the janeting, golden pippin, noneſuch, Ribſton pippin, nonpareil, queen, ſky-houſe, golden rennet, aromatic pippin, grey Leadington, ſcarlet pearmain, lemon pippin, pommegriſe, French crab, ruſſeting, and codling kinds. But various other ſorts may be employed where the orchards are extenſive, and a great variety of fruit neceſſary.

*Planting the Trees.*—With regard to the proper diſtance of planting the trees, it ſhould be regulated by the natural growth or ſpreading of them when fully grown, as well as the nature and goodneſs of the ſoil. It was formerly the practice to have them put in at narrow diſtances; but at preſent ten, twelve, or fifteen yards are more common, and in the cider diſtricts from twenty to twenty-five yards are in uſe. The uſual mode of arranging the trees is, in open grounds in lines or rows; but in cloſe plantations the quincunx method is more in uſe. In the row method, when it can be done, they ſhould be in the direction of north and ſouth, or one point more to the eaſt, as by this means they will have the advantage of the ſun from the early part of the morning, in the ſpring ſeaſon, which will in a great meaſure prevent the damp fogs from hanging upon them, and hindering the due increaſe of the fruit.

In the act of planting or putting them into the ground, great care ſhould be taken that they are not put in to too great a depth, as where that is the caſe they are in great danger of being deſtroyed. It is alſo neceſſary that a bed of fine good mould be provided for them, and that it be carefully put in with them, ſo as to be properly inſinuated among the fibres of the roots, and afford them due ſupport; the whole being carefully trodden round the plants in finiſhing the buſineſs. Upon this being performed in a proper and perfect manner, and the young trees afterwards kept perfectly ſteady by ſuitable ſupports, the ſucceſs of the planter in a great meaſure depends.

Where the trees are planted in the quincunx order, and at the diſtance of eighty feet, Mr. Forſyth ſays, the ground between the rows may be ploughed and ſown with wheat, turnips, &c. or planted with potatoes: the ploughing or digging the ground, provided it be not done ſo deep as to hurt the roots, by admitting the ſun and rain to meliorate the ground, will keep the trees in a healthy flouriſhing ſtate. It will be neceſſary to ſupport the young trees by tying them to ſtakes until they are well rooted, to prevent their being looſened or blown down by the wind.

In the ſpring, after planting, if it prove dry, ſome turf ſhould be dug and laid round the ſtems of the young trees, with the graſſy ſide downwards; which will keep the ground moiſt, and ſave a deal of watering: if the trees have taken well, this need not be repeated, as they will be out of danger the firſt year. The turf ſhould be laid as far as the roots of the trees are ſuppoſed to extend; and when it is rotted, it ſhould be dug in, which will be of great ſervice to their roots.

Such trees as are of very different ſizes when full grown, ſhould not be planted promiſcuouſly; but, if the ſoil be properly adapted, the larger planted in the back parts or higher grounds, or at the north end of the rows, if they run nearly north and ſouth, and the others in ſucceſſion, according to their ſize. The trees, when planted in this manner, will have a fine effect when grown up; but if they are planted promiſcuouſly, they will not appear ſo agreeable to the eye; and, beſides, the ſmaller trees will be ſhaded by the larger, which injures them, and ſpoils the flavour of the fruit.

It is adviſed that orchards ſhould be dunged once in two or three years with ſome ſort of good manure, as this is of much advantage in rendering them fruitful and productive.

The ſtems of the trees in thoſe where cattle feed, ſhould be high enough to prevent their eating the lower branches; and fenced in ſuch a manner as to prevent their being barked, or injured by the cattle rubbing againſt them, particularly when young; which may be done by triangles of wood, or the trees may be buſhed with thorns.

But in orchards where cattle are not permitted to go, Mr.

Forſyth prefers dwarf-trees to ſtandards, taking care to proportion the diſtance of the rows to the ſize of the trees.

*Management afterwards.*—This chiefly conſiſts in keeping the trees properly pruned and cut in; as where this is judiciouſly done, the trees will come into bearing ſooner, and continue in vigour for nearly double the common time. But with theſe ſtandard-trees leſs culture is neceſſary than in other caſes. No branch ſhould ever be ſhortened unleſs for the figure of the tree, and then it ſhould be taken off cloſe at the ſeparation. The more the range of branches ſhoot circularly, a little inclining upwards, the more equally will the ſap be diſtributed, and the better the tree bear. The ranges of branches ſhould not be too near each other, that the fruit and leaves may not be deprived of their full ſhare of ſun; and where it ſuits, the middle of the tree ſhould be ſo free from wood, that no branch may croſs another, but all their extremities point outwards.

About October or November, or as ſoon as the fruit is removed, is the moſt proper ſeaſon for this work. It is the beſt practice to take off ſuperfluous branches with a ſaw, and afterwards to ſmooth the place with a knife; for it is eſſential that every branch that is to come off ſhould be cut perfectly cloſe and ſmooth. The wounded part may then be ſmeared over with a proper compoſition. Such branches ſhould always be taken off as come near to the ground, that have received any material injury, where the leaves are much curled, or that have a tendency to croſs the tree, or run inwards. And a little attention may be given to the beauty of the head, leaving all the branches as nearly equidiſtant as poſſible. Where there are any remaining blotches, they ſhould be opened or ſcored with a knife; and where the bark is ragged from any laceration, it ſhould be pared gently down to the live wood: touching over each with a proper compoſition. This being done, the moſs ſhould be rubbed clean off, and the trees ſcored. In this laſt operation, care ſhould be taken not to cut through the inner or white rind, which joins the bark to the wood. When trees are much thinned, they are ſubject to throw out a great quantity of young ſhoots in the ſpring, which ſhould be rubbed off, and not cut, as cutting is apt to increaſe the number.

The great enemy to orchards where apples is grown, is miſletoe, and it is often permitted to become very injurious to them. The uſual method of clearing trees from it, is to pull it out with hooks in froſty weather, when brittle, and readily broken off from the branches. A labourer is capable of clearing fifty or ſixty trees in a day.

Moſs, moiſt ſpring froſts, blights, and ſeveral other ſimilar cauſes, are highly injurious to this ſort of tree, as is ſhewn under theſe particular heads.

Orchards, in *Huſbandry*, ſuch as are formed in fields for the purpoſe of affording the liquor called cider. Theſe orchards are very extenſive in many diſtricts, and form the chief part of the produce of the countries where they exiſt. The manner of forming them is ſtated above. There are a great many varieties of apples and pears made uſe of in theſe orchards.

It is remarked in the Herefordſhire Report on Agriculture, that the apple and pear-trees which form the orchards of that diſtrict, are well known not to be the natural production of any ſoil or climate, the one being a variety of the *pyrus malus*, or crab, and the other derived from the *pyrus communis*, or common wild pear; as ſuch, neither of them are noticed by Linnæus. The native wild crab is ſubject to conſiderable diverſity in the appearance of its leaves, and in the colour, ſhape, and flavour of its fruit.

By ſelecting and cultivating the beſt of theſe, all our valuable varieties have been produced, and by repeated propagation have been preſerved for the time. This principle was, it is ſaid, clearly known by the ancients, whether they applied it to the apple or not; as is evident from Virgil. And it is added that Normandy, and other parts of the continent, have occaſionally furniſhed this country with ſeveral of theſe artificial varieties. It is likewiſe ſtated, that the apple-trees are divided into *old* and *new* ſorts; each claſs compriſes ſome called *kernel* fruits, namely, the fruit growing on its native root, as a diſtinction from thoſe produced by the operation of grafting.

The old ſorts are the more valuable, and are thoſe which have been long introduced, ſuch as the ſtire, golden pippin, hagloe crab, ſeveral varieties of the harvey, the brandy apple, red ſtreak, woodcock, moyle, gennet moyle, red, white, and yellow muſks, pauſon, fox-whelp, loan and old pearmains, Dymock red, ten commandments, and others. Some of theſe names are deſcriptive of the fruit, and others are derived from the places where they have been firſt found, or found in moſt abundance. The modern varieties derive their appellations from ſuch various and capricious cauſes, that a correct liſt cannot be compoſed; in ſeveral inſtances, the ſame fruit bears a different name, even in the ſame pariſh. A regular and ſcientific claſſification of the whole would be, it is ſuppoſed, a valuable acquiſition to our rural economy, and there are at this time perſons of opulence and public ſpirit fully adequate to ſuch an undertaking.

The pears held in moſt eſtimation, are the ſquaſh, ſo called from the tenderneſs of its pulp; the old-field, from having grown as a ſeedling in a field of that name: the huff-cap, from the quantity of fixed air contained in its liquor; the bar-land, from fields in the pariſh of Boſbury, called the Barlands, which were anciently held under the tenure of conveying the proviſion of the lord, or Barelands, from their deficiency of produce at ſome particular period; the ſack pear, from its richneſs; and the red pear, from its colour.

Of the more common ſorts, the long-land is the moſt valuable, and, for the general uſe of the farmer, perhaps the beſt of any. See Apple, Apple-*tree*, and Cider.

In regard to the cider fruits, it has been remarked, that as the decay of the old and moſt valuable fruits in Herefordſhire is ſo generally acknowledged and lamented, their renovation, or the introduction of others equally good, cannot be too ſtrongly urged; and that the public ſpirit of the preſent age has not been indifferent on the occaſion, as more endeavours have perhaps been directed towards this object within the laſt twenty years, than during a century preceding. Grafting, as moſt expeditious, has been moſt frequently attempted; but it is preſumed that no mode of grafting hitherto practiſed has been found adequate to the purpoſe. The ſhoots, being unavoidably taken from old trees, flouriſh during a few years from the vigour of the crab ſtock, and relapſe into all the infirmities of the parent tree. On this principle, the renovation of the old fruits appears impracticable. By the general laws of nature, each animated being lives to propagate its ſpecies, and after a time reſigns its place to a ſucceſſor. Mr. Knight obſerves, that the branch, from which a graft is taken, evidently partakes of the life of the tree to which it belongs; and that it is equally evident, that when part of a tree is detached, no new life is communicated, whether it be uſed as a graft, or placed to emit roots as a cutting: thus a tree, raiſed from a cutting, ſoon produces fruit in every reſpect ſimilar to that of the tree from which it was taken. He



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alſo remarks, that the habits of ſeedling trees are very eſſentially different, that their leaves are ſmall and thin, and that the general habit changes gradually, aſſuming annually a more cultivated character: thus, if a graft be taken from a ſeedling tree of one or two years old, it will retain the character, and undergo the ſame annual change as the ſeedling tree, whatever be the age of the ſtock into which it is inſerted; and that it will remain unproductive of fruit or bloſſom, until the ſeedling tree has acquired its proper age and maturity.

Hence he infers, as before mentioned, that the cutting muſt partake of the life, and conſequently of all the habits of the original tree. In ſupport of this theory, he ſtates that a ſeedling walnut, grafted with a part of the bearing branch of an old tree, produced bloſſom at three years old; that the Spaniſh cheſnut, under a ſimilar proceſs, bloſſomed in the year after it was grafted; and that an annual ſcion of a mulberry-tree, thus grafted, bore a plentiful crop of fruit (conſidering its ſize) in the third year after, and has continued to bear every year ſince. The grafts in theſe caſes, Mr. Knight remarks, muſt have carried the nature and habits of the parent tree with them; and if they retain the habits, it may fairly be inferred that they retain alſo the ſame progreſſive tendency to decay. In ſhort, a tree, like an animal, has "its infancy, its flowering ſpring, its ſummer's ardent ſtrength, its ſober autumn fading into age, and its pale concluding winter."

The opinion of the beſt informed planters is, that the ſeeds of the old fruits ſhould be ſown, and the moſt ſtrong and healthy plants ſelected for cultivation, and a ſupply of grafts. This experiment has been adopted on a large ſcale by ſeveral planters, has hitherto promiſed the fulleſt ſucceſs, and has, further, the ſanction of that period in which orcharding received particular attention. And it is added, that a treatiſe on this ſubject was publiſhed by W. Lawſon, a north countryman, in the year 1626; and he ſtates, that the very beſt way to plant an orchard is to turn the ground with a ſpade in February, and to ſet, from February to May, ſome kernels of the beſt and ſoundeſt apples and pears a finger deep, and a foot diſtance; and to leave the likelieſt plants only in the natural place, removing the others as time and occaſion ſhall require. And that lord Scudamore alſo fully underſtood the nature and value of this practice; who, on retiring to Horn Lacy, amidſt other uſeful and honourable employments of a country life, paid great attention to the culture of fruit-trees, and particularly to that of the red ſtreak, which he ſeems to have introduced into general notice and eſteem. As late alſo as the year 1654, a treatiſe, called "The Countryman's Recreation, or the Art of Planting, Grafting, &c." remarks, that "although the pippins be ſown of the pomes of pears and good apples, yet we ſhall find that ſome of them do love the tree whereof they came, and thoſe be right which have a ſmooth bark, and are as fair as thoſe which be grafted." Theſe inſtances, it is preſumed, are ſufficient to ſhew that, at the period alluded to, it was well known, that good fruits might be raiſed by ſowing the kernels of good apples, and ſelecting thoſe plants, which, in the abſence of thorns, and in the general appearance of their leaves and bark, bore the greateſt reſemblance to the cultivated variety of the parent tree; whilſt thoſe which approach the native crab were carefully rejected.

Yet Evelyn, in the Appendix to his Sylva, publiſhed ſeveral years afterwards, proves that the practice was hardly known there in his time. He writes, nothing is more facile than to raiſe new kinds of apples *in infinitum* from kernels; yet in that apple county (Hereford), ſo much addicted to orchards, we could never encounter more than two or three perſons that did believe it. This method, however, is now becoming more and more general. The writer ſays, ſeveral thouſand grafts, thus raiſed, are yearly diſtributed by the Agricultural Society, and are ſought for with the utmoſt avidity. The moſt experienced planters conſider it as the beſt, if not the only, expedient to preſerve their provincial celebrity; and nothing ſurely can be more unphiloſophical than to ſuppoſe that a piece of old dying tree can ever form a healthy and vigorous one.

It is added, that Mr. Knight has now many ſeedling apple-trees, produced between the Siberian crab and our richeſt apples. The vigour of moſt of them is aſtoniſhing. And as they bloſſom as early as the pear-trees, he is convinced that they will be found of great value, particularly in high ſituations, where the Siberian very rarely fails to produce a good crop of fruit.

In reſpect to the management afterwards, it chiefly conſiſts in keeping the trees properly pruned, thinned, and cut in as above. In Herefordſhire, large branches are rarely or never amputated. The inſtrument generally uſed for the purpoſe of pruning is a ſtrong flat chiſſel, fixed to a handle ſix feet or more in length, having a ſharp edge on one of its ſides, and a hook upon the other.

It has been ſtated by the author of the Treatiſe on Fruit-trees, that when young trees are planted out from the nurſery, as ſoon as they begin to break in the ſpring, they are to be cut down to three or four eyes, according to their ſtrength, to furniſh them with bearing wood. If this were not done, they would run up in long naked branches, and would not produce one quarter of the fruit which they do when this operation is properly performed. The ſame holds good in healing all kinds of old trees.

An opinion prevails, particularly in thoſe parts where apple-trees are cultivated to any conſiderable extent, that trees never will bear after being headed down, and that it kills them. This may no doubt happen when they are improperly headed down all at once, by giving a ſudden check to the ſap, the few weak ſhoots not having ſtrength to draw up what is ſupplied by the roots; and, moreover, not being capable of ſheltering one another, they are chilled by the cold, and ſo rendered at leaſt unproductive, if they are not totally killed. But if heading were done gradually, that is, if every other branch all over the tree were headed at a proper length, cutting as near to thoſe parts where the ſhoots appear as poſſible, in the months of February or March, or even as late as May, in the courſe of the ſummer they would throw out fine long ſhoots. Theſe ſhould not be ſhortened the firſt year, unleſs it be neceſſary to ſhorten a few, to fill up the head of the tree with bearing wood; and that ſhould be done in the following ſpring, cutting them to ſix or eight inches long, according to their ſtrength. In the next ſpring, after the firſt branches are headed, the remaining old branches may be cut out, and theſe will ſoon fill the head of the tree with fine bearing wood. In three years, if properly managed, trees ſo headed will produce a much greater quantity of fruit, and of a better quality, than they did before the operation was performed. It has been remarked, that the management of orchards is capable of being reduced to a ſyſtem under a few general heads, concentered in the principle of making all trees in orchards healthy, round, large, and beautiful.

Due pruning would greatly prevent the ſpeckled and ſtunted fruit, occaſioned by the trees being overloaded with wood, which obſtructs the rays of the ſun, and cauſes a vapour, the cold whereof ſtunts the fruit in its firſt growth. When branches of any great ſize are to be cut off, Mr. Bucknall found it impoſſible to take them off by a bill,

without leaving a ſtump, or improper wound: and as it is eſſential that every branch be cut perfectly cloſe and ſmooth, he uſed ſaws, and afterwards ſmoothed over the ſaw-cut with a knife, immediately applying his medicated tar to the wound. The medicated tar is compoſed of half an ounce of corroſive ſublimate, reduced to a fine powder, and put into a three-pint pipkin, with a glaſsful of ſpirits of hartſhorn, and ſtirred well together till the ſublimate is diſſolved. The pipkin is then filled by degrees with common tar, and conſtantly ſtirred till the mixture is blended as intimately as poſſible. This compoſition has been found by Mr. Bucknall to anſwer the purpoſes of excluding the air, keeping off inſects and vermin of every deſcription, and of aſſiſting the wound to heal. But the compoſition directed by Mr. Forſyth is probably much better.

In heading down old decayed apple-trees, for the ſake of ſymmetry, the author of the Treatiſe on Fruit-trees ſays, it will be neceſſary to cut at the forked branches, as near as can be to the upper ſide of the fork, cutting them in a ſloping manner, to carry off the wet, at the ſame time rounding the edges. The orchardiſt may begin at the lower branches, cutting juſt above the lower bark, and proceeding upwards, cut the reſt of the branches to ſix joints or forks, according to their ſtrength, till he have finiſhed cutting in the whole head. If any of theſe branches ſhould have the canker, all the infected part muſt be cut out. When the tree is all prepared, the compoſition muſt be immediately applied, beginning at the top of the tree, and finiſhing with the powder of wood-aſhes and burnt bones in deſcending, which will ſave its being rubbed off during the operation, and the compoſition will prevent the ſun and air from injuring the naked inner bark. A tree thus prepared will, in the courſe of three or four years, produce more and finer fruit than a maiden tree that has been planted upwards of twenty years.

Mr. Marſhall remarks, in his "Rural Economy of Glouceſterſhire and Herefordſhire," that ſpring froſts are an enemy, againſt which, perhaps, it is moſt difficult to guard orchard trees. Dry froſts are obſerved to have no other effects than keeping the bloſſoms back; conſequently, are frequently ſerviceable to fruit-trees. But wet froſts, namely, froſts after rain or a foggy air, and before the trees have had time to dry, are very injurious even to the buds. An inſtance is mentioned, in which a flying hazy ſhower in the evening was ſucceeded by a ſmart froſt: that ſide of the trees againſt which the haze drove was entirely cut off; while the oppoſite ſide, which had eſcaped the moiſture, likewiſe eſcaped the effect of the froſt.

Much, however, may depend on the ſtrength of the bloſſoms. The ſpring of the year (1788) had its froſts, and all hope of fruit was more than once given up; yet for quantity and quality, taken jointly, there has ſeldom perhaps been ſo favourable a fruit year. But this year, the buds formed, and the bloſſoms broke forth with unuſual vigour; and were enabled, by their own ſtrength, to ſet common enemies at defiance. On the contrary, the preceding ſpring, many of the bloſſoms ſickened in the bud, and thoſe which opened were weak and languid: the conſequence was, in the inſtances he obſerved, ſcarcely an apple ſucceeded.

The aſſiſtance, therefore, required from art in this caſe, is, by keeping the trees in a healthful vigorous ſtate, to enable them to throw out a ſtrength of bud and bloſſom; and by keeping them thin of wood, to give them an opportunity of drying quickly before the froſt ſets in. See BLIGHT.

The author of the Report for the county of Hereford ſays, that the pear, although, in general, producing an inferior liquor, poſſeſſes many advantages for general culture, when compared with the apple. It will flouriſh in a greater variety of ſoils, is more productive, and being incapable (in thoſe ſorts which are proper for perry) to be eaten or applied to any common culinary purpoſe, it is little ſubject to be ſtolen, even in ſituations where fruit does not abound. As an ornamental tree, it poſſeſſes ſufficient merit to entitle it to a place where ornament is the principal object; its form is often picturesque, and it bloſſoms in the ſpring, and its fruit in autumn is always beautiful. Every tree, when nearly full grown, will afford, in moderately good ground, an annual produce of twenty gallons of liquor, (taking many years together,) even at the loweſt calculation. Many ſingle trees in Herefordſhire have produced a hogſhead in one ſeaſon, and an extraordinary tree growing on the glebe land of the pariſh of Hom Lacy has more than once filled fifteen hogſheads in the ſame year; when the branches of this tree, in its original ſtate, became long and heavy, their extreme ends ſucceſſively fell to the ground, and taking freſh root at the ſeveral points where they touched it, each branch became a new tree, and in its turn produced others in the ſame way. Nearly half an acre of land remains thus covered at the preſent time. Some of the branches have fallen over the hedge into an adjacent meadow, and little difficulty would be found in extending its progreſs. An acre of land is capable of containing thirty pear-trees of uſual dimenſions, which, taken from new varieties of fruit, would probably continue in a productive ſtate beyond the concluſion of a ſecond century. The produce of an acre planted with apple-trees, will generally be found nearly one-third leſs than the ſame quantity of ground planted with pear-trees would afford, with the exception of the halmer pear, and the old-field; but the apple-tree begins to bear at an earlier age, and cider will ever be juſtly preferred to the juice of the pear. As an object of ſight, the pear-tree has every advantage over its rival; but Mr. A. Knight is of opinion that under the ſyſtem now practiſing, to procure new varieties, the apple-tree may, in ſome degree at leaſt, acquire the recommendation of ornament, as well as uſe; thoſe croſſed with the Siberian crab promiſe to be of this deſcription. The value of the ground as a paſture in cloſely planted orchards will neceſſarily be much reduced, but the loſs of herbage will in a few inſtances amount to more than one-tenth of the value of the fruit.

The graſs produced in an orchard comes very early in the ſpring, when it is peculiarly valuable to the farmer. Under judicious management it is never ſuffered to grow long or coarſe, and an orchard in this condition will be found to ſupport a very conſiderable quantity of ſtock.

It is further obſerved in the ſame report, that if the apple and pear-trees were thinly diſperſed over the meadows and paſtures of every diſtrict in which they would ſucceed, the injury done to the herbage would be extremely ſmall; and the trees might perhaps be made to ſupply the whole population of the country employed in agriculture, with as wholeſome and palatable a beverage as they now poſſeſs, and in fruitful years a large quantity would be afforded for the uſe of the towns. The number of acres now employed in raiſing hops and poles to ſupport them, might be greatly reduced, and this alone would prove an immenſe advantage to agriculture. Hops at preſent occupy the beſt ground the farmer has to give them, they take his beſt manure, they are too often the principal objects of his attention, and whilſt their culture injures the crops of corn in every diſtrict where they abound, it may be queſtioned whether the produce of a thouſand acres annually afford nutriment ſufficient to ſupport a human

a human being. By an extended culture of the apple and pear, many millions of buſhels of barley, now converted into malt, might be annually ſaved and applied to better purpoſes.

The ground now employed in its culture might be made to produce wheat, or other articles immediately neceſſary to ſociety; and that the juice of the apple and pear will afford a liquor as wholeſome as any which can be obtained from malt, is ſufficiently evinced by the general appearance of the natives of this and other cider counties.

In the diſtrict of Kent, according to Mr. Marſhall, in ſome inſtances the interſpaces of young orchards are occupied by hops, in others by filberts, and in grown orchards the latter are ſometimes ſeen. Some old orchards are likewiſe in permanent ſward, others under arable or garden crops, and ſome in ſainfoin, while others are in lucern. See PLANTING, FRUIT-*Trees*, and APPLE-*Tree*.

It has been obſerved by the author of the Rural Economy of Glouceſterſhire and Herefordſhire, that the cultivation of fruit-trees, for the ſole purpoſe of liquor, is peculiar to the weſtern provinces. The ſouthern counties, when the London markets are overſtocked with fruit, make a ſort of liquor from the ſurplus; but the eaſtern, the northern, and the midland counties, may be ſaid to be as much unacquainted with the buſineſs of a liquor-orchard, as they are with that of a vineyard. Even Staffordſhire, which is divided from the cider country by a narrow ridge of hill only, has not, generally ſpeaking, a barrel of cider made within it.

Herefordſhire has ever borne the name of the firſt cider county; Glouceſterſhire, however, claims a preference in the two moſt celebrated fruit-liquors the diſtrict affords. Worceſterſhire and Monmouthſhire have their claims of excellency. May Hill may be conſidered as the centre of this diviſion of the cider country.

Devonſhire, and its environing counties, form another diviſion; which, though upon the whole much inferior to this, produces one ſpecies of liquor (the coccagee cider,) which is in high eſtimation. See CIDER.

Perſons robbing orchards are to make ſuch recompence of damage as a juſtice ſhall award, and forfeit not exceeding 10*s.* or be ſent to the houſe of correction, &c. Stat. 43 Eliz. cap. 7. See LARCENY.

ORCHARD, *Cherry*, in *Agriculture*, that ſort of orchard which is principally deſtined to the raiſing of cherries. Theſe ſorts of orchards are common in the county of Kent, in which the common black cherry is moſtly cultivated, though, according to Mr. Marſhall, it is now on the decline. In Hertfordſhire, about King's Langley and Watford, they employ the caroon and ſmall black, as the Kentiſh will not thrive there at all. In Kent they are planted in lines at the diſtance of twenty feet aſunder, but in Hertfordſhire they allow each tree nine ſquare perches of land. In about two years after planting, cherry-trees begin to bear, and a full-grown tree will produce fifty dozen pounds in a good year, and from ten to twenty years ſix dozen. The prices vary from ten-pence to three ſhillings the dozen. They are very beneficial to the poor in the quantity of employment which they afford in gathering the crop, in which they are paid from 4*d.* to 8*d. per* dozen pounds.

ORCHARD *Fruit*, that ſort of fruit which is grown in orchards. In ſome diſtricts, and particularly that of Kent, beſides apples and pears, they have other ſorts of orchard-fruits, ſuch as plums, cherries, filberts, &c.

ORCHARD *Graſs*, a ſmall, fine, very ſweet graſs, riſing under the trees in orchards. This ſort of graſs is of a very purgative quality. It ſhould be kept eaten down well, in order to render it the moſt productive.

ORCHESIS, in the *Ancient Pantomime*, was a term given by the Greeks to what the Romans termed *Saltatio*. It conſiſted in imitating all the geſtures, and all the movements practiſed by mankind. Varro tells us that the word *Saltatio* comes from Salus, who firſt taught the art to the Romans. We muſt not, as is generally done, confound the dance with the leap; but remember that the true dance of the ancients was an imitation of the actions, attitudes of the body, geſtures, in ſhort, of all the demonſtrations with which men commonly accompany their ſpeech, or which they ſometimes uſe to explain their ſentiments without the aſſiſtance of words.

The art was divided into many ſpecies, and had produced among the ancients ſuch a number of different dances, that Meurſius compoſed an entire dictionary with their names. According to Athenæus, Theloſtes was the inventor of this kind of dance, which we call the *acting art*.

This was, of all the muſical arts, that of which the ancients were moſt paſſionately fond, and which was of the greateſt utility in every ſtate of life, from the ſtrolling player to the orator.

Apuleius has left us a deſcription of a repreſentation of the Judgment of Paris, executed in pantomime. He only uſes the word *to march*, and ſays, that Venus *declaimed with her eyes*. So that the ancients ſeldom boaſted of feats of activity with the legs and feet of their dancers; but often with their arms and hands. The muſe Polhymnia was the patroneſs of Mimes, with her finger on her mouth in token of ſilence. Some etymologiſts, among whom are Plutarch and Nonnus, derive her name from Μνημη, *tradition*, alluding to the tales and fables of antiquity. Nonnus, Dionyſ. v. v. 104, et ſeq. ſays,

> "Sweet Polhymnia ſee advance,
> Mother of the graceful dance.
> She who taught the ingenious art
> Silent language to impart:
> Signs for ſentiment ſhe found,
> Eloquence without a ſound:
> Hands loquacious ſave her lungs,
> All her limbs are ſpeaking tongues."

See MIME and PANTOMIME.

ORCHESOGRAPHY, the art of noting all the ſteps and motions uſed in dancing. See DANCE.

ORCHESTRA, in the *Drama*, the lower part of the ancient theatre; made in form of a ſemicircle, and ſurrounded by the ſeats.

It was ſo called, becauſe, in the Grecian theatres, it was a place where they held their balls; from ορχεομαι, *I dance*.

The orcheſtra, among the Greeks, made a part of the ſcena; but, on the Roman theatres, none of the actors went down to the orcheſtra, which was taken up with ſeats for the ſenators, magiſtrates, veſtals, and other perſons of diſtinction; anſwering, nearly, to the pit in our theatre.

The orcheſtra of the ancient Greeks had its name from being that part of the theatre where the *dances* were performed. At preſent the word is more particularly applied to the ſtation where a band of muſic is placed in a theatre, or great concert room. The leader of a band, or orcheſtra, ſhould not only be a great and experienced performer, but of a firm and determined character, that commands reſpect for his orders; given without inſolence or tyranny, but in a manner not to be diſputed or diſregarded. All the perfections or defects of an orcheſtra are aſcribed by the public to want of diſcipline or weight in the leader. The numerous



imitative

imitative and pictureſque effects dependant on the orcheſtra of an opera, excite as much attention in the audience, as the poetry and ſinging. The orcheſtra is a compoſer's palette, and each ſolo inſtrument a colour and a pencil. The tone of theſe, whether alone, or in the aggregate, ſhould have their peculiar and general effect, occaſionally, and contribute to the colouring of the piece.

The material of which an orcheſtra is conſtructed, is not a matter of indifference; it ſhould be formed of ſoft and ſonorous wood, ſuch as picked deal or fir; the ſpectators ſhould not be allowed a place ſo near as to lean upon it, and check its vibration. It ſhould be regarded as a grand inſtrument, which accords with all the others, and augments their effects. The arrangement of an opera band ſhould be in ſuch a manner, as that the ſeveral inſtruments may not be too near or too remote from each other. The number of each ſpecies of inſtruments ſhould be proportioned to the effect which they ought to produce when employed together. The baſes, for example, ſhould not ſuffocate the trebles, nor the trebles be overpowered by them. The hautbois ſhould not domineer over the violins, nor the ſeconds over the firſt. The wind-inſtruments and drums, above all, ſhould be kept under, and not fancy that muſic and noiſe are ſynonimous terms. With regard to the diſtribution of the interior, care muſt be taken, firſt, that the violins are ranged in two lines, facing each other, one fronting the ſtage, and the other facing the audience; 2dly, that the baſes ſhould be diſpoſed round the two harpſichords, and in every part of the orcheſtra; as the baſe, which regulates and ſuſtains the harmony of the ſeveral parts, ſhould be equally heard by all; 3dly, that all the performers ſhould have an eye on the maſter at the firſt harpſichord, and the maſter be enabled to ſee them; in the ſame manner each violin ſhould be in ſight of the leader, and each reciprocally ſee and be ſeen by each other.

In 1754, the firſt orcheſtra in Europe for number and intelligence, was that of Naples; but that which was the beſt diſtributed, and formed the moſt complete whole, was the orcheſtra of the king of Poland, at Dreſden, under the direction of the illuſtrious Haſſe; a plate of which is inſerted G fig. 1. in Rouſſeau's Hiſt. de Muſ. The repreſentation of this orcheſtra ſhews how, by a ſingle glance of the eye, an idea may be formed of the diſtribution of the performers, better than by a long verbal deſcription. We aſked ſignor Haſſe at Vienna if this repreſentation of the Dreſden orcheſtra was accurate, and he ſaid it was ſo correct, that he ſhould have imagined that M. Rouſſeau had been an able painter, and made the drawing himſelf.

Rouſſeau finiſhes the article orcheſtra by a contraſted deſcription of that at Paris of the ſame period, which we ſuppoſe has been reformed with the ſtate. It will, however, be hiſtorical, and enable our readers to form ſome idea of what kind that muſic was, and how performed, with which the natives of France were ſo pleaſed and excluſively vain.

"It has been obſerved," ſays the citizen of Geneva, "that of all the orcheſtras in Europe, that of the opera at Paris, though one of the moſt numerous, produced the leaſt effect. The reaſons are very obvious; firſt, the bad conſtruction of the orcheſtra, buried in the earth, and ſurrounded with rails of heavy and maſſy wood, cramped with iron, which impedes all reſonance. 2. The bad choice of the performers, for the moſt part forced on the manager by recommendation, with ſcarce any knowledge of muſic, or the leaſt intelligence or attention to the effect of the enſemble. 3. Their ſtunning and invariable noiſe, tuning, and flouriſhing continually with all their force, without ever being in tune. 4. The French propenſity, which is in general to neglect and diſdain all that becomes a daily labour. 5. The bad inſtruments of the performers, which remaining on the ſpot are always out of order and unfit for uſe, deſtined to roar during one half of the year, and to rot the other. 6. The bad ſituation of the maſter, who is in front of the theatre, and occupied by the vocal performers, is not able to attend ſufficiently to the orcheſtra, which is behind him inſtead of being in full view. 7. The inſupportable noiſe the truncheon of him who beats the time makes, which covers and deſtroys all the effects of the ſymphoniſts. 8. The bad harmony of the compoſitions, which being never pure and ſelect, lets nothing be heard but noiſe and confuſion. 9. The ſcarcity of double baſes and violoncellos, of which the drawling ſounds ſuffocate the melody and deafens the audience. 10. And finally, the total want of meaſure, and indeterminate character of the French muſic, where it is the finger who directs the orcheſtra, inſtead of the orcheſtra regulating the finger, and where the treble leads the baſe, inſtead of the baſe leading the treble."

Sixteen years after this period, the orcheſtra at Bruſſels was the moſt celebrated in Europe, though its performers were the miniſters of French muſic. It was under the direction of M. Fitzthumb, a very active and intelligent maeſtro di capella, who beat the time (which then could not be diſpenſed with), and was indefatigable in preſerving good diſcipline. The orcheſtra was ſo admirably conducted, and the band, taken as a whole, ſo numerous, powerful, correct, and attentive, that if the horns had not been bad and out of tune, the effect of the whole would have approached perfection ſo near as to have tongue-tied criticiſm itſelf.

ORCHIDEÆ, in *Botany*, a moſt natural and very curious order of plants, which has attracted general notice by its beauty and ſingularity, derives its name from one of the principal genera of which it is compoſed, and makes the ſeventh among the natural orders of Linnæus, the third of the fourth claſs in Juſſieu. For the characters of this fourth claſs, ſee MUSÆ.

Great advances have been made in the knowledge of theſe plants ſince the publications of Linnæus and Juſſieu, whoſe remarks we ſhall therefore paſs over. Swartz, purſuing a path which Haller had in ſome meaſure pointed out, undertook a new arrangement of the *Orchideæ*, chiefly depending on the ſtructure of their anthers. He has publiſhed his ſyſtem in the Upſal and Stockholm Tranſactions, and laſtly, in a more perfect form, in the firſt volume of Schrader's New Journal. Willdenow in his Sp. Pl. v. 4, follows the ſteps of Swartz. We have had frequent occaſion to refer to theſe writers, under genera belonging to the order in queſtion; ſee CYMBIDIUM, DENDROBIUM, DISA, EPIDENDRUM, EPIPACTIS, &c. Mr. Brown, in his Prodr. Fl. Nov. Holl. v. 1. 309, has reviſed the labours of his predeceſſors, corrected ſeveral miſtakes, and thrown much new light on the ſubject, for which the novel productions of New Holland have in this, as in other caſes, afforded him ample opportunity. We ſhall give a ſketch of the characters of the *Orchideæ*, founded chiefly upon his principles, except that we preſume to conſider as a calyx the three outer leaves or ſegments only of the flower, and the two innermoſt, with the lip, or nectary, as corolla. Swartz takes the five leaves for a calyx, the lip only for the corolla.

*Cal.* Perianth ſuperior, permanent, of three leaves, either diſtinct, or more or leſs united at their baſe; the dorſal or uppermoſt often broadeſt and moſt concave, rarely elongated below into a pouch or ſpur; all frequently coloured. *Cor.* Petals two, equal, between the dorſal and lateral leaves of the calyx, and of a ſmaller ſize; their baſe ſometimes elongated into a pouch with that of the lateral calyx-leaves.

Nectary

Nectary a lip, dependent or prominent in front, between the two petals, and inserted in the same row or circle with them, various in shape and colour, undivided or lobed, entire or many-cleft, convex or concave, sometimes bearing honey on its upper surface, often continued at the base into a bag or spur behind the flower, which spur contains the honey, and is in some few instances double. *Stam.* Filaments, according to Mr. Brown, really three, though united more or less completely together by means of the style, or column (as it is technically called) and directed towards the dorsal leaf of the calyx, in opposition to the lip; the two lateral or lowermost of these filaments are, for the most part, abortive, and generally obsolete, being perfect, or bearing anthers, in *Cypripedium* only; the third only in general bearing an anther, and being abortive when the lateral ones are perfect; anther of two cells, its lobes either distant, in which case they are united with the sides of the column, whose summit is frequently elongated beyond them, or they are approximated so as to compose an anther either parallel to the stigma and fixed, or terminating the column in the form of a moveable lid; each cell is very commonly divided internally by a longitudinal partition, which in some few instances is threefold; the pollen coheres in elastic masses, one of them in each cell, and each frequently attaching itself, by an elongated viscid base, to the stigma, or indeed to any thing on which it happens to fall from the anther. *Pist.* Germen roundish, obovate, or elliptical, ribbed, with three principal angles opposite to the three calyx-leaves, of one cell, with three linear parallel receptacles attached to its valves opposite to the petals and lip; style columnar, bearing the anther or anthers, somewhat oblique, sometimes very short; stigma a glandular moist and lucid space, generally in front looking towards the lip, convex or concave, furnished at the top or at the sides with one or two glands, which are either naked, or contained in a pouch or sack, that is sometimes common to both, sometimes double and distinctly appropriated to each; see Ophrys: to these glands the masses of pollen naturally attach themselves when the anther opens. *Peric.* Capsule ovate or inclining to cylindrical, of three valves, often bursting by clefts between the three principal ribs, and cohering at the base and summit. *Seeds* very numerous and minute, each generally enclosed in a membranous tunic, pointed at both ends; but in *Vanilla* they are naked.

The habit of these plants is generally herbaceous, sometimes rather shrubby. *Root* tuberous, often globose, or fibrous, thick and fleshy, perennial. *Stem* simple, rarely branched, either leafy or sheathed. *Leaves* simple, entire, sheathing at the base, alternate, in the branched species, (which are often parasitical,) peculiarly coriaceous and rigid. *Flowers* either spiked, racemose, corymbose, or solitary, rarely panicled; each attended by a *bractea*. *Pubescence*, if present, which is not often the case, simple and acute, sometimes composed of capitate glands. The propagation of these plants by the root is, in fact, like that of the potatoe and other tuberous plants properly so called. Each knob, of the globose and palmate-rooted kinds, flowers but once, and that either the season immediately subsequent to its formation, or several years afterwards; it then withers and decays. Meanwhile a knob for the following year is perfected, just as the former is flowering. The same process appears to take place in some *Orchideæ* with bundles of thick fibres, and perhaps even in the parasitical creeping kinds.

The genera in Linnæus are eight, *Orchis*, *Satyrium*, *Ophrys*, *Serapias*, *Limodorum*, *Arethusa*, *Cypripedium* and *Epipendrum*; to which Jussieu adds *Thelymitra* of Forster, *Disa* of Bergius, *Bipinnula* of Commerson, *Vanilla* of Plumier, and a new genus of his own called *Pogonia*. Swartz does not adopt *Bipinnula* nor *Pogonia*, but he has established several new and, for the most part, very good genera, *Pterigodium*, *Disperis*, *Corycium*, *Neottia*, *Cranichis*, *Epipactis*, *Malaxis*, *Cymbidium*, *Oncidium*, *Aërides*, *Dendrobium*, *Stelis* and *Lepanthes*. Willdenow adopts these, along with *Diuris* of Smith, to which he has added two genera of his own, *Bonatea* and *Habenaria*. Swartz has taken up, from the Flora Peruviana, *Anguloa*, *Gongora* and *Masdevallia*, which Willdenow omits. Brown has the following new genera from New Holland, *Epiblema*, *Orthoceras*, *Cryptostylis*, *Prasophyllum*, *Genoplesium*, *Calochilus*, *Microtis*, *Acianthus*, *Cyrtostylis*, *Chiloglottis*, *Eriochilus*, *Caladenia*, *Lyperanthus*, *Glossodia*, *Pterostylis*, *Corysanthes*, *Caleana*, *Gastrodia*, *Dipodium* and *Sarcochilus*. The last-mentioned author also considers *Epipogium* as a distinct genus; see that article, and many of the rest, in their proper places.

ORCHIDION was a name given by Mitchel to an orchideous genus from Virginia, which Linnæus called *Arethusa*.

ORCHIDOCARPUM, a genus established by Michaux upon the *Annona triloba* of Linnæus, with *pygmæa* and *grandiflora* of Bartram, to which is added a fourth species by the name of *O. parviflorum*. The flower is said to be that of an *Unona* or *Uvaria*, but the fruit consists of several *berries*, by abortion sometimes nearly solitary, sessile, rather large, egg or rather kidney-shaped. *Seeds* several, tunicated, ranged in a simple series along the internal suture. The name applies to the testicular form of the fruit. Mich. Boreali-Amer. v. 1. 329.

ORCHIES, in *Geography*, a town of France, in the department of the North, and chief place of a canton, in the district of Douay; 12 miles S.S.E. of Lille. The place contains 2778, and the canton 13,100 inhabitants, on a territory of 105 kiliometres, in eight communes.

ORCHIL. See Archil.

ORCHILLA, or Horchilla, in *Geography*, a small island in the West Indies, near the coast of South America; or rather a cluster of islands, the largest of which is in the form of a crescent or half moon. These isles are separated from one another by very shallow canals. On the E. and W. capes are some hills, which supply the goats with pasture. On the S.W. side of the main island the water is deep, and the shore is perpendicular, like a wall. The N.W. has scarcely any trees or grass; but on the E. and W. both abound. The soil, from the low land, is salt, and produces few plants. The island has little fresh water, and the only animals upon it are goats and lizards. N. lat. 12°. W. long. 65° 20'.

ORCHIS, in *Botany*, an ancient name, alluding to the testicular shape so frequent and so remarkable in the roots of many species. This resemblance alone seems to have led to the use of these roots, in various ages and countries, as an aphrodisiac or restorative. Linn. Gen. 461. Schreb. 502. Willd. Sp. Pl. v. 4. 8. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 918. Juss. 65. Lamarck Illustr. t. 726. Swartz Act. Holm. for 1800. 205. t. 3. f. A. Schrad. New Journ. v. 1. 6. t. 1. f. A. Brown Prodr. Nov. Holl. v. 1. 312, under *Habenaria*. Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Gen. Ch. *Cal.* Perianth superior, of three spreading leaves; the uppermost vaulted. *Cor.* Petals two, often approximated or attached to the upper leaf of the calyx. Nectary a spreading lip, with a tubular spur behind. *Stam.* Anther large, oblong, erect, attached in a parallel manner to the summit of the style, of two cells, opening in front; the masses of pollen club-shaped, attaching themselves, each

by

by its taper baſe, to one or two glands by the ſtigma, in one and the ſame pouch; ſtyle columnar, ſhort; ſtigma below the anther, convex, oblique. *Peric.* Capſule oblong, with three ribs, of one cell and three valves, ſplitting by three lateral fiſſures. *Seeds* numerous, minute, each with a chaffy tunic.

Eſſ. Ch. Upper leaf of the calyx vaulted. Lip of the nectary with a poſterior ſpur. Anther terminal, parallel. Maſſes of pollen ſtalked, their baſes approximated within a ſimple pouch.

The vaſt genus of *Orchis*, as it ſtands in Swartz and Willdenow, is now much curtailed by Mr. Brown, who excludes from it all the ſpecies that have not a ſimple pouch containing the baſes of both the maſſes of pollen together. Theſe are ſeparate, each with its own pouch, in *Ophrys*, (which beſides has no ſpur to the flower,) and ſeparate, without any pouch, which, ſo underſtood, becomes a large and very natural genus. The true *Orchis*, thus defined, is ſcarcely found out of Europe, one ſpecies only being known in America, none in the ſouthern hemiſphere, nor between the tropics. What Mr. Brown has found anſwering to this character are *O. morio*, Engl. Bot. t. 2059; *maſcula*, t. 631; *paluſtris*, Jacq. Ic. Rar. t. 181. Willd. n. 41; *uſtulata*, Engl. Bot. t. 18; *militaris*, t. 1873; *fuſca*, Jacq. Auſtr. t. 307, which was firſt publiſhed as *militaris* in Engl. Bot. t. 16; *papilionacea*, Linn. Sp. Pl. 1331, of which *rubra*, Jacq. Ic. Rar. t. 183. ſeems to us a variety; *palleus*, Jacq. Auſtr. t. 45; *coriophora*, Linn. Sp. Pl. 1332. Jacq. Auſtr. t. 122; *odoratiſſima*, Linn. Sp. Pl. 1335. Jacq. Auſtr. t. 264; *ſpectabilis*, Linn. Sp. Pl. 1337, found in North America; *ſambucina*, Linn. Sp. Pl. 1334. Jacq. Auſtr. t. 108; *pyramidalis*, Engl. Bot. t. 110; *hircina* (*Satyrium*) t. 34; *globoſa*, Linn. Sp. Pl. 1332. Jacq. Auſtr. t. 265; *latifolia*, Engl. Bot. t. 2308; and *maculata*, t. 632. We have here referred to Engl. Bot. only for ſuch ſpecies as are Britiſh. Mr. Brown ſuggeſts that there are Orchideous plants of European growth, eſpecially with purple flowers, that unqueſtionably belong to the preſent genus. Of the Britiſh ones beſides referred to it by Swartz, *Orchis bifolia*, Engl. Bot. t. 22; *Satyrium viride*, t. 94; and *albidum*, t. 505; are conſidered by Mr. Brown as *Habenariæ*.—*Orchis conopſea*, Engl. Bot. t. 10, though it has all the habit and general characters of a true *Orchis* as defined above, has no pouch at all for the maſſes of pollen, which are inſerted, as in *Habenaria*, into two naked glands, but they are approximated as in *Orchis*. Hence Mr. Brown, in the new edition of Ait. Hort. Kew. publiſhed under his care, has eſtabliſhed this plant as a new genus, called *Gymnadenia*, in alluſion to theſe naked glands.—The ſpecies of *Orchis* are found, ſome of them copiouſly in meadows or moiſt groves, others more partially and ſparingly on dry chalky hills. They flower in June or July, and are moſtly beautiful, ſome of the kinds very richly ſcented.

Orchis, in *Gardening*, contains plants of the herbaceous, bulbous-rooted, flowery perennial kind, of which the ſpecies cultivated are; the butterfly orchis (O. bifolia); the female or meadow orchis (O. morio); the male or early ſpotted orchis (O. maſcula); the man orchis (O. militaris); the broad-leaved or marſh orchis (O. latifolia); the ſpotted orchis (O. maculata); the long-ſpurred orchis (O. conopſea); and the purple bird's-neſt, or bird's-neſt orchis, (O. abortiva).

The ſecond ſort has varieties with purple flowers, with red flowers, with violet flowers, with fleſh-coloured flowers, and with white flowers.

The fourth ſpecies has alſo ſeveral varieties.

In the fifth there are different varieties.

And the ſixth varies with purple flowers, red flowers, and white flowers.

*Method of Culture.*—Theſe curious plants may all be introduced and preſerved in the pleaſure-grounds, by proper care in removing them from their native ſituations, which ſhould always be done when their leaves decline, being previouſly marked. When removed at other ſeaſons, they ſeldom ſucceed. They ſhould be taken up with balls of earth about their roots, and be immediately replanted, in a ſoil and ſituation as nearly as poſſible the ſame as that from which they were taken. When thus managed, they continue many years flowering in a ſtrong manner.

They afford much variety where the different kinds are in the borders, and other parts, in a proper manner.

Orchis-*Root*, in the *Materia Medica*, is otherwiſe named *ſalep*, vulgarly called *ſaloop*. See Salep.

ORCHAMENO, in *Geography*, a town of European Turkey, in the Morea, anciently "Orchamenus;" 25 miles W. of Argo.

ORCHOMENE, in *Ancient Geography*, a name by which ſeveral towns are diſtinguiſhed. Homer, in ſpeaking of that of Bœotia, gives it the epithet of Μινυειον, or Minyan; thus diſcriminating between this and another town of the ſame name in Arcadia. According to Pauſanias, Orchomene had been one of the moſt conſiderable towns of Greece. The Orchomenians appear by Homer's account to have been very powerful at the time of the Trojan war. When the ſons of Cadmus emigrated into Ionia, in order to eſtabliſh colonies, the Orchomenians took part in their expedition. Their power excited the jealouſy of the Thebans, who drove them from their town; and though they were re-eſtabliſhed by Philip, the father of Alexander, their condition was always feeble and declining. At Orchomene, among other objects of curioſity, were a temple of Bacchus, a temple conſecrated to the Graces, and a building called the treaſury of Minyas. Here were alſo the tomb of Minyas and that of Heſiod.—Alſo, a town of Arcadia, a little N.W. of Mantinæa. This town contained, among other monuments, two temples, one of Neptune, and another of Venus, and theſe divinities were repreſented in marble.

ORCHOTOMIA, from ορχις, *teſticle*, and τεμνω, *to cut*, in *Surgery*, the operation of removing the teſticle: caſtration.

ORCI Nuovo, in *Geography*, a fortreſs of Italy, in the department of the Mela, on the Oglio, built by the Venetians for the defence of their territories from the Spaniards, who were at that time in poſſeſſion of the Milaneſe; 15 miles S.W. of Breſcia.

Orci *Vecchia*, a town of Italy, in the department of the Mela; 14 miles S.W. of Breſcia.

ORCIANO, a town of Italy, in the duchy of Urbino; 16 miles S.E. of Urbino.—Alſo, a town of Etruria; 7 miles E. of Leghorn.

ORCIATICO, a town of Etruria; 8 miles W. of Volterra.

ORCIE'RES, a town of France, in the department of the Higher Alps, and chief place of a canton, in the diſtrict of Embrun; 9 miles N.W. of it. The place contains 1145, and the canton 2352 inhabitants, on a territory of 362½ kiliometres, in 3 communes.

ORCINO, a town of the department of Liamone, or the iſland of Corſica, and diſtrict of Ajaccio. The number of inhabitants in the canton is 2780.

ORCO, a river of Piedmont, which runs into the Po, near Chivazzo.

ORD *of Caithneſs*, a cape of Scotland, on the S.E. coaſt of the county of Caithneſs. N. lat. 58° 7'. W. long. 3° 28'.

ORDAVAR,

ORDAVAR, a town of Perſian Armenia; 50 miles S.E. of Naeſivan.

ORDEAL, Ordalium, a form of trial, that is, of diſcovering innocence or guilt; practiſed in England in the time of Edward the Confeſſor: and ſince, as low as king John and king Henry III.

The word, in the original Saxon, ſignifies *a great judgment*, formed of *or*, *great*, and *deal*, or *dele*, *judgment*.

It was called *purgatio vulgaris*, or *judicium Dei*, in oppoſition to *bellum* or *combat*, the other form of purgation: and alſo to the canonical purgation, which was by the oath of the party.

The ordeal was of various kinds; *viz.* that of fire, that of red-hot iron, that of cold water, that of judicial pottage, that of hallowed cheeſe, that of boiling water, that of a croſs, and that of dice laid on relics, covered with a woollen cloth. There were particular maſſes for each ſpecies of ordeal. See Corsned, and *Judgment of the* Cross.

The more popular kinds of ordeal were thoſe of red-hot iron and water: the firſt for freemen and people of faſhion; the ſecond for peaſants.

Fire-ordeal was performed either by taking up in the hand, unhurt, a piece of red-hot iron, of one, two, or three pounds weight; or elſe by walking, barefoot and blindfold, over nine red-hot plough-ſhares, laid lengthwiſe, at unequal diſtances; and if the party eſcaped without injury, he was adjudged innocent; but if it happened otherwiſe, as without colluſion it generally did, he was then condemned as guilty. The former was conducted in this manner: a ball of iron was prepared, of one, two, or three pounds weight, according to the nature of the accuſation. When all the prayers and other religious ceremonies were finiſhed, this ball was put into a fire, and made red-hot; after which it was taken out. The priſoner having ſigned himſelf with the croſs, and ſprinkled his hand with holy water, took the ball of hot iron in his hand, and carried it to the diſtance of nine feet; after which his hand was put into a bag, and ſealed up for three days; at the expiration of which it was examined, in the preſence of twelve perſons of each party. If any marks of burning appeared upon it, the accuſed was found guilty; if none, he was declared innocent. Ducange Gloſs. Voc. *Ferrum Candens*.

It is a popular ſtory in our hiſtories, that Emma, mother of Edward the Confeſſor, being accuſed of too much familiarity with Alwyn, biſhop of Wincheſter, demanded the ordeal of red-hot iron; and paſſed barefooted and hoodwinked over nine red-hot plough-ſhares, without touching any of them.

Water-ordeal was performed either by plunging the bare arm up to the elbow in boiling water, and eſcaping unhurt; or by caſting the perſon ſuſpected into a river or pond of cold water, and if he floated therein, without any action of ſwimming, it was deemed an evidence of his guilt, but if he ſunk he was acquitted.

The preparations by faſtings, prayers, and other religious exerciſes, were the ſame for both theſe ordeals. In the hot-water ordeal, the perſon to be tried was conducted with great ſolemnity to the church, where the prieſt began by ſaying certain prayers ſuitable to the occaſion; after which maſs was celebrated; and before the accuſed was permitted to communicate, he was adjured, in the moſt awful form of words, to confeſs if he was guilty. Fire was then kindled under a pot filled with water; and while the water was heating, the prieſt ſaid many prayers compoſed for that purpoſe. As ſoon as the water began to boil, a ſtone was ſuſpended in it by a ſtring, at the depth of one, two, or three palms, according to the nature of the accuſation. The pot was then taken down and placed by the ſide of the fire; and the priſoner having ſaid the Lord's prayer (not very rapidly we may preſume), and marked himſelf with the ſign of the croſs, plunged his naked hand and arm into the water, and ſnatched out the ſtone. His arm was inſtantly wrapped in linen cloths, and put into a bag, which was ſealed by the judge in the preſence of the ſpectators. The priſoner was then reſtored to the prieſt, who produced him in the ſame church at the end of three days; when the bag was opened, the bandages taken off, and the arm examined by twelve of his own friends, and twelve of the friends of the proſecutor. If any marks of ſcalding then appeared upon the arm, the priſoner was found guilty: if no ſuch marks could be diſcovered, he was acquitted. Ducange Gloſſ. apud. Voc. *Aquæ ferventis judicium*.

The ordeal by cold water was thus conducted: the perſon who was tried was put under the direction of a ghoſtly father, of great reputation for his ſanctity, who obliged him to perform many extraordinary acts of devotion, and to keep a rigorous faſt for three days. When this faſt was ended, and the day appointed for the trial came, the priſoner was publicly conducted to the church, where the prieſt celebrated maſs; and before he permitted the accuſed to communicate, he addreſſed him in the following ſolemn ſtrain: "I adjure thee, O man, by the Father, Son, and Holy Ghoſt, by the true Chriſtianity which you profeſs, by the only begotten Son of God, by the holy Trinity, by the holy Goſpel, and by all the holy relics in this church, that you do not preſume to communicate, or approach this holy altar, if you have committed this crime, conſented to it, or know who committed it." If the priſoner made no confeſſion, the prieſt gave him the communion, ſaying, "Let this body and blood of our Lord Jeſus Chriſt be received by you as a probation this day." After this a quantity of holy water was conſecrated, and then the whole company left the church, and went in proceſſion to the pool where the ordeal was to be performed. When they arrived there, the prieſt gave the priſoner a draught of the holy water, ſaying, "Let this holy water be to thee a probation this day." If the priſoner ſtill continued to deny his guilt, the prieſt then pronounced a long and very fervent prayer over the pool, adjuring it by every thing that was divine and venerable in heaven or on earth, that if the perſon to be thrown into it was guilty, it would reject him, and cauſe him to float upon its ſurface; but if he was innocent, that it would receive him into its boſom. The priſoner was then ſtripped naked, his hands and legs made faſt, and a rope tied about his middle, with a knot upon it, at the diſtance of a yard and half from his body, and thrown into the pool. If he floated, which was hardly to be expected, he was taken out, and declared guilty; if he ſunk ſo deep as to carry the knot of the rope under water, he was inſtantly pulled out, before he could receive any injury. Muratori Antiq. t. 3. Wilkins's Leg. Saxon, p. 61.

This ordeal was evidently a very uncertain teſt of guilt or innocence; but the great ſolemnity with which it was adminiſtered, might ſometimes ſtrike terror into the minds of criminals, and bring them to confeſſion. In this ordeal it is preſumed that God would work a miracle for the detection of guilt: in the ordeals of hot water and hot iron, the preſumption was, that he would work a miracle for the vindication of innocence: but for either of theſe preſumptions there was no ſolid foundation.

It is eaſy to trace out the traditional relics of this water-ordeal, in the ignorant barbarity ſtill practiſed in many countries, to diſcover witches, by caſting them into a pool of water, and drowning them to prove their innocence. This

purgation by ordeal ſeems to have been very ancient, and very univerſal, in the time of ſuperſtitious barbarity. It was known to the ancient Greeks, vide Antigone of Sophocles, v. 270. And Grotius Com. on Numb. v. 17. gives many inſtances of water-ordeal, in Bithynia, Sardinia, and other places.

It was very anciently known in Perſia, and perhaps originated from their ſuperſtitious veneration for fire. Records of trial by ordeal remain above 500 years before the Chriſtian era. It is ſtill in practice, where ſatisfactory evidence cannot be obtained, among the Gentoos, in Hindooſtan, and of very high antiquity. It is mentioned ſeveral times in the code of Gentoo laws, as a common mode of proof. The modes of this ordeal are various in India, according to the choice of the party, or nature of the offence; but the infallibility of the reſult is to this day as implicitly believed, as it could have been in the darkeſt ages of antiquity. See chap. iii. of the Code of Gentoo Laws, by Halhed.

The moſt reſpectable authors, ancient and modern, attribute the invention of water-ordeal, in the Chriſtian church, to pope Eugenius II.; though Le Brun, a prieſt of the Oratory, maintains, that it was more ancient. However this be, the cuſtom was condemned and abrogated, by the authority of Lewis the Meek, about the year 829. It was afterwards revived, and practiſed in the 10th, 11th, and 12th centuries.

The firſt account we have of Chriſtians appealing to the fire-ordeal, as a proof of their innocence, is that of Simplicius, biſhop of Autun, who lived in the 4th century. This prelate, as the ſtory is related, before his promotion to the epiſcopal order, had married a wife, who loved him tenderly, and who, unwilling to quit him after his advancement, continued to ſleep in the ſame chamber with him. The ſanctity of Simplicius ſuffered, at leaſt in the voice of fame, by the conſtancy of his wife's affection: and it was rumoured about, that the holy man, though a biſhop, perſiſted, in oppoſition to the eccleſiaſtical canons, to taſte the ſweets of matrimony; upon which, his wife, in the preſence of a great concourſe of people, took up a conſiderable quantity of burning coals, which ſhe held in her clothes, and applied to her breaſts, without the leaſt hurt to her perſon or her garments, as the legend ſays, and her example being followed by her huſband, with the like ſucceſs, the ſilly multitude admired the miracle, and proclaimed the innocence of the loving pair. A ſimilar trick was played by St. Brice, in the fifth century. Moſh. Eccl. Hiſt. vol. ii. 1768.

The practice of ordeal obtained very generally in more modern times; and even in England ſo late as king John's time, we find grants to the biſhops and clergy to uſe the *judicium ferri, aquæ, et ignis*. And both in England and Sweden, the clergy preſided at this trial, and it was only performed in the churches or in other conſecrated ground. However, the canon law declared very early againſt trial by ordeal, as being the fabric of the devil. Upon this authority, though the canons themſelves were of no validity in England, it was thought proper (as had been done in Denmark, above a century before,) to diſuſe and aboliſh this trial entirely in our courts of juſtice, by an act of parliament of 3 Hen. III. according to ſir Edward Coke, or rather by an order of the king in council. Blackſt. Com. vol. iv.

If we imagine that few or none eſcaped conviction, who expoſed themſelves to theſe ordeals, we ſhall be much miſtaken: for the hiſtories of thoſe times in which they were in uſe contain innumerable examples of perſons plunging their naked arms into boiling water, handling red-hot balls of iron, and walking upon burning plough-ſhares, without receiving the leaſt injury. (Ducange Gloſſ. t. iii. p. 399, &c.) Several learned men have been much puzzled to account for this, and have been diſpoſed to think that Providence graciouſly interpoſed in a miraculous manner for the preſervation of injured innocence. But upon examining every circumſtance of theſe ordeals with due attention, we ſhall perceive reaſon ſufficient to ſuſpect that the whole was a groſs impoſition on the credulity of mankind. The accuſed perſon was committed wholly to the prieſt who was to perform the ceremony, three days before the trial, in which he had time enough to bargain with him for his deliverance, and give him inſtructions how to act his part. On the day of trial, no perſon was permitted to enter the church but the prieſt and the accuſed, till after the iron was heated; when twelve friends of the accuſer and twelve friends of the accuſed, and no more, were admitted, and arranged along the wall on each ſide of the church, at a reſpectful diſtance. After the iron was taken out of the fire, ſeveral prayers were ſaid, the accuſed drank a cup of holy water, and ſprinkled his hand with it, which, if the prieſt was indulgent, might take a conſiderable time. The ſpace of nine feet was meaſured by the accuſed himſelf with his own feet, and he would probably give but ſcanty meaſure. He was obliged only to touch one of the marks with the toe of his right foot, and allowed to ſtretch the other foot as far towards the other mark as he could: ſo that the conveyance was almoſt inſtantaneous. His hand was not immediately examined, but wrapped in cloth, prepared for that purpoſe, three days. From all theſe precautions may we not ſuſpect that theſe prieſts were in poſſeſſion of ſome ſecret that ſecured the hand from the impreſſions of ſuch a momentary touch of hot iron, or removed all appearance of theſe impreſſions in three days; and that they made uſe of this ſecret when they ſaw reaſon? Moreover, we meet with no example of any champion of the church, who ſuffered the leaſt injury from the touch of hot iron in this ordeal; but when any one was ſo fool-hardy as to appeal to this, or to that of hot water, with a view to deprive the church of any of her poſſeſſions, he never failed to burn his fingers, and loſe his cauſe. Ducange Gloſſ. t. iii. Henry's Hiſt. vol. iii.

ORDEFF, or OREDEF, a word frequently uſed, in charters of privileges, for a liberty whereby a man claims the ore found in his own ground.

It properly ſignifies ore lying under ground; as a *delf* or *deff of coal* is coal lying in veins under ground.

ORDER, in *Architecture*. The word order is equivalent to arrangement, and in architecture may be conſidered as a decorated imitation of ſuch a portion of a primitive hut, of a certain conſtruction, as might comprehend the whole deſign by a continuity and repetition of its parts. The hut originally conſiſted of a roof or covering, ſupported by poſts made of the trunks of trees, in four rows, forming a quadrangular enclоſure. Beams were laid upon the tops of the poſts, in order to connect them, in their longitudinal direction, in one body. To ſupport the covering, timbers were laid from beam to beam acroſs the breadth; and to throw off the wet, other beams were laid parallel to thoſe reſting upon the poſts, but jutting farther over on each ſide of the edifice: and theſe again ſupported inclined timbers which overhung their ſupports, and formed a ridge in the middle of the roof for throwing off the wet; and thus the part ſupported formed three principal diſtinct portions, which, in proceſs of time, were decorated with certain mouldings, or other ornaments, each part ſtill preſerving its diſtinct maſs, though perhaps not exactly ſimilar

to the original form. The three parts, taken as a whole, were called the entablature: the lower part, conſiſting of the linteling beams, was called the epiſtyle, or architrave; the middle part, which receded from the epiſtyle, was called the zoophorus, or frieze; and the upper part, which projected conſiderably over the epiſtyle, being in imitation of the ends of the roof, was called the cornice.

Therefore the entablature conſiſts of a cornice, frieze, and architrave.

The poſts received the name of columns, which always conſiſt of two principal diviſions at leaſt, and frequently of three. The columns were ornamented at the top in imitation of the ſtones laid upon the poſts in the original wooden hut, for throwing off the rain. Theſe decorations at the top received the name of capital, and each of the wooden poſts, that of ſhaft.

When ornaments were added to the foot of the ſhaft they were termed the baſe.

The order, therefore, conſiſts principally of a column and entablature. The column is ſubdivided into a ſhaft and capital, or, at moſt, into three principal parts, a baſe, ſhaft, and capital; and the entablature, as has been obſerved, into architrave, frieze, and cornice. Theſe parts are again divided into ſmaller portions, termed mouldings, or other ornaments.

There are three orders in architecture, though the modern writers generally enumerate five, but without any authority. Theſe three orders are named Doric, Ionic, and Corinthian, according to the place in which they were invented.

Their hiſtory according to Vitruvius, is detailed under the article CIVIL *Architecture*.

Except in the general forms above ſpecified, there is no ſtandard of proportion common to the three orders, each having its own ſymmetry. The capitals are their diſtinguiſhing features. The Doric entablature is peculiar to the Doric. The Ionic entablature may be applied to the Corinthian with equal propriety, as the remains of Grecian antiquity amply teſtify. The proportions of columns vary in the three orders, from five to ten diameters, the ſtandard being the diameter of a ſection of the ſhaft at the bottom. The ſhafts of the columns are the fruſtums of cones; they are ſometimes of a conoidal form, which however is not ſo agreeable to the archetype as the conic fruſtum, and in the antique they are generally fluted. The fluting of the Doric is peculiar to itſelf. The columns of this order are in height fewer diameters than thoſe of the other two; and ſuppoſing the diameter at the baſe in the three orders to be equal, the altitudes of the columns will increaſe from the Doric to the Corinthian, ſo that the Ionic column is the medium between the other two. The height of the entablature of each order may be generally ſtated at two diameters of its column. The diminution of the ſhafts is not equal in all the orders: that of the Doric varies from one-fourth to one-fifth, the Ionic and Corinthian from one-fifth to one-ſixth. Neither are the cornice, frieze, or architrave in an equal ratio to each other. The height of the Doric cornice is about one-fourth of the height of the entablature; that of the Ionic one-third, and in moſt examples conſiderably more. The height of the architrave and that of the frieze of the Doric entablature are, in general, equal. In the Ionic and Corinthian the architrave is higher than the frieze, but of leſs height than the cornice. Though the moderns have claſſed two other orders with the three Grecian, they have no authority for this addition. Vitruvius mentions Tuſcan temples and various kinds of capitals uſed for the Corinthian, but no where ſpeaks of them as forming a diſtinct order. The peculiarities of each are noticed under its reſpective title; ſee DORIC, IONIC, and CORINTHIAN *Order*. See alſo COMPOSITE and TUSCAN *Order*.

ORDER, *Attic*. See ATTIC.

ORDER, *Caryatic*. See CARYATIDES.

ORDER, *French*, is a new-contrived order, wherein the capital conſiſts of attributes agreeing to that people, as cocks' heads, fleur de lis, &c.

Its proportions are Corinthian. Such is that of M. Le Brun, in the grand gallery at Verſailles; and that of M. Le Clerc.

M. Le Clerc gives a ſecond Tuſcan order, and a Spaniſh order, beſides his French order. The Tuſcan he ranks between the firſt Tuſcan and Doric. Its height he makes 23 ſemidiameters 22 minutes; the column to have 15, the pedeſtal 5, and the entablature 3, and 22 minutes: and he propoſes its frieze to be adorned with turtles, which are the arms of Tuſcany.

The Spaniſh order he places between the Corinthian and Compoſite. The whole order he makes 30 ſemidiameters, 28 minutes; of which the column has 9 and 25 minutes, the pedeſtal 16 and 18 minutes, and the entablature 4 and 15 minutes. The horns of the abacus he ſuſtains with little volutes; the middle, in lieu of a roſe, has a lion's ſnout; that animal being the ſymbol of Spain, and expreſſing the ſtrength, gravity, and prudence of that nation.

There has been alſo an order, where lions and unicorns have been made to iſſue from the volutes, in compliment to the arms of the king of England, and called the *Britannic* order; but all theſe diſtinctions are alterations without improvement, and encumber rather than ornament the original figure of the antique capital.

ORDERS, *Greek*. See GREEK.

ORDER, *Gothic*. See GOTHIC.

ORDER, *Perſian*. See PERSIAN.

In ſome caſes the caryatides, or Perſian order, is introduced as an attic, over columns; as in the front of the Royal Academy, in the Strand.

ORDER, *Ruſtic*. See RUSTIC.

ORDER, in *Aſtronomy*, &c. A planet is ſaid to go according to the order of the ſigns, when it is direct; proceeding from Aries to Taurus, thence to Gemini, &c.—It goes contrary to the order or ſucceſſion of the ſigns, when it is retrograde; *i. e.* when it goes back from Piſces to Aquarius, &c.

ORDERS, in *Syſtematical Botany*, are uſually ſubdiviſions of claſſes. The orders of Tournefort are diſtinguiſhed by the fruit; thoſe of Linnæus moſtly by the number of ſtyles, at leaſt in his firſt thirteen claſſes; thoſe of the 14th and 15th are diſcriminated by the fruit; of the 16th, 17th, and 18th, by the number of the ſtamens, which is likewiſe the caſe in the 20th, 21ſt, and 22d claſſes; the orders of the 19th claſs being characteriſed by the nature of the florets, while the orders of the 24th *Cryptogamia* are natural aſſemblages. See CLASSIFICATION and NATURAL *Orders*.

ORDERS, in *Law*, are of ſeveral ſorts, and by divers courts; as of the chancery, king's bench, &c. Orders of the court of chancery, either of courſe or otherwiſe, are obtained on the petition or motion of one of the parties in a cauſe, or of ſome other intereſted in, or affected by it; and they are ſometimes made upon hearing, and ſometimes by conſent of parties. Pract. Solic. 26.

ORDERS, in a *Military Senſe*, denote all that is lawfully commanded by ſuperior officers. Thus, orders are given out every day, whether in camp, garriſon, or on a march, by the commanding officer; which orders are afterwards

given to every officer in writing by their reſpective ſerjeants.

The orders of the commander-in-chief are thoſe which iſſue directly from his office, for the government of the army at large, or for any ſpecific purpoſe. Theſe orders are ſanctioned by the king, and are irrevocable elſewhere.

*General orders* are ſuch as are given by the general who commands; who iſſues them in writing to the adjutant-general, and he ſends exact copies of them to the general officers of the day, and diſtributes them at his own quarters to all the brigade-majors, who daily go to head-quarters for that purpoſe, where they write down every thing that is dictated to them; and from thence they go and communicate the orders at an appointed place to the different majors or adjutants of the regiments which compoſe that brigade: they firſt read them to their colonels and lieutenant-colonels, or majors, and they dictate them to the ſerjeants of companies, and this is done by the ſerjeant-major, who writes them correctly down in their orderly books, and brings them to all the officers belonging to the company.

There are alſo *garriſon*, *brigade*, *regimental*, *ſtanding*, &c. orders.

ORDER, in *War*, denotes an arrangement of the parts of an army, either by land or ſea, whether for marching, failing, or engaging.

ORDER *of Battle*. See BATTLE and LINE.

*An* ORDER *of March* is diſpoſed in two or three columns, according to the ground. The orders and evolutions make the ſubject of the ſcience of tactics. See EVOLUTION and MARCH.

ORDER is more particularly uſed for the equal diſtance of one rank or file from another.

The uſual order in files is three feet; in ranks ſix feet. The open or marching order is twice as much. See MARCH.

ORDER, *Cloſe*, *Open*, &c. See BATTALION.

ORDER, in *Rhetoric*, is the placing of each word and member of a ſentence in ſuch a manner, as will moſt contribute to the force, beauty, or evidence of the whole; according to the genius and cuſtom of different languages. With regard to order, we may obſerve in general, that, in Engliſh, the nearer we keep to the natural or grammatical order it is generally the beſt; but in Latin, we are to follow the uſe of the beſt writers; a joint regard being always had to the judgment of the ear, and the perſpicuity of the ſenſe, in both languages. See DISPOSITION.

ORDER is alſo uſed for a claſs or diviſion of the members of the body of a ſtate; with regard to aſſemblies, precedence, &c.

In this ſenſe, order is a kind of dignity, which, under the ſame name, is common to ſeveral perſons; and which, of itſelf, does not give them any particular public authority, but only rank, and a capacity of arriving at honours and employments.

To abridge this definition, order may be ſaid to be a dignity attended with an aptitude for public employ. By which it is diſtinguiſhed from an office, which is the exerciſe of a public truſt.

In this ſenſe, nobility is an order, &c. The clericate is alſo an order, &c.

ORDER is alſo the title of certain ancient books, containing the divine office, with the order and manner of its performance.

Roman order is that in which are laid down the ceremonies which obtain in the Romiſh church. See RITUAL.

ORDERS, by way of eminence, or *holy* orders, denote a character peculiar to eccleſiaſtics, whereby they are ſet apart for the miniſtry.

This the Romaniſts make their ſixth ſacrament.

In the reformed churches there are but three orders; *viz.* biſhops, prieſts, and deacons. In the Romiſh church there are ſeven, excluſive of the epiſcopate: all which the council of Trent enjoins to be received, and believed, on pain of anathema.

They are diſtinguiſhed into *petty*, or *ſecular* orders; and *major*, or *ſacred* orders.

ORDERS, *the petty*, or *minor*, are four; *viz.* thoſe of doorkeeper, exorciſt, reader, and acolyth.

Thoſe in petty orders may marry without any diſpenſation: in effect, the petty orders are looked on as little other than formalities, and as degrees neceſſary to arrive at the higher orders. Yet the council of Trent is very ſerious about them: enjoins that none be admitted into them without underſtanding Latin: and recommends it to the biſhops, to obſerve the intervals of conferring them, that the perſons may have a ſufficient time to exerciſe the function of each order: but it leaves the biſhops a power of diſpenſing with thoſe rules. ſo that the four orders are uſually conferred the ſame day, and only make the firſt part of the ceremony of ordination.

The Greeks diſavow theſe petty orders, and paſs immediately to the ſub-diaconate; and the reformed to the diaconate.

Their firſt riſe Fleury dates in the time of the emperor Juſtinian. There is no call nor benefice required for the four petty orders; and a baſtard may even enjoy them without any diſpenſation; nor does bigamy diſqualify.

ORDERS, *Sacred*, or *Major*, we have already obſerved, are three; *viz.* thoſe of deacon, prieſt, and biſhop.

The council of Trent, retrieving the ancient diſcipline, forbids any perſon being admitted to the major orders, unleſs he be in peaceable poſſeſſion of a benefice ſufficient for a decent ſubſiſtence: allowing no ordinations on patrimonies or penſions: except where the biſhop judges it for the ſervice of the church.

A perſon is ſaid to be promoted to orders *per ſaltum*, when he has not before paſſed the inferior orders. The council of Conſtantinople forbids any biſhop being ordained without paſſing all the degrees; yet church hiſtory furniſhes us with inſtances of biſhops conſecrated, without having paſſed the order of prieſthood; and Panormus ſtill thinks ſuch an ordination valid.

ORDERS, *Military*, are companies of knights, inſtituted by kings and princes; either for defence of the faith, or to confer marks of honour, and make diſtinctions among their ſubjects.

There have been five orders, purely military, in England; *viz.* thoſe of the knights of the Garter, knights Bannerets, knights of the Bath, knights Bachelors, and knights Baronets.

The French have had five military orders; *viz.* that of the Genette, inſtituted by Charles Martel; but which ſoon fell. The order of the Virgin Mary, ſince called the order of the Star, inſtituted by king John, in 1352. The order of St. Michael, inſtituted in 1469, by Lewis IX. The order of the Holy Ghoſt, or the Blue Ribband; the members of which are firſt to be knights of St. Michael. And the order of St. Louis, inſtituted by Louis XIV., in 1693. The princes of the blood, marſhals of France, admirals, and generals, become knights of St. Louis by their offices.

ORDER *of Alcantara*, *of Amaranth*, *of Argonauts*, *of the Band of Calatrava*, *of Chriſt*, *of the Croſs*, *of the Elephant*, *of the Ermine*, *of the Golden Fleece*, *of St. James*, *of the Knot*, *of St. Lazarus*, *of the Roſary*, *of the Star*, *of the*

*the Stole, and of the Thiſtle*, &c. See the reſpective articles. See the references under KNIGHTS.

ORDER *of Merit*. See MERIT.

ORDER *of St. Alexander Newſki*, or the red ribband, was inſtituted by Peter I., emperor of Ruſſia; but the czarina Catherine I. conferred it in the year 1725. See ALEXANDER NEVSKOI.

ORDERS, *Religious military*, are thoſe inſtituted in defence of the faith, and privileged to ſay maſs; and who are prohibited marriage, &c.

Of this kind are the knights of Malta, or of St. John of Jeruſalem. Such alſo were the knights Templars, the knights of Calatrava, knights of St. Lazarus, Teutonic knights, &c. See MALTA, TEMPLAR, &c.

Father Putignani accounts thoſe military orders where marriage is not allowed, real religious orders. F. Papebroch ſays, it is in vain to ſearch for military orders before the twelfth century.

ORDERS, *Religious*, are congregations, or ſocieties of monaſtics, living under the ſame ſuperior, in the ſame manner, and wearing the ſame habit.

Religious orders may be reduced to five kinds; *viz.* monks, canons, knights, mendicants, and regular clerks. See MONK, CANON, &c.

Father Mabillon ſhews, that till the ninth century, almoſt all the monaſteries in Europe followed the rule of St. Benedict; and that the diſtinction of orders did not commence till upon the re-union of ſeveral monaſteries into one congregation: that St. Odo, abbot of Cluny, firſt began this reunion, bringing ſeveral houſes under the dependence of Cluny: that, a little afterwards, in the eleventh century, the Camaldulians aroſe; then, by degrees, the congregation of Vallombroſa; the Ciſtercians, Carthuſians, Auguſtines: and at laſt, in the thirteenth century, the Mendicants. He adds, that Lupus Servatus, abbot of Ferrieries in the ninth century, is the firſt that ſeems to diſtinguiſh the order of St. Benedict from the reſt, and to ſpeak of it as a particular order.

*White* order denoted the order of regular canons of St. Auguſtine. See AUGUSTINS.

*Black* order denoted the order of Benedictines.

Theſe names were firſt given theſe two orders from the colour of their habit; but are diſuſed ſince the inſtitution of ſeveral other orders, who wear the ſame colours.

*Grey* order was the ancient name of the Ciſtercians; but ſince the change of the habit, the name ſuits them no more.

ORDER *of Charity*. See CHARITY.

ORDER *of St. Saviour*. See SAVIOUR.

ORDER, *Third*. See THIRD.

ORDER, in the *Geometry of Curves*. See GENDER, LINE, and CURVE.

ORDERS, *Book of*. See BOOK.

ORDER, *Interlocutory*. See INTERLOCUTORY.

ORDERIC, VITAL, in *Biography*, an eccleſiaſtical hiſtorian in the twelfth century, of French extraction, but born in England about the year 1075. When he was eleven years old he was ſent to Normandy, where he took the religious habit in the abbey of Ouche, and in 1091, he was ordained ſubdeacon. It was not till 1108, when he was in his thirty-third year, that he received prieſts' orders from the hands of the archbiſhop of Rouen. He paſſed his life wholly occupied in ſtudy and devotion, without filling any of the poſts belonging to his order. He died in 1143. As an author he is known by a work entitled "Hiſtoriæ Eccleſiaſticæ, lib. xiii." containing the hiſtory of the Chriſtian church, from the birth of Chriſt to the year 1142. This work is ſaid to furniſh many intereſting facts, not to be met with elſewhere, which relate to the hiſtories of Normandy, of France, and England. It was firſt edited by Ducheſne, among his "Hiſtoriæ Normannorum Scriptores." Gen. Biog.

ORDERLY SERJEANT, and *Orderly Men*, in *Military Language*, are thoſe who are appointed to attend on general officers, or ſuch other officers as are entitled to ſuch, who walk behind them with their arms.

ORDERLY *Book*, is a book provided for every company, in which the ſerjeants write down both general and regimental orders, that the officers may read them.

ORDIK, in *Geography*, a town of European Turkey, in Beſſarabia; eight miles N. of Iſmael.

ORDINAL, ORDINALE, a book containing the order or manner of performing divine ſervice; and ſeems to be the ſame with that which was called the "pie" or "portuis," and ſometimes "portiforium." See RITUAL.

ORDINAL, in *Grammar*, an epithet given to ſuch numbers as mark the order of things, or in what rank they are placed.

Thus, firſt, ſecond, tenth, hundredth, &c. are ordinal numbers. See CARDINAL.

ORDINANCE, or ORDONNANCE, a law, ſtatute, or command, of a ſovereign or ſuperior.

Ordinance of parliament, is ordinarily uſed in the ſame ſenſe as ſtatute, or act of parliament.

In the parliament-rolls, acts are often called ordinances of parliament. Though in ſome caſes we find a difference made between the two; ordinances being only temporary things, by way of prohibition; and capable of being altered by the commons alone; whereas an act is a perpetual law, and cannot be altered but by king, lords, and commons.

Sir Edward Coke aſſerts, that an ordinance of parliament differs from an act, as the latter can only be made by the king, and the threefold conſent of the eſtates; whereas the former may be made by one or two of them.

Ordinance of the Foreſt, is a ſtatute made in the thirty-fourth year of Henry I. relating to foreſt matters. See FOREST.

In the French juriſprudence, ordonnances are ſuch laws as are eſtabliſhed by the king's authority alone. All ordonnances begin with *à tous preſens & à venir ſalut*. See CAPITULAR.

ORDINANCE, or *Ordnance*, is alſo a general term for all ſorts of great guns, or cannon, mortars, &c. uſed in war. See CANNON and GUN.

The ſtrength and ſerviceableneſs of a piece of ordnance depends much on the thickneſs of the metal, eſpecially about its chamber and breech, which is called its *fortification*.

Of this there were three degrees, both for cannons and culverins. Such were the ordinarily fortified, alſo called *legitimate pieces*. Thoſe whoſe fortification is leſſened, were called the *baſtard pieces*. Thoſe doubly fortified were called *extraordinary pieces*.

The fortification of a gun is reckoned from the thickneſs of the metal at the touch-hole, at the trunnions, and at the muzzle, in proportion to the diameter of the bore. For the dimenſions of pieces of ordnance now in uſe, and of their various parts, ſee CANNON.

ORDINANCE, in *Painting*. See ORDONNANCE.

ORDINANCE, or *Ordnance Office*, is the ſtanding grand magazine of arms, habiliments, inſtruments, and utenſils of war, as well by ſea as land; not only of thoſe lodged in the Tower, but in all the garriſons, caſtles, forts, &c. in Great Britain,

Britain, from whence, as occaſion requires, his majeſty's armies are ſupplied.

The *board* of ordnance directs and regulates every thing that relates to the artillery and garriſons. In 1683, the ſuperintendance of this board was committed to five chief officers, beſides the maſter-general.

The firſt and principal is the *maſter-general*, from whom are derived all orders and diſpatches relating to the ſame, as the ſervice ſhall beſt require, and who has the ſole command of the royal regiment of artillery. This poſt has often been annexed to the office of general and commander-in-chief. The ſame military reſpect is paid to the maſter-general of the ordnance, as to generals of horſe and foot; that is, on all occaſions to have the march beat to him, and to be ſaluted by officers, the colours excepted. The firſt maſter of the ordnance upon record was Rauf Bigod, who was appointed to this office for life 2d of June 1483.

Under him is a *lieutenant-general* of the ordnance, who receives orders from the maſter-general, and the reſt of the prime officers at the board; fees them duly executed; orders the firing of guns on days of rejoicing; and fees the train of artillery fitted out when ordered to the field.

Next to him is the *ſurveyor-general*, who has the inſpection of the ordnance, ſtores, and proviſions of war, in the cuſtody of the ſtore keepers; he allows all bills of debts, keeps a check on labourers, &c.

Under theſe is a *clerk* of the ordnance, who records all orders or inſtructions given from the government of the office; with all patents, grants, names of officers, &c. draws all eſtimates for proviſions, and ſupplies all letters, inſtructions, commiſſions, deputations, contracts, &c. and ſerves as a check between the two accomptants of the office, the one for money, the other for ſtores.

This office has alſo a *ſtore-keeper*, who takes into his cuſtody all ordnance, ammunition, ſtores, &c. thereto belonging; and indents and gives in legal ſecurity for the ſafe keeping thereof; and renders an exact account from time to time.

Here is alſo a *clerk of the deliveries*, whoſe duty is to draw up all proviſions, either at the Tower, or any other of his majeſty's magazines, to ſee them duly executed, &c.

To this office alſo belongs a *treaſurer* and *pay-maſter*, through whoſe hands paſſes the money of the whole office, as well for payment of ſalaries, as debentures.

Under theſe ſuperior officers belonging to the civil branch of the ordnance, there are ſecretaries and clerks, &c. The military branch of the ordnance is under the direction of a chief engineer, &c. See ENGINEER.

ORDINANCE, or *Ordnance Bills*, commonly called *ordnance debentures*, are bills iſſued by the board of ordnance on the treaſurer of that office, for the payment of ſtores, &c. Theſe are not payable at any certain time, and do not bear any intereſt, ſo that the diſcount upon them is often very high: but they are ſeldom much above two years in arrear.

ORDINANCE, *Spiking up the*. See SPIKING.

ORDINARII, in *Antiquity*, were a ſort of gladiators; being thoſe appointed to exhibit combats on certain ſtated days, &c.

ORDINARIO, Ital. common, uſual, in *Muſic*, as *tempo ordinario*, the uſual time. Theſe words are uſually prefixed to movements in common time, for "moderately quick."

ORDINARY, ſomething that happens, or paſſes frequently, or uſually.

We ſay, the ordinary courſe of things: whatever is done without miracles, is done by ordinary agents.

ORDINARY *Culverin*. See CULVERIN.

ORDINARY *Minion*, &c. See MINION, &c.

ORDINARY. *Ambaſſador*, or *Envoy in*. See EMBASSADOR, and ENVOY.

ORDINARY is alſo applied to ſeveral officers and ſervants belonging to the king's houſhold, who attend on common occaſions. Thus we ſay, phyſician in ordinary, &c.

ORDINARY is a term applied to ſhips of war *laid-up* in harbours near the royal dock-yards. It is alſo the eſtabliſhment of the perſons employed by the government to take charge of them, which are ſo laid-up. Theſe are principally compoſed of ſuperintendent maſters, warrant-officers, and ſervants of the ſaid ſhips, except the purſer, alſo a certain number of ſeamen in time of peace, according to the ſize of the ſhip. But in war there is a crew of labourers enrolled in the liſt of the ordinary, who paſs from ſhip to ſhip occaſionally to pump, clean, moor, or tranſport them whenever it is required.

The term ordinary is alſo applied to diſtinguiſh the inferior ſailors from the able ſeamen. Thus the latter are rated *able* on the navy books, and have a monthly pay ſuperior to that of thoſe who are rated *ordinary*.

ORDINARY, *Ordinarius*, in the *Civil Law*, is any judge veſted with authority to take cognizance of cauſes, in his own right, as he is a magiſtrate; and not by deputation.

ORDINARY *Court of Chancery*. See PETTY *Bag*.

ORDINARY, in *Common* and *Canon Law*, denotes him who has ordinary or immediate juriſdiction in eccleſiaſtical cauſes, as of courſe and common right; in oppoſition to perſons who are *extraordinarily* appointed.

In which ſenſe archdeacons are ordinaries. Though the appellation be moſt frequently given to the biſhop of the diocefe, who has the ordinary eccleſiaſtical jurifdiction, and the collation to benefices therein. However, in a more general acceptation, the word *ordinary* ſignifies (as above ſtated) any judge, authoriſed to take cognizance of cauſes in his own proper right, as he is a magiſtrate, and not by way of deputation or delegation.

There are ſeveral chapels, chapters, abbies, &c. exempted from the jurifdiction of the ordinary.

The archbiſhop is ordinary of the whole province, to viſit, and receive appeals from the inferior judicatures.

The Romiſh canoniſts call the pope *ordinary* of *ordinaries*, ſince by the Lateran council he has uſurped the right of collating, by prevention, to all benefices; in excluſion of the ordinary collators.

ORDINARY *of Aſſize and Seſſions*, was a deputy of the biſhop of the dioceſe, anciently appointed to give malefactors their neck-verſes, and judge whether they read or not; alſo to perform divine ſervice for them, and aſſiſt in preparing them for death. So

ORDINARY *of Newgate*, is one who is attendant in ordinary upon the condemned malefactors in that priſon, to prepare them for death; and he records the behaviour of ſuch perſons.

ORDINARY, or *Honourable Ordinary*, in *Heraldry*, a denomination given to certain charges properly belonging to that art.

The honourable ordinaries are by ſome writers reckoned *ten* in number; *viz.* the *chief*, *pale*, *bend*, *feſſe*, *bar*, *croſs*, *ſaltier*, *chevron*, *bordure*, and *orle*. See CHIEF, PALE, &c.

The heralds give ſeveral reaſons for their being called honourable: *viz.* 1. Their great antiquity, as having been uſed ever ſince armory was ſet on foot. And, 2. Becauſe they denote the ornaments moſt neceſſary for noble and generous men: thus the chief repreſents the helmet, wreath, or crown, covering the head; the pale repreſents his lance or ſpear;

ſpear; the bend and bar, his belt; the feſſe, his ſcarf; the croſs and ſaltier, his ſword; the chevron, his boots and ſpurs; and the bordure and orle, his coat of mail.

As to the allotting or diſtributing of theſe ordinaries, ſome authors write, that when a gentleman, having behaved himſelf gallantly in fight, was preſented to the prince, or general, and a ſuitable coat-armour ordered him; if he were wounded in the head, they gave him a chief; if in the legs he had a chevron; and if his ſword and armour were diſcoloured with the blood of the enemies, a croſs or bordure.

Some heralds have attempted to increaſe the number of honourable ordinaries to twenty; adding to thoſe above mentioned, the *plain quarter*, the *giron*, the *eſcutcheon*, *cappe* dexter and ſiniſter, *emmanch* dexter and ſiniſter, *chauſſe* dexter and ſiniſter, and the *point*. But theſe are not yet authoriſed.

Some writers diſtinguiſh ordinaries into *honourable* and *ſubordinate*. *Honourable* ordinaries, which are the principal charges in heraldry, they define as made of lines only; which, according to their diſpoſition and form, receive different names. Of theſe they reckon nine, *viz.* the *chief*, *pale*, *bend*, *bend ſiniſter*, *feſs*, *bar*, *chevron*, *croſs*, and *ſaltier*. The *ſubordinate* ordinaries are ancient heraldie figures, frequently uſed in coats of arms, and diſtinguiſhed by peculiar terms: theſe are the *giron*, *canton*, *fret*, *pile*, *orle*, *inveſcutcheon*, *treſſure*, *flanches*, *flaſques*, *voiders*, *loxenge*, *fuſil*, and *maſcle*.

Mr. Edmondſon reckons nineteen ordinaries; *viz.* *chief*, *pale*, *bend*, *feſs*, *bar*, *border*, *eſcutcheon*, *flaſque*, *flanch*, *voider*, *croſs*, *ſaltier*, *chevron*, *fret*, *pile*, *gyron*, *quarter*, *canton*, and *file* or *label*; which ſee reſpectively.

ORDINATE. See CO-ORDINATE.

ORDINATES, in *Geometry* and *Conics*, are lines drawn from any point of the circumference of an ellipſis, or other conic ſection, perpendicularly acroſs the axis, to the other ſide.

The Latins call them *ordinatim applicatæ*.

The halves of each of theſe are properly only *ſemi-ordinates*, though popularly called *ordinates*.

The ordinates of a curve may more generally be defined to be right lines parallel to one another, terminated by the curve, and biſected by a right line called the *diameter*. In curves of the ſecond order; if any two parallel right lines be drawn ſo as to meet the curve in three points; a right line which cuts theſe parallels ſo, as that the ſum of two parts terminating at the curve on one ſide the ſecant, is equal to the third part terminated at the curve on the other ſide; will cut all other right lines parallel to theſe, and that meet the curve in three points, after the ſame manner, *i. e.* ſo as that the ſum of the two parts on one ſide will always be equal to the third part on the other ſide. And theſe three parts, equal on either ſide, ſir Iſaac Newton calls *ordinatim applicatæ*, or ordinates of curves of the ſecond order. See CURVE.

ORDINATE *in a Parabola*, *Hyperbola*, and *Ellipſis*. See the reſpective articles.

ORDINATE *Ratio*, is that in which the antecedent of the firſt ratio is to its conſequent, as the antecedent of the ſecond is to its conſequent.

ORDINATION, the act of conferring holy orders; or of initiating a candidate into the diaconate, or prieſthood.

As to the qualification of the perſons to be ordained, ſee DEACON and PRIEST.

The form of ordination in the church of England is annexed to the book of Common Prayer, and the authority of it eſtabliſhed by 5 & 6 Edw. VI. c. 1. 8 Eliz. c. 1. by art. 36. of the thirty-nine articles, by the eighth canon, and alſo by the act of Uniformity, 13 & 14 Car. II. c. 4. This act directs, that all ſubſcriptions to be made to the thirty-nine articles ſhall be conſtrued to extend (touching the 36th article above-mentioned), to the book containing the form and manner of making, ordaining, and conſecrating of biſhops, prieſts, and deacons in this act mentioned, as the ſame did heretofore extend unto the book ſet forth in the time of king Edward VI.

It is required, previouſly to ordination, by 1 Eliz. c. 1. and 1 W. c. 8. that every perſon taking orders, ſhall take the oaths of allegiance and ſupremacy before the ordinary or commiſſary: and by the 31 Eliz. c. 12. none ſhall be admitted to the order of deacon, or miniſtry, unleſs he ſhall firſt ſubſcribe to all the articles of religion agreed upon in convocation in the year 1562, which only concern the confeſſion of the true Chriſtian faith, and the doctrine of the ſacraments. By can. 36. no perſon ſhall be received into the miniſtry, except he ſhall firſt ſubſcribe to the following articles: 1. That the king's majeſty, under God, is the only ſupreme governor of this realm, and of all other his highneſs's dominions and countries, as well in all ſpiritual or eccleſiaſtical things or cauſes, as temporal; and that no foreign prince, perſon, prelate, ſtate or potentate hath, or ought to have, any juriſdiction, power, ſuperiority, preeminence or authority, eccleſiaſtical or ſpiritual, within his majeſty's ſaid realms, dominions and countries. 2. That the book of Common Prayer, and of ordering of biſhops, prieſts, and deacons, containeth in it nothing contrary to the word of God, and that it may lawfully be uſed, and that he himſelf will uſe the form in the ſaid book preſcribed in public prayer, and adminiſtration of the ſacraments, and none other. 3. That he alloweth the book of articles of religion agreed upon by the archbiſhops and biſhops of both provinces, and the whole clergy, in the convocation holden at London, in the year of our Lord God 1562; and that he acknowledgeth all and every the articles therein contained, being in number thirty-nine, beſides the ratification to be agreeable to the word of God. This ſubſcription is to be made before the biſhop himſelf. And for the avoiding all ambiguities, that perſon ſhall ſubſcribe in this form and order of words, ſetting down both his chriſtian and ſurname, *viz.* I N.N. do willingly and ex animo ſubſcribe to theſe three articles above-mentioned, and to all things that are contained in them. And if any biſhop ſhall ordain any, except he ſhall firſt have ſo ſubſcribed, he ſhall be ſuſpended from giving of orders for the ſpace of twelve months. By can. 31. the ordination, as well of deacons as miniſters, ſhall be performed in the time of divine ſervice, in the preſence not only of the archdeacon, but of the dean and two prebendaries at the leaſt, or (if by any lawful cauſe they ſhall happen to be let or hindered) in the preſence of four other grave perſons, being maſters of the arts at the leaſt, and allowed for public preachers. In practice a leſs number than is required, either by the ſtat. 21 Hen. VIII. c. 13. or by the foreſaid canon, is ſometimes admitted; by virtue, as it is ſaid, of the rubric in the office of ordination, which directeth, "that the biſhops with the prieſts preſent ſhall lay their hands upon the perſons to be ordained;" implying, as is ſuppoſed, that if there are but two prieſts preſent, it ſufficeth by this rubric, which is eſtabliſhed by the act of parliament of the 13 & 14 C. 2. For other particulars, ſee the form of ordination already cited, and the articles DEACON and PRIEST.

The council of Rome, in 744, orders that no ordinations ſhall be held except on the firſt, fourth, ſeventh, and tenth

tenth months. With us, by can. 31, ordination days are the four Sundays immediately following the Ember weeks; being the ſecond Sunday in Lent, Trinity Sunday, and the Sundays following the firſt Wedneſday after September the 14th, and December the 13th.

The ordination of biſhops is more properly called *conſecration*; which ſee.

Ordination has always been eſteemed the principal prerogative of biſhops; and they ſtill retain the function as a kind of mark of ſpiritual ſovereignty in their dioceſes.

In the ancient diſcipline, there was no ſuch thing as a vague, and abſolute ordination; but every one was to have a church, of which he was to be ordained clerk, or prieſt. In the twelfth century they grew more remiſs, and ordained without any title or benefice.

The council of Trent reſtored the ancient diſcipline, and appointed, that none ſhould be ordained but thoſe who were provided of a benefice ſufficient to ſubſiſt them. The ſhadow of which practice ſtill obtains among us.

The reformed hold the call of the people the only thing eſſential to the validity of the miniſtry; and teach, that ordination is only a ceremony, which renders the call more auguſt and authentic.

Accordingly the Proteſtant churches of Scotland, France, Holland, Switzerland, Germany, Poland, Hungary, Denmark, &c. have no epiſcopal ordination. For Luther, Calvin, Bucer, Melancthon, &c. and all the firſt reformers and founders of theſe churches, who ordained miniſters among them, were themſelves preſbyters, and no other. And though in ſome of theſe churches there are miniſters called ſuperintendants, or biſhops, yet theſe are only *primi inter pares*, the firſt among equals; not pretending to any ſuperiority of orders. Having themſelves no other orders than what either preſbyters gave them, or what was given them as preſbyters, they can convey no other to thoſe they ordain. On this ground the Proteſtant diſſenters plead that their ordination, though not epiſcopal, is the ſame with that of all the illuſtrious Proteſtant churches abroad; and object, that a prieſt ordained by a Popiſh biſhop, ſhould be received into the church of England as a valid miniſter, rightfully ordained; whilſt the orders of another, ordained by the moſt learned, religious preſbyter, which any foreign country can boaſt, are pronounced not valid, and he is required to ſubmit to be ordained afreſh.

In oppoſition to epiſcopal ordination, they urge, that Timothy was ordained by the laying on of the hands of the preſbytery (1 Tim. iv. 14.), that Paul and Barnabas were ordained by certain prophets and teachers in the church of Antioch, and not by any biſhop preſiding in that city (Acts xiii. 1, 2, 3.), and that it is a well known fact, that preſbyters in the church of Alexandria, ordained even their own biſhops for more than two hundred years in the earlieſt ages of Chriſtianity. They farther argue, that biſhops and preſbyters are in ſcripture the ſame; and not denominations of diſtinct orders or offices in the church: referring to Philip. i. 1. Tit. i. 5. 7. Acts, xx. 27, 28. and 1 Pet. v. 1, 2. To the ſame purpoſe they maintain, that the ſuperiority of biſhops to preſbyters is not pretended to be of divine but of human inſtitution, not grounded on ſcripture, but only upon the cuſtom or ordinances of this realm, by the firſt reformers and founders of the church of England, nor by many of its moſt learned and eminent doctors ſince. See Stillingfleet's Irenic. chap. 8. p. 385. in which the learned author affirms and ſhews this to be the ſentiment of Cranmer, and other chief reformers both in Edward VI. and queen Elizabeth's reign, of archbiſhop Whitgift, biſhop Bridges, Loe, Hooker, Sutcliff, Hales, Chillingworth, &c. Moreover, the book intitled the "Inſtitution of a Chriſtian Man," ſubſcribed by the clergy in convocation, and confirmed by parliament, owns biſhops and preſbyters by ſcripture to be the ſame. Beſides, the Proteſtant diſſenters allege, that if epiſcopal ordination be really neceſſary to conſtitute a valid miniſter, it does not ſeem to be enjoined by the conſtitution of the church of England: becauſe the power of ordination which the biſhops exerciſe in this kingdom, is derived entirely and only from the civil magiſtrate; and he authoritatively preſcribes how, and to whom ordination is to be given: that if an ordination ſhould be conducted in other manner and form than that preſcribed by him, ſuch ordination would be illegal, and of no authority in the church. Accordingly the biſhop at the ordination of the candidate aſks, Are you called according to the will of our Lord Jeſus Chriſt, and the due order of this realm? The conſtitution and law of England ſeem to know nothing of uninterrupted lineal deſcent, but conſiders the king, veſted (by act of parliament or the ſuffrage of the people) with a fullneſs of all power eccleſiaſtical in theſe realms, as empowering and authoriſing biſhops to ordain: and this power of ordination was once delegated to Cromwell, a layman, as vicegerent to the king. They farther think it ſtrange, that the validity of orders and miniſtrations ſhould be derived, as ſome have contended, from a ſucceſſion of Popiſh biſhops; biſhops of a church, which, by the definition of the nineteenth article of the church can be no part of the true viſible church of Chriſt, and biſhops, likewiſe, who conſider the Proteſtant clergy, although ordained by Proteſtant biſhops, as mere common unconſecrated laymen. They object alſo to that ſubſcription, which is the term of ordination in the church of England. See Towgood's Diſſent from the Church of England fully juſtified, &c. edit. 5. 1779, p. 196, &c.

Pope Alexander II. condemns ordination *per ſaltum*, as they call it; *i. e.* the leaping to a ſuperior order without paſſing through the inferior.

Ordination is one of the ſacraments of the church of Rome.

ORDINE, order, arrangement; or the combination of many diſtinct things to make a whole. The term is uſed by the Italians in ſpeaking of the muſic of the ancients for ſyſtem: as *ordine di Mercurio, di Terpandro, di Filitao, di Pitagoro*, &c. to mark the order in which each of theſe authors arranged the ſounds, in their ſeveral ſyſtems, their number, and what diſtance and proportion they gave them; and they ſay of a tetrachord, that it is in *ordine di quattro corde*: that is, entirely compoſed of, and diviſible by, four ſtrings or ſounds. See TETRACHORD.

ORDINGEN, in *Geography*. See URDENGEN.

ORDNANCE. See ORDINANCE.

ORDORF, in *Geography*, a town of Saxony, in Thuringia; 10 miles S. of Gotha.

ORDONNANCE, or ORDINANCE, in *Painting*, denotes the diſpoſition of the parts of a picture either with regard to the whole piece, or to the ſeveral parts; as the groups, maſſes, contraſts, aſpects, &c.

In the ordonnance there are three things regarded; *viz.* the place, or ſcene, where; the diſtribution, how; and the contraſt.

In the firſt, regard is to be had to the diſpoſition of things to ſerve as a ground-work; and to the plan, or poſition of bodies: under the former of which come, 1. The *landſcape*; whether an uninhabited place, where there is full liberty of repreſenting all the extravagancies of nature; or inhabited, where the marks of cultivation, &c. muſt be exhibited.

2. The *building*, whether ruſtic; in which the painter's

fancy is at liberty: or regular; in which a nice attention is required to the orders.

3. The mixture of both; in which it is a maxim to compose in great pieces, and make the ground-plot big enough, to neglect some little places, in order to bestow more on the whole mass, and to shew the more considerable places with the more advantage; and to mark some agitation in all the things that move.

As to the *plans* of bodies, they are either solid; which, again, are either so by nature, and which must be proportioned to their places; or artificial, where regard is to be had to the rules of geometry, perspective, architecture, &c. Or they move: which they do, either by a voluntary motion, in which care must be had to proportion them to their situation, and to strengthen them by regarding the equilibrium; or by some extraordinary power, as machines, &c. where the causes of their motions must appear. Or they are things at a distance. In all which an even plane must still be proposed to find their precise situation, and settle their place by sudden breaks and distances agreeable to perspective.

In placing the figures, regard must be had, 1. To the *group*, which connects the subject, and stays the sight. In this are to be considered the knot or nodus, which binds the group; and the nearness of figures, which we may call the chain, as it holds them together; that the group be sustained by something loose and distinct from it; and by the same joined and continued to the other groups: and that the lights and shadows be so disposed, as that we may at once see the effect of all the parts of the composition.

2. To the *actions*, in which forced attitudes are to be avoided, and simple nature shewn in her most advantageous posture. In weak and lean figures, the nudities are not to be shewn; but occasions of covering them are to be sought. In all human figures, special care to be taken, the head be well placed between the shoulders; the trunk on the haunches; and the whole on the feet.

3. To the *drapery*; which is to be adjusted, so as it may appear real garments, and not stuffs loosely thrown on. The folds to be so disposed as to leave the great parts, in which the nudity may appear, free; ranging the little folds about the joints, and avoiding them on the relievo of the members. And, lastly, to dispose the draperies, by raising the stuff, and letting it fall easily and lightly, that the air, sustaining the folds, may let them fall soft.

Lastly, in the *contrast*, are to be considered the actions, which vary infinitely: the aspects, which in actions of the same kind, may, by their difference, make a contrast: the situation, according as they meet above or under the sight, far or near. And, lastly, custom; which extends, indeed, to all parts of painting, but is particularly to be regarded in the ordonnance; to be managed discreetly, however, and stiffness and formality avoided.

Ordonnance, in *Architecture*, is nearly the same as in painting; *viz.* the composition of a building, and the disposition of its parts, both with regard to the whole, and to one another.

Vitruvius defines ordonnance to be that which regulates the size or magnitude of all the parts of a building with respect to their use.

This definition is censured by M. Perrault, who takes the ordonnance to consist in the division of the plan or spot of ground on which the building is to be raised; *i. e.* in the apportioning or laying it out, agreeable to the intended dimensions of the whole fabric; which Mr. Evelyn expresses in fewer words, by "determining the measure or what is assigned to compose the several apartments."

On this foundation, ordonnance is the judicious contrivance of the plan or model; as when the court, hall, lodgings, &c. are neither too large, nor too little: but the court, *v. gr.* affords convenient light to the apartments about it, and is large enough for usual access. The hall of fit capacity to receive company; the bed-chambers accordingly, &c. When these divisions are either too great or too small, with respect to the place, as a large court to a little house, or a little chamber, in a magnificent palace; the fault is in the ordonnance.

This the ancients called *taxis*; and distinguished it from *diathesis*, disposition; which is, where all the parts and members of a building are assigned their just places and situation with regard to their quality, office, rank, &c. without any regard to the dimensions, or quantity: as, that the vestibule or porch be before the hall, the hall before the parlour, and that before the withdrawing-room, &c. The bed-chambers, again, to look to the sun-rising; and libraries, galleries of paintings, and cabinets of curiosities, &c. to the north.

ORDOVICES, in *Ancient Geography*, inhabitants of that country which is now called North Wales, and contains the counties of Montgomery, Merioneth, Carnarvon, Denbigh and Flint. These Ordovices, or as Tacitus calls them, Ordeuices, are supposed to have been originally of the same tribe or nation with the Huicii of Warwickshire, who were under some kind of subjection to the Cornavii; but the Huicii of North Wales, being a free and independent people, were called Ordh-Huici, or the free Huici. When they were invaded by the Romans, they shewed a spirit worthy of their name, and fought with great bravery in defence of their freedom and independence. Though they sustained a great defeat from the Roman general Ostorius, in conjunction with the Silures, they maintained the war for a considerable time, until they were finally subdued, with great slaughter, by the renowned Agricola. It was partially owing to the nature of the country, and to the vicinity of Diva, now Chester, where a whole legion was quartered, that the Romans had so few towns or stations in the territories of the Ordovices. Mediolanium was the capital of the nation, and was probably situated at Maywood or Meifad in Montgomeryshire. In the time of the Romans this was a place of some note, but it was afterwards quite demolished by Edwin, king of Northumberland. Besides this, the Romans had a small number of other towns in this country; as Segontium now Carnarvon, Conovium now Conway, and Varæ now Bodvary, all mentioned in the 11th journey of Antoninus. The country of the Ordovices was comprehended in the Roman province, which was called Britannia Secunda.

ORDUNA, in *Geography*, a small town of Spain, in the province of Biscay; situated to the S. of Bilbao, in a pleasant valley, encompassed on all sides by high and steep mountains. It has two parish churches, a convent of monks, and another of nuns. The interior custom-house of Biscay is established here; but it only collects the duties upon merchandize imported into Castile; 42 miles S.W. of St. Sebastian. N. lat. 42° 56′. W. long. 2° 57′.

ORE, a town of Sweden, in Dalecarlia; 60 miles N.N.W. of Fahlun.

Ores, in *Mineralogy* and *Metallurgy*, signify those mineral substances found in the earth, from which metals are procured. The ores of most of the metals consist of the metal combined with some other substance, and the process by which the metal is separated from the combined matter, is termed the reduction of the ore. We shall not here enumerate the ores of the different metals, as they are amply treated of under the respective metals.

*Assay and Analysis.*—This branch of operative chemistry

is divided into two parts, the one called the humid, and the other the dry analyſis. By the firſt of theſe, the ſubſtance is diſſolved in acids or alkalies, and the different conſtituents ſeparated by different re-agents. The dry proceſs conſiſts in firſt expoſing the ore to a red heat, for the purpoſe of ſeparating its volatile parts. The remainder is then treated with certain fluxes and inflammable matter, to ſeparate the metal which is found in a rounded form, at the bottom of the crucible, and hence is called a button.

A little reflection will make it clear, that the humid analyſis ſhould always precede that of the dry. In order to know the nature of the particular flux to be employed after its ore has been roaſted and its volatile products aſcertained, it may be ſubjected to the action of ſome acid, and firſt the muriatic. If this has no action upon it, try the nitric; ſhould this acid not diſſolve the whole, try the nitro-muriatic, which may conſiſt of equal parts of the two acids. If the whole is not diſſolved by this, it may be preſumed that the ore contains flint, or ſome ſalt not decompoſable by the above acids. Under either of theſe circumſtances it is proper to fuſe the ore with pure potaſh, in a ſilver crucible. The fuſed maſs will be of a dark green if iron be preſent, of a graſs green if the ore contain copper, blue with cobalt, yellow with lead, and purple with manganeſe. This maſs being boiled for ſome time with diſtilled water, till all the ſoluble matter is taken up, muſt now be treated with nitric acid. It is probable that all, except the ſilex, will be diſſolved in the acid. From this acid ſolution, with the different liſts, it muſt be aſcertained what are the conſtituents of the ore, and afterwards the different ſubſtances muſt be ſeparated with a view to determine their proportions. See under the different metals *Aſſay and Analyſis*.

When the nature and proportions of the different ſubſtances combined with the metal conſtituting the ore are made out, the next thing is to expoſe it in a crucible, with ſuch ſubſtances as will combine with the matter to be ſeparated, the compounds either becoming fuſible or being ſeparated in the form of gas. For inſtance, in the ſmelting of iron ores of the argillaceous kind, lime is uſed in order to form a fuſible compound with the alumine, and charcoal or coak in order to form carbonic acid with the oxygen of the oxyd of iron. If the ore contain ſilex, potaſh or ſoda ſhould be uſed in order to form glaſs, which is greatly more fuſible than the earth would have been with the metallic oxyd alone. Borax is frequently employed as a flux from its great facility of combining with the ſilex and other earths. See STONES, *Analyſis of*.

ORES, *Dreſſing*, or *Waſhing of*, is the preparing them as they come rough from the mine, for the working by fire. This is done ſeveral ways in different countries, and in reſpect to the different ores of the metals. In Devonſhire we have a very eaſy method, which is ſo expeditious, and ſo good for all the purpoſes, that it is worthy of imitation in other places. After the ore is dug, it is toſſed up by hand from ſhamble to ſhamble by the ſhovel-men in the mine, and drawn up in buckets by a winch at the top of the ſhaft. As ſoon as the whole quantity for one dreſſing is brought up, the large ſtones are broken, and the whole is then carried to the mills, where one horſe turns a wheel that moves the machines for powdering a great quantity of it: theſe are called the ſtamping or knocking mills. The ore is unloaded at the head of the paſs or entrance into theſe mills: this paſs is made of two or three bottom-boards and two ſide-boards, in form of a hollow trough, and ſtands in a ſlanting direction. The ore by its own weight is carried down this trough, and lodges itſelf in the coffer. The coffer is a long ſquare box, made of the firmeſt timber, and of three feet long, and a foot and half broad. The ore is not ſuffered to fall into this all at once, but is ſtopped over the mouth of the trough by a croſs board, where a cock turns in a quantity of water at the ſame time, which waſhes down juſt as much of the ore with it into the trough, as there ought to be. In this coffer there are three lifters placed between two ſtrong board-leaves, having two braces or thwart-pieces on each ſide to keep them ſteady, as a frame with ſtamp-heads. Theſe heads are of iron, and weigh about thirty or forty pounds a-piece, and ſerve to the breaking of the lumps of ore in the coffer.

The lifters are about eight feet long, and half a foot ſquare. They are always made of heart of oak, and have as many in-timbers or guiders between them: they are lifted up in order, by a double number of tappets, which are faſtened to as many arms paſſing diametrically through the great beam, which is either turned by the wheel and horſe, or, where there is a conveniency of water, by an overſhot water-wheel on two boulſters. The tappets exactly but eaſily meet with the tongues, which are ſo placed in the lifters, as that they eaſily ſlide from each other, and ſuffer the lifters to fall with great force on the ore in the trough. The frequent pounding of theſe ſoon reduces the large maſſes into a ſort of ſand, which is waſhed out of the trough by the continual current of the water from the cock through a braſs-grate, which is placed at one end of the coffer between two iron bars. This operation is called by the miners *bricking*, or brick-working the ore. See BUDDLE.

The powdered ore is conveyed out of the trough into the *launder*, which is a trench cut in the floor of eight feet long, and ten feet over. This is ſtopped at the lower end with turf, ſo that the water is all ſuffered to paſs away, and the powder of the ore is ſtopped. Thus the launder by degrees fills up with the dreſſed ore, and this is removed out with ſhovels, as occaſion requires. The launder is divided into three parts, the forehead, the middle, and the tail: that ore which lies in the forehead, that is, within a foot and a half of the grate, is always the richeſt and beſt, and is laid up in a heap by itſelf; the middle and tail afford a poorer one, and theſe are ſometimes laid up in ſeparate heaps; ſometimes thrown in one heap together.

ORES, *Eſſaying*, or *Aſſaying of*. See ASSAY, ORE ſupra, and the following references. See alſo Cramer's Art of Aſſaying.

ORES *of Antimony*, *Arſenic*, *Biſmuth*, *Cobalt*, *Copper*, *Gold*, *Iron*, *Lead*, *Mercury*, *Platina*, *Silver*, *Tin*, *Zinc*. See the ſeveral articles.

ORES, *Smelting of*. See SMELTING.

ORE-*Weed*, in *Agriculture*, a general name for weeds growing at the bottom of the ſea, and alſo on the muddy and rocky parts of the ſhore. Theſe ſorts of ſea-weeds form ſo beneficial a manure, that farmers ought not to grudge the expence of carrying them a few miles. It is a practice in Devonſhire, Cornwall, and ſome other maritime parts of England, to have theſe weeds laid in heaps till they are rotten, and then ſpread upon the land, about a load to three rods. But this laſts only one year, unleſs ſand, or a ſtiff earth, according to the quality of the ſoil intended to be improved, be laid on or mixed with them; and then they become a laſting manure. In ſome places, theſe weeds are gathered in heaps, and burnt as ſoon as they are dry: after which, about a buſhel of their aſhes is laid upon three rods of ground. But theſe, like all other aſhes, ſhould be mixed with ſand, or ſtiff earth, in order to have the land left good: otherwiſe they are only an improvement for a year. Theſe aſhes are particularly good for graſs-grounds over-run with moſs. Looſe ſandy ſoils are likewiſe peculiarly benefited

by this weed; but being a ſubmarine plant, the wind and ſoil ſoon exhale its moiſture; ſo that the more ſpeedily it is taken from the ſhore, where ſtorms often throw it up in great quantities, the better it is. When ſpread on the ground, and afterwards covered over, it ſoon diſſolves into a ſaline, mucilaginous, ſlimy matter, proper to fertilize and bind light ſoils. This is the moſt approved way of applying it; though ſome lay it naked and freſh from the ſea, upon their barley land, towards the end of March and beginning of April, and have a good crop of corn: but ſuch quantities of rank weeds are apt to ſhoot up afterwards, that no wholeſome plant is to be expected that year.

It may be noticed, that the value of the lands on ſome of the coaſts of Scotland has been more than doubled by the uſe of this excellent manure. It is chiefly uſed there for barley; and the farmers watch every opportunity, when it is thrown in by the ſea, and lay it on at all ſeaſons, in autumn, winter, and ſpring. But if they could chooſe their time, it would probably do beſt about the month of March; for being then ploughed into the ground, and afterwards ploughed up again to the ſeed, it would be better incorporated and blended with the ſoil: whereas, if it be laid on in autumn, before the fallowing or firſt ploughing, it is too much waſted before the ſpring; and if it be laid on the ſeed furrow, it is apt to burn the ground in a dry ſeaſon, though it will do very well in this method in a wet ſummer. Its effects are but juſt felt the ſecond year; though it is laid on thicker upon ſtrong clay land, which receives no other manure for three crops, *viz.* barley, oats, peaſe and beans; a method which might perhaps be altered for the better, by omitting the oats, and ſowing alternately barley, and peaſe and beans, and laying on the ſea-ware, as theſe weeds are commonly called, for every ſecond crop of peaſe and beans.

It would ſeem clear, from Mr. Scott's account of the manner of uſing the ſea-ware in Scotland, as publiſhed by Mr. Maxwell, that much of this valuable manure muſt neceſſarily be loſt through want of proper management, as they have no reſervoirs to keep it in, when thrown aſhore at a ſeaſon in which they cannot uſe it, or where there is no ground in tilth, as is generally the caſe in winter, and during the buſy part of their hay and corn harveſt. It ſhould be collected on theſe occaſions, and lodged in a place free from any running water; and as it is equally beneficial to ſtrong or light lands, it might be there covered with ſand or clay, according to the nature of the ſoil for which it is intended. This will prevent its being parched by the ſun, or its diſſolving into a putrid maſs, which, if not ſecured in this manner, would either be waſhed away by rains, or fly off into the air: whereas, when thus covered, it would greatly enrich the clay or ſand, and render them good manures for their oppoſite ſoils. If it be thrown aſhore at a time when it can be ploughed in directly, that is ſuppoſed the beſt manner of uſing it.

It is ſtated, that there is a kind of land all along the coaſt, which is gravelly, and covered over ſo thick with ſea-ſtones, that, to look at it, one would not think corn could ſpring through them; and another ſort of land, which is a deadiſh ſand. To both theſe grounds ſea-ware is the only manure; for dung of all kinds has been often tried, but with no ſucceſs; and yet ſea-ware makes them bring excellent crops of barley. This kind of ground is ſeldom ploughed more than twice, and the ſea-weed is generally laid on before the firſt ploughing. Barley is ſowed during two years, and peaſe the third; a freſh manure of ſea-weed being laid on each year that barley is ſown. As little wheat is cultivated in ſome parts, the farmers there might probably improve their practice of raiſing barley and peaſe, by ſowing them alternately, and laying the ſea-ware to the peaſe. In the ſummer it is carried to a diſtance from the ſea, and laid upon ley-ground, (arable land under graſs,) which, though in very ill heart, will bear a good crop of oats with only once ploughing, or of barley, if ploughed again in the ſpring.

But another kind of ſea-ware, of a much ſtronger nature than that which is thrown up by the waves, is cut from the rocks at low water, and will laſt three years. It coſts more labour, but brings greater recompence. The beſt time of laying this on the ground is ſuppoſed to be in autumn, before the land is ploughed rough for a ſpring crop. It is ſaid that the farmers on the coaſts of Scotland prefer this manure to any other, eſpecially for their light grounds; and it has the advantage of being much more eaſily tranſported, becauſe one load of it will go as far as two of dung. It does very well in kitchen gardens, where Mr. Scott has ſeen pot-herbs and roots of an extraordinary ſize produced by its help; and he has known fruit-trees, perfectly barren before, rendered extremely fruitful by laying this manure about the roots. See SEA-*Weed* and MANURE.

OREBRO, in *Geography*, a town of Sweden, the capital of the province of Nericia, or Nerike, ſituated near the weſtern extremity of the lake Hielmar. Upon a ſmall iſland in the centre, formed by two branches of the Swart, ſtands the caſtle, which was formerly a royal reſidence, and is now appropriated to the governor of the province. The inhabitants ſend iron, vitriol, and red paint to Stockholm; and the trade with that capital acroſs the Hielmar and Mæler, by means of the canal of Arboga, is very conſiderable. The town poſſeſſes manufactories of fire-arms, cloth, and tapeſtry; 88 miles W. of Stockholm. N. lat. 59° 15′. E. long. 15° 4′.

OREBY-BUS, a town of Sweden, in Weſtmanland; 20 miles N. of Upſal.

ORECHOVITZ, a town of European Turkey, in Bulgaria; 28 miles W.S.W. of Nicopoli.

OREDESCH, a river of Ruſſia, which runs into the Luga; 16 miles N. of Luga.

OREEHOUA, one of the ſmaller Sandwich iſlands, being a ſingle high hummock, joined by a reef of coral rocks to the northern extremity of Oneeheow. The number of inhabitants is ſtated by captain King, in Cook's third Voyage, vol. iii. at 4000. N. lat. 22° 2′. E. long. 199° 52′.

OREGAN, or *River of the Weſt*, a river of North America, which runs into the Pacific ocean, N. lat. 43° 18′.

OREGIUS, AUGUSTINE, in *Biography*, a learned Italian cardinal and philoſopher, was born of parents in humble circumſtances at Florence, in the year 1577. At a very early age he afforded ſtriking indications of good natural abilities, and a great love of learning, and met with friends who ſent him to purſue his ſtudies at Rome. Here an adventure occurred to him, ſimilar to that which befel the youthful Joſeph, in the houſe of his Egyptian maſter, and he proved equally faithful to his duty. When cardinal Bellarmine was apprized of this fact, he took the young man under his particular patronage, and placed him in a college, where the young men of the principal families in Rome were educated. He improved the advantages of his ſituation with the greateſt diligence and ſucceſs, and became a proficient in the Greek tongue, in philoſophy, and in ſeveral other branches of literature. Little is related with reſpect to the perſonal hiſtory of Oregius; but he appears to have entered into orders, and to have reſided at firſt with cardinal Bellarmine, and afterwards with Barberini, who became pope by the name of Urban VIII. While the cardinal Barberini was

legate at Bologna, he employed Oregius to examine whether Ariſtotle taught the mortality of the ſoul, with the intention, ſhould that be the caſe, of perſuading the pope to prohibit his works as far as regarded that ſubject. On this occaſion he vindicated Ariſtotle in a piece, entitled "Ariſtotelis vera de rationalis Animæ Immortalitate Sententia," which was publiſhed at Rome in 1631. He publiſhed other theological pieces about the ſame time. Upon the acceſſion of Urban VIII. to the papal dignity, he made Oregius his divine, and in 1634 raiſed him to the purple, and preſented him to the archiepiſcopal ſee of Benevento. He died in the following year. He was author of a work "De Angelis," and another "De Operibus ſex Dierum," which were printed at Rome in 1632. His works were collected and printed in a folio volume, in 1637. Bayle. Moreri.

OREGRUND, or OEREGRUND, in *Geography*, a ſea-port town of Sweden, in the province of Upland, ſituated on the ſea-coaſt, and built in 1491 by ſome inhabitants of Oeſthammer, who left that town becauſe of the great decreaſe of water in the harbours, which entirely ruined its trade. Oregrund was a ſtaple town till the year 1630, and has been three times burnt and quite demoliſhed by the Ruſſians. The harbour is defended from the violence of the ſea by a mole; 34 miles N.N.E. of Upſal. N. lat. 60° 20'. E. long. 18° 15'.

OREILLARD, in the *Manege*. See WIDE-*Eared*.

OREILLE, Fr., *Orecchio*, Ital., the ear. This word, ſays Rouſſeau, is uſed figuratively as a muſical term. To have an ear, is ſaid of a perſon fond of muſic, whoſe auricular organ is well conſtructed, ſenſible, nice, and juſt in judging of the perfections and imperfections of muſical tones, whether as to tune or time. With a bad or falſe ear, a ſinger neither ſings in tune, nor can judge accurately of the intonations of others; and when inſenſible to the preciſion of meaſure, the time is broken and changed perpetually, without knowing it.

Thus, the word *ear* is always uſed for a diſcriminating quickneſs and delicacy in the ſenſe of liſtening or hearing muſical tones. See EAR.

OREL, in *Geography*, a town of Ruſſia, and capital of the government of Orlovſkoe, on the Oka; 176 miles S.S.W. of Moſcow. N. lat. 52° 56'. E. long. 36°.

ORELIA, in *Botany*. See ALLAMANDA.

ORELLANA, FRANCIS, in *Biography*, a Spaniſh adventurer, celebrated as the firſt European navigator of the river Maragnon, was a young officer, ſecond in command to Gonzalo Pizarro, in an expedition undertaken in 1540, from Quito in Peru, for the diſcovery of the inland country to the eaſt of the Andes. The party had reached the banks of the Coca, a large river which diſcharges itſelf into the Maragnon, or Maranon, when they built a bark of green wood, for the purpoſe of aſſiſting their progreſs, and manned it with fifty ſoldiers, under the command of Orellana. He embarked in February 1541, and committed himſelf to the current without compaſs or pilot, and actually reached the ocean in about ſeven months. He got ſafe to Cubagua, whence he ſailed to Spain. (See AMAZON, AMAZONIA, and MARANON.) Ten years after this, he was entruſted with the command of three veſſels from Spain, with which he periſhed, without having been able to diſcover the true mouth of the river, which he had before navigated, and which is ſometimes now called by his name, as by the author of the Seaſons:

"Swell'd by a thouſand ſtreams, impetuous hurl'd
From all the roaring Andes, huge deſcends
The mighty Orellana."

ORELLANA, in *Botany*. See BIXA.

ORELLANA, in *Geography*, a town of Spain, in the province of Eſtramadura, on the Guadiana; 24 miles E. of Merida.

ORENBURG, a town of Ruſſia, and capital of a province, to which it gives name, in the government of Upha, on the Ural. This town with its fortreſs was built in 1738, by order of the empreſs Ann, at the conflux of the Or and Ural; but the ſituation being found inconvenient, the inhabitants were removed to a new town built lower down on the Ural in 1749: ſince the eſtabliſhment of a conſiderable commerce here, all Ruſſian and Aſiatic merchants are permitted, on paying a certain duty, to ſell their goods by wholeſale or retail; and all European merchants are allowed to bring their goods from the harbours and frontier towns to Orenburg; 180 miles S. of Upha. N. lat. 51° 42'. E. long. 55° 14'.

ORENSE, AURIA, or *Aquæ Calidæ*, a city of Spain, in Galicia, ſo ranked as the ſee of a biſhop, ſituated at the foot of a mountain, upon the left bank of the Minho. In the time of the Gothic princes, the biſhop was ſuffragan to the archbiſhop of Braga in Portugal; but after the invaſion of the Moors, he became dependent on the archbiſhop of Compoſtella. Its hot ſprings were famous in ancient times; whence it obtained the name of "Aquæ Calidæ;" and it is ſaid that they have an effect on the temperature of part of the town, and the adjacent country. The town is ſmall, but airy and tolerably well built; its ſtreets are ſtraight, and its ſquares regular. It has a cathedral and pariſh church, and a chapter, the members of which are numerous. Here are alſo two convents of monks; one that belonged to the ancient Jeſuits; two chapels; a houſe of inſtruction for girls; an hoſpital for the ſick poor; and an aſylum. The population is calculated at 2300 perſons. Here is a remarkable bridge of one arch, ſo lofty that a ſhip can paſs under it. The plain of Orenſe is beautiful, pleaſant, and fertile, abounding with excellent grapes and good fruits; 37 miles S.E. of Compoſtella. . lat. 42° 25'. W. long. 7° 53'.

OREO, a town of the iſland of Negropont; 44 miles N.N.W. of Negropont. N. lat. 39° 7'. E. long. 23° 18'.

OREOBOLUS, in *Botany*, from ὀρος, *a mountain*, and βωλος, *a maſs*, *lump*, or *clod*, alluding to its place and form of growth. Brown Prodr. Nov. Holl. v. 1. 235. Claſs and order, *Triandria Monogynia*. Nat. Ord. *Calamariæ*, Linn. *Cyperoideæ*, Juſſ. *Cyperaceæ*, Br.

Eſſ. Ch. Glumes two, ſpathaceous, deciduous, including one floret, ſometimes accompanied by an inner ſcale. Corolla (perianth of Brown) in ſix deep ſegments, cartilaginous, remaining after the fall of the fruit. Style deciduous. Stigmas three. Nut cruſtaceous.

1. O. *Pumilio*. Gathered by Mr. Brown in Van Diemen's land. A dwarf plant, forming broad, denſe, convex tufts, on the ſummits of the mountains. *Stems* divided in the lower part, denſely clothed with imbricated, ſtraight, ſheathing, ribbed, ſpreading, linear *leaves*, dilated at their baſe. *Stalks* axillary, ſhort, compreſſed, ſingle-flowered. The *glumes* compoſe a two-valved two-edged ſheath.

OREOCALLIS, ſo named by Mr. Brown, from ὀρος, *a mountain*, and καλος, *beautiful*. Brown Tr. of Linn. Soc. v. 10. 196. Claſs and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceæ*, Juſſ.

Eſſ. Ch. Corolla irregular, ſplit on one ſide, four-toothed. Stamens ſunk in the concave tips of the corolla. Nectariferous gland none. Germen ſtalked. Stigma oblique, orbicular, dilated, rather concave. Follicle cylindrical. Seeds numerous, with a terminal wing.

1. O. *grandiflora*. Embothrium grandiflorum; Lamarck Dict. v. 2. 354. Willd. Sp. Pl. v. 1. 538. (E. emarginatum; Ruiz and Pavon Fl. Peruv. v. 1. 62. t. 95.)—Native of the colder mountains of Peru. A perfectly ſmooth *ſhrub*, twelve feet high. *Stem* erect, branched, the branches round, granulated. *Leaves* ſcattered, ſtalked, elliptic-oblong, four inches in length, coriaceous, ſlightly revolute, entire, emarginate, with a minute point, ſingle-ribbed, with many tranſverſe veins. *Cluſters* terminal, ſolitary, erect, denſe, of numerous roſe-coloured *flowers* in pairs, each pair with a minute *bractea* at the baſe of their partial ſtalks, but no general *involucrum*. This ſplendid plant flowers in September and October, when it is uſed to ornament the temples and idols of the Peruvians. Its habit is altogether like that of the *Embothrium coccineum* of Forſter and Linnæus, and of the *E. ſpecioſiſſimum* of Smith, New Holl. Bot. t. 7. Sims in Curt. Mag. t. 1128. We preſume to think there ought to be no generical diſunion of theſe plants, though the preſent wants the nectariferous gland beneath the germen, which the others have. The *ſtigma* indeed, which is vertical and club-ſhaped in *Embothrium*, ſeems a moſt important mark.

OREON, a name given by the ancients to a kind of horſe tail which they found growing on the mountains in wet and damp places. It is to this ſpecies that many authors have attributed the principal virtues of the genus; and this ſeems to have been the ſame with our great water horſe-tail. Neophytus ſays, that it roſe up with a ſingle ſtalk reſembling a young reed, and that this was compoſed of ſeveral joints, which, in the manner of cups, were inſerted one into another; and that from theſe joints the leaves grew, and that they reſembled thoſe of the pine-tree. The branches are what this author calls leaves, and they do pretty well reſemble the leaves of the pine-tree. They are long and ſlender, and of a bright green. Our great horſe-tail loves the heads of ſprings in hilly countries, and is always moſt plentiful in ſuch places.

OREOSELINUM. See ATHAMANTA.

ORES, in *Geography*, a town of the iſland of Sardinia; 16 miles S.S.E. of Oreſtagni.

ORESA, a town of Lithuania, in the palatinate of Novgorod; 18 miles E.N.E. of Sluck.

ORESME, NICHOLAS, in *Biography*, an eminent French prelate, and one of the moſt celebrated writers in the 14th century, was born at Caen in Normandy. He purſued his ſtudies at the univerſity of Paris, where he entered himſelf a member of the college of Navarre, and was in due time admitted to the degree of doctor by the faculty of the Sorbonne. In 1355, he was elected grand maſter of the college in which he was educated; and Mr. Launoy ſays that he greatly contributed to the revival of learning in that ſeminary. He roſe ſucceſſively to various high ſtations in the church; and in 1360, king John appointed him preceptor to his ſon Charles, who became the fifth king of France of that name. In 1363, he was ſent to tranſact affairs of importance with pope Urban V., and the college of cardinals at Avignon, and on this occaſion he ſignalized himſelf by a diſcourſe which he delivered before the pope and cardinals, in which he inveighed bitterly againſt the ſcandalous irregularities of the papal court. This diſcourſe was publiſhed by Geſner at Wittemberg in 1604. Oreſme next excited much attention by another "Diſcourſe concerning the Changes in the Value of Money," in which he cenſured the conduct of thoſe princes who coined money below the juſt ſtandard, and maintained that they had no power to increaſe or depreciate the value of money at their arbitrary pleaſure. This diſcourſe is inſerted in the twenty-ſixth volume of the Bibl. Patr. Upon the acceſſion of Charles V. to the throne he loaded his former tutor with favours, and conſulted him on the moſt important affairs of government. In 1377, he nominated him to the biſhopric of Liſieux, over which he preſided till his death, in the year 1382. His acquaintance with divinity, philoſophy, the mathematics, and the belles lettres, was very extenſive, and profound for the age in which he lived. De Launoy, Dupin, Huet, and others contend that he tranſlated the Bible into French by order of Charles V.; but others, among whom is father Simon, in his "Critical Hiſtory of the Verſions of the New Teſtament," maintain that it was the work of Des Moulins, canon of Aire, who lived a hundred years before Oreſme, and ſome ſay it was done by Raoul des Preſles, an eminent contemporary of our author. It is not in our power to give any deciſion on this ſubject. Oreſme tranſlated into French Ariſtotle's "Morals and Politics," by order of Charles V.: he was likewiſe the tranſlator of ſome parts of Cicero's works; and the treatiſe of Petrarch, "De Remediis Utriuſque Fortunæ." He was author of many original pieces, among which were three treatiſes againſt judicial aſtrology. Moreri.

OREXIS, APPETITE. The appetite, when exceſſive, or otherwiſe vitiated, is diſtinguiſhed by medical writers into ſeveral kinds, and deſcribed under ſeveral names, according to its difference in degree, and other particulars.

The firſt kind is the *Addephagia:* this is the name given to that ſpecies in which the food is not only eaten in too large a quantity, but is ſwallowed in a particularly ravenous manner.

The ſecond is the *Orexis Canina:* in this caſe the patient is continually eagerly longing for food; and if it is not ready ſo ſoon as he deſires, he is ſubject to fainting-fits; after the recovery from which he does not feel the ſame craving appetite. See BULIMY.

The third is the *Pica*, or *Sitta:* this is the caſe when the patient has an eager appetite to things not fit for food; ſuch as chalk, cinders, tobacco-pipes, and the like.

The fourth is the *Malacia:* this is diſtinctively made the name of that ſpecies of exceſſive appetite in which the patient has a great deſire for ſome particular things, but thoſe of the nature of common food, and uſually of the nicer and more delicate kind. See APPETITE.

OREYPOUR, in *Geography*, a town of Hindooſtan, in Marawar; 25 miles N. of Ramanadporum.

OREZA, a town of the iſland of Corſica, in the department of Corte. The canton contains 4345 inhabitants.

ORFANEL, HYACINTH, in *Biography*, a Spaniſh Dominican monk, who became a martyr to his zeal for propagating the Catholic faith in Japan, was born in the kingdom of Valencia in the year 1578. He entered, when very young, into the order of St. Dominic; and in the year 1605, was ſent out a miſſionary to the Philippine iſlands. From thence he went to Japan, where he chiefly applied himſelf to the inſtruction of the poor, among whom he made many converts to the Catholic religion. While thus engaged, in what he conſidered a good cauſe, he endured great privations and ſufferings, and was at length arreſted, brought to a mock trial, and condemned to be burnt alive. This was in the year 1622. He contributed very much to the collection of miſſionary travels among the Pagans of the Eaſt, a work that was written in the Spaniſh language, which relates to a country little known to Europeans, and is ſaid to abound in curious and intereſting matter. So careful was the author to render his work perfectly accurate, that while he

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was in priſon, he read it to his fellow miſſionaries, who aſſiſted him in correcting any miſtakes into which he might have fallen. It was printed at Madrid in 1633, and is entitled "The Eccleſiaſtical Hiſtory of the Succeſs of Chriſtianity in Japan from the Year 1602 to 1621, and continued to the End of the Year 1622 by father Diego Collado." Moreri.

ORFAR, a town of Scotland, on the S. coaſt of the iſland of Pomona; ten miles S.W. of Kirkwall.

ORFFYREUS's Wheel, in *Mechanics*, is a machine ſo called from its inventor, which he imagined to be a perpetual motion. This machine, according to the account given of it by M. s'Graveſande, in his "Œuvres Philoſophiques," publiſhed by Allamand, Amſt. 1774, conſiſted of a large circular wheel, or rather drum, twelve feet in diameter, and fourteen inches in depth, and very light; as it was formed of an aſſemblage of deals, the intervals between which were covered with waxed cloth, in order to conceal the interior parts of it. The two extremities of an iron axis, on which it turned, reſted on two ſupports. On giving the wheel a ſlight impulſe in either direction, its motion was gradually accelerated; ſo that after two or three revolutions it acquired ſo great a velocity as to make twenty-five or twenty-ſix turns in a minute. This rapid motion it actually preſerved during the ſpace of two months, in the chamber of the landgrave of Heſſe, the door of which was kept locked, and ſealed with the landgrave's own ſeal. At the end of that time it was ſtopped, to prevent the wear of the materials. The profeſſor, who had been an eye-witneſs to theſe circumſtances, examined all the external parts of it, and was convinced that there could not be any communication between it and any neighbouring room. Orffyreus, however, was ſo incenſed, that he broke the machine in pieces, and wrote on the wall, that it was the impertinent curioſity of profeſſor s'Graveſande which made him take this ſtep. The prince of Heſſe, who had ſeen the interior parts of this wheel, being aſked by s'Graveſande, whether, after it had been in motion ſome time, there had been any change obſervable in it, or whether it contained any pieces that indicated fraud or deception, anſwered both queſtions in the negative, and declared that the machine was of a very ſimple conſtruction.

ORFO, in *Geography*, a town of Africa, in the diſtrict of Labadde, on the Gold Coaſt.

ORFORD, or Oreford, a borough and market town in the hundred of Plomeſgate, and county of Suffolk, England, is ſituated on the north-weſt bank of the river Ore, from which it certainly derived its name. It was formerly a place of much greater conſequence than at preſent, and previous to the year 1500, contained three churches; but of theſe only one remains. In 1359 this town ſent three ſhips and ſixty-two men to aſſiſt Edward III. in the ſiege of Calais. Here, according to the "Suffolk Traveller," was a houſe of Auguſtine friars, an hoſpital of St. Leonard, and a chantry, which was valued at the diſſolution at 6*l.* 13*s.* 11½*d.*; and there are ſeveral lanes within the borough, and in its immediate vicinity, ſtill called ſtreets, though almoſt entirely deſtitute of houſes. The decay of the town is attributed to the loſs of its harbour, as the ſea has retired from this part of the coaſt.

The corporation of Orford conſiſts of a mayor, recorder, town clerk, eighteen portmen, twelve capital burgeſſes, and two ſerjeants at mace. Two members are ſent hence to parliament, in which the town appears to have been firſt repreſented in the reign of Edward I. Neglecting, however, to exerciſe its elective franchiſe during a long ſeries of years, it loſt this privilege, but it was reſtored by Richard III., who granted to Orford a charter of incorporation, and conferred on it many important immunities. Its market is on Monday, weekly, and there is a fair on the 24th of June: that formerly held on Shrove Monday is diſcontinued. This town gave the title of earl to admiral Ruſſell, who was elevated to the peerage by William III. Becoming extinct in that family, the ſame dignity was conferred on the celebrated ſir Robert Walpole, and continued in his family till the year 1797, when it again became extinct, by the demiſe of Horatio, the fourth earl, without iſſue. It has ſince, however, been once more revived, in the perſon of Horatio baron Walpole of Wolterton.

The church of Orford is of great antiquity, and was, when entire, a ſpacious and very handſome ſtructure. At the weſt end riſes a ſquare embattled tower, having under it the principal entrance, which is adorned on the outſide with ſhields, and a croſs over the centre, and in the interior with king's heads, five on one ſide, and ſix on the other. The chancel, now much more ruinous than any other part of the church, and ſeparated from it by a wall, exhibits in its remains a very curious ſpecimen of ancient architecture. In the more entire portions of this edifice the arches are in the pointed ſtyle, and the windows are ornamented with beautiful tracery, in good preſervation.

The other public buildings in Orford, beſides the church, are a town-hall and an aſſembly houſe.

On an eminence on the weſt ſide of the town ſtand the ruins of the caſtle, which was moſt likely founded ſoon after the Norman conqueſt, though neither the exact period, nor the name of the founder, are recorded. This fortreſs is traditionally ſaid to have been the centre of the town in ancient times; a report rendered extremely probable by the fact, that many foundations of buildings are frequently diſcovered in the ſurrounding encloſures, ſome of which likewiſe retain the name of ſtreets annexed to their denomination of field. The preſent remains of the caſtle conſiſt chiefly of the keep. The figure of this building is a polygon of eighteen ſides, deſcribed within a circle, whoſe radius is twenty-ſeven feet, and flanked by three ſquare towers, ſituated at equal diſtances on the weſt, north-eaſt, and ſouth-eaſt ſides. Theſe are embattled, and overlook the reſt of the edifice, which riſes to the height of ninety feet. The outer walls meaſure twenty feet in thickneſs, and are ſolid towards the baſe, but galleries and ſmall apartments are formed in them towards the upper part. Round the whole run two circular ditches, which were formerly ſeparated by a circular wall, now almoſt entirely demoliſhed. From the view of the caſtle, however, publiſhed by Groſe, we learn that this wall was forty feet high, and had a parapet and battlements. The entrance into the fortreſs was, on the ſouth-caſt part of the polygon, through a building adjoining to one of the towers.

When mention of Orford caſtle firſt occurs in hiſtory, it belonged to the crown. In 1215, Hugh Bigod and John Fitz Robert were appointed governors both of Norwich and Orford caſtles; but were removed the ſame year, and Hubert de Burgh nominated in their ſtead. After the battle of Lewes, at which Henry III. was taken priſoner by his barons, they conferred the command of this poſt on Hugh le Deſpenſer. It next paſſed into the cuſtody of the deſcendants of Peter de Valoines, one of whom, Cecilia, daughter of Robert de Valoines, married Robert de Ufford, who had a grant of the caſtle and manor for life. William de Ufford died ſeiſed of it in the reign of Richard II., and Iſabel, his wife, had it aſſigned among other things for her dowry. Upon her death it reverted to Robert lord Willoughby, a deſcendant, by the female line, from Robert de Ufford, and continued

tinued in that family till the reign of Henry III. It deſcended afterwards to Michael Stanhope, and in his right to viſcount Hereford, whoſe truſtees ſold it to the father of the marquis of Hertford, the preſent owner.

Sudborne Hall, a ſeat of the marquis, ſtands about a mile north-eaſt from the town. It is a plain building, and chiefly uſed as a ſporting reſidence, for which purpoſe it is excellently ſituated, the park and neighbourhood abounding with game. The Suffolk Traveller, by John Kirby, 2d edit. Lond. 1764. Beauties of England and Wales, vol. xiv.

ORFORD, a poſt-town of America, in Grafton county, New Hampſhire, on the E. bank of Connecticut river, about 15 miles N. of Hanover, and oppoſite to Fairlee in Vermont: incorporated in 1761, and containing 988 inhabitants. Here are the ſoap-rock, which has the property of fuller's earth in cleaning cloth, alum ore, free-ſtone fit for building, and a grey ſtone, much uſed for mill-ſtones, and reckoned equal in quality to the imported burr-ſtones.—Alſo, a townſhip in Lower Canada, W. of Aſcot, having about 30 inhabitants. In the northern part is a conſiderable lake, and another in the ſouthern part of the townſhip.

ORFORD, *Cape*, the north-weſternmoſt of the large iſlands to the W. of Falkland's ſound in the Falkland iſlands, in the Atlantic ocean, and S.E. of Cape Percival.

ORFORD, *Townſhip of*, lies in Suffolk county, Upper Canada: to the N. and S. is the reſidence of the Moravians: on the S. it is bounded by lake Erie, and towards the N. watered by the Thames.

ORFORDNESS, a cape of England, on the S.E. coaſt of the county of Suffolk, in the German ſea, where a light-houſe is erected for the direction of ſhips. N. lat. 52° 4′. E. long. 1° 6′.—Alſo, a cape on the E. coaſt of New Holland. N. lat. 11° 15′. W. long. 218° 9′.

ORFUS, in *Ichthyology*, a ſpecies of *Cyprinus*; which ſee.

ORGABRA, in *Geography*, a town of Africa, in the kingdom of Magadoxa.

ORGAL, or ARGOL, the lees of wine dried, and uſed by dyers to prepare the cloth for the more readily taking their ſeveral colours. See TARTAR.

ORGAN, Οργανον, is uſed in the general for any thing framed and deſtined for ſome certain action, uſe, or operation.

ORGAN, or *Organical Part*, in *Phyſiology*, is ſuch a part of the body as is capable of the performance of ſome perfect act, or operation.

In which ſenſe all the parts, even the moſt ſimple, may be denominated *organical*.

The organs are divided into *primary* and *ſecondary*. The *primary* are thoſe compoſed of ſimilar parts, and appointed for ſome one ſingle function. Such as conſiſt of ſeveral of theſe, though appropriated to one ſingle action, are eſteemed *ſecondary* organs.

Thus the veins, arteries, nerves, and muſcles, are *primary* organs; and the hands, fingers, &c. are *ſecondary* organs.

ORGAN *of Senſe*, is that part of an animal body, by means of which it perceives external objects.

Theſe, ſome divide into *internal*, which is the brain; and *external*, *viz.* the eye, ear, noſe, &c.

ORGAN, in *Fortification*. See ORGUES.

ORGAN, in *Muſic*, the name of the largeſt, moſt comprehenſive, and harmonious of muſical inſtruments; on which account it is called "the organ," οργανον, "the inſtrument" by way of excellence. The invention of the organ is very ancient, though it is agreed, it was little uſed till the eighth century. It ſeems to have been borrowed from the Greeks. Vitruvius deſcribes one in his tenth book. The emperor Julian has an epigram in its praiſe. St. Jerom mentions one with twelve pair of bellows, which might be heard a thouſand paces, or a mile; and another at Jeruſalem, which might be heard to the mount of Olives.

Ancient annaliſts, ſays Dr. Burney, are unanimous in allowing, that the firſt organ which was ſeen in France was ſent from Conſtantinople, as a preſent from the emperor Conſtantine Copronymus VI. in 757, to king Pepin; which, as well as Julian's epigram, gives the invention to Greece, where the hydraulicon had likewiſe its origin.

It has been a ſubject of debate, when the uſe of organs was introduced into the church. Bellarmine ſays, that they began to be uſed in the ſervice of the church, in the time of pope Vitalian, about the year 660, as Platina relates out of the Pontifical; or, as Aimonius thinks, after the year 820, in the time of Lewis the Pious. A learned writer has ſhewn, that neither of theſe dates can be juſt; alleging that Thomas Aquinas expreſsly ſays, that in his time, *i. e.* about the year 1250, the church did not uſe muſical inſtruments, leſt ſhe ſhould ſeem to judaize. Pierce's Vind. of the Diſſenters, ed. 1718, p. 395.

Bingham, in his Antiq. of the Chriſtian Church, vol. i. p. 314. folio ed. adds, that Marinus Sanutus, who lived about the year 1290, firſt brought the uſe of them into churches. However, it appears from the teſtimony of Gervas, the monk of Canterbury, who flouriſhed about the year 1200, that organs were introduced more than one hundred years before this time: in his deſcription of Lanfranc's church, as it was before the fire in 1174, he has theſe words, "Crux auſtralis ſupra fornicem organa geſtare ſolebat." Decem Scriptores, p. 1293, line 25.

Venerable Bede, who died in 735, ſays nothing of the uſe of organs, or other inſtruments, in our churches or convents, when he is very minutely deſcribing the manner in which the pſalms and hymns were ſung. However, according to Mabillon and Muratori organs became common in Italy and Germany during the tenth century, as well as in England; about which time they had admiſſion in the convents throughout Europe. Burney's Hiſt. Muſic, vol. ii. p. 66. 114.

Our elegant poet, the late Mr. Maſon, a good muſician, intereſted himſelf much in enquiries concerning the progreſs of the art, in his "Eſſays on Engliſh Church Muſic." He there gives ſeveral hiſtorical notices concerning the origin and progreſs of the organ, previous to its general admiſſion into our churches, partly extracted from a very voluminous work, entitled "L'Art da Facteur des Orgues, par D. Bedos de celles," a Benedictine monk, printed in 1766. We have not room to extract from Mr. Maſon's little work, and can only refer to it.

The complicated nature of the mechaniſm of an organ, renders it a very difficult taſk to give a clear deſcription of it. To make it more intelligible, we ſhall ſeparately deſcribe the ſeveral parts; and then, by referring the reader to a plate of the interior of a church organ, ſhew the diſpoſitions and uſes of them when put together.

The modern organ conſiſts of ſeveral parts; *viz.* the bellows, the porte vent, or wind trunk, the wind cheſt and its furniture, the ſound boards, the ſliders, the ſtock and rack boards, the pipes, the key and draw-ſtop movements.

The bellows are of two kinds, ſingle and double; the former are commonly uſed in church organs, the latter in chamber organs. Single bellows conſiſt of two oblong boards, *a b*, *c d*, (*Plate* I. *Organ*, *fig.* 10.), connected at *b* by a joint of leather

leather or web, and at the other three ſides by thin folds of wood joined together with leather. The lower board is fixed, the upper moveable. In the lower board, at *e f*, is an aperture covered with a valve, (called by the organ builders a pallet,) opening inwards. At *g* is another aperture, covered with a hollow box *g d*, communicating with the wind trunk; upon the mouth of which, is another pallet opening outwards. When the upper board, *a b*, is raiſed by preſſing down the handle of the lever *h i*, the air enters the bellows at the aperture *e f*, and upon letting go the lever, is forced into the wind trunk at *d*, by the preſſure of weights placed upon the upper board. The pallet at *d* prevents the return of the wind from the wind trunk, when the upper board is raiſed. It will eaſily be ſeen, that it is neceſſary to have at leaſt two pairs of bellows of this kind, to keep up a conſtant ſupply of wind. Moſt of the Engliſh church organs have three; and many of the large German inſtruments (as Dr. Burney informs us) have twelve and even ſixteen pairs.

Double bellows are made with three boards; *a b*, (*fig.* 11.) the riſer; *c d*, the middle; and *e, f*, the feeder boards. At *g*, in the feeder, is an aperture, and pallet to receive the air; at *h*, in the middle board, is the pallet of communication; and at *i*, in the riſer, the waſte pallet, which is contrived to open, when the bellows are ſufficiently full. The riſer empties itſelf into the wind trunk at *c*. In old bellows of this kind, the riſer is connected with the middle board, in a manner ſimilar to the ſingle bellows; but it is now uſual to join them with folds of an equal breadth in all parts, ſo that the upper board, in riſing, is always parallel to the middle board. Theſe are called horizontal bellows; in contradiſtinction to thoſe which riſe diagonally. Their action is very ſuperior to thoſe of the old form. They afford a greater quantity of wind, in proportion to the caſe room they occupy; the preſſure is more equal; and they are not liable to jerk or quiver. Though lately brought into common uſe, they are by no means a modern invention, as Père Merſenne deſcribes them under the name of bellows "à la lanterné." L'Harmonie Univerſelle, folio, Paris, 1636.

The ſound board (*fig.* 12.) is made of an oblong frame, the upper ſide of which is covered by a ſtout board. In the two longeſt ſides of the frame, and in the under ſide of the board, grooves are dug, in which are fixed a number of bars of wood; dividing the box thus formed into parallel channels, completely ſeparated from each other. A number of holes, correſponding with the number of ranks of pipes of which the organ conſiſts, are bored through the upper ſide of the ſound board into each channel. The number of channels is regulated by the compaſs of the organ; there being uſually a channel to each finger-key.

The wind cheſt is attached to the under ſide of the ſound board. It is a box made air-tight in all parts, ſo that the wind, which it receives from the bellows through the wind trunks, cannot eſcape, except through the channels of the ſound board. Each of the channels within the wind cheſt is covered with a pallet, which opens downwards, and is cloſed by the action of a ſpring of braſs wire. The pallet is connected with the key movement by ſmall wire hooks, which paſs through a perforation in a braſs plate, upon the bottom of the wind cheſt. *Plate* I. *fig.* 2. ſhews a pallet with its ſpring, cheſt hook, and pull-down. All the under ſide of the ſound board, which is without the wind cheſt, is cloſely covered with leather, or parchment.

Upon the upper ſide of the ſound board are placed thin bars of wood, called the ſliders; extending the whole length of the ſound board, and pierced with holes, correſponding with thoſe bored through the ſound board, into the channels. Theſe ſliders, being moveable in grooves in a tranſverſe direction to the channels, admit, or exclude, the wind from any rank of pipes placed over them, as the holes correſpond with, or cover, thoſe of the ſound board. Laſtly, upon theſe are ſcrewed the ſtock boards; which are alſo bored with holes correſponding with thoſe in the ſliders and ſound board; in which the pipes are placed. The racks are thin boards mounted on ſmall pillars, pierced to receive the upper part of the feet of the pipes.

The key movement is a combination of rollers and levers, or of quadrants connected by wooden rods; ſo contrived, that each key, when preſſed down, may open its correſponding pallet in the wind cheſt, and ſo admit the wind to the pipes, ſtanding over the channel, which the pallet covers.

The draw-ſtop movement is alſo a combination of levers and rollers, ſo contrived, that each draw-ſtop may open or ſhut its correſponding ſlide; and ſo admit or exclude the wind from that rank of pipes to which it belongs. Thoſe ranks of pipes, which in the conſtruction of the inſtrument are ſo planted as to be ſubſervient to the action of one draw-ſtop, are called ſtops. A ſtop conſiſting of one row of pipes is called ſimple, of more than one compound.

The pipes are of four kinds, ſtopped, half ſtopped, (with a funnel or chimney at the top,) open and reed pipes. Various materials have been uſed for their conſtruction, but the moſt common practice is to make the ſtopped pipes of wood, and the open and reed pipes of a metal compoſed of tin and lead.

*Plate* I. *figs.* 1. and 2. repreſent the front and ſection of a ſtopped wooden pipe. In *fig.* 2. *a* is a ſquare block of wood, correſponding with the interior diameters of the pipe, upon which the back and two ſides are glued. In this a channel is cut, in the direction of the ſhaded line, for the paſſage of the wind, which entering at the foot *d*, paſſes through the channel in the block, and the cavity of the lip or top piece *b*, and ſtrikes upon the ſharp edge of the front at *e*, the mouth; *c* is a moveable wooden tompion, covered with leather to make it air-tight. When this is drawn outwards, the tone of the pipe is flattened, and when puſhed inwards, ſharpened.

*Figs.* 3. and 4. repreſent the front and ſection of an open metal pipe. *Fig.* 4. *d* is the foot, which is a hollow cone, and is ſeparated from the cylindrical body of the pipe *c*, by a partition called the langue, or tongue, *a*, which anſwers the purpoſe of the block in the wooden pipe. The wind paſſes through a narrow aperture at *b*, and ſtrikes upon the upper ſide of the mouth at *e*. A ſmall ear is uſually affixed on each ſide of the mouth, for the purpoſes of enriching the tone, and to tune ſuch pipes as ſtand in the ornamental front of the organ. Metal open pipes are tuned by opening the tops with a braſs cone, to ſharpen them; and by cloſing them with the inſide of the cone, to flatten them.

*Figs.* 5. and 6. are the front and ſection of an half ſtopped pipe, or pipe "à la cheminée." Theſe pipes are tuned by opening or cloſing the ears, which are made very large for this purpoſe.

*Fig.* 7. is the exterior of a reed pipe, conſiſting of two parts, the foot, *a*, and the tube or body of the pipe, *b*. The tube is foldered to a block of metal, *c*, (*figs.* 8. and 9.) which exactly fits into the upper end of the foot. In this is fixed a hollow demi-cylinder, *d*, of braſs, called the reed,

reed, ſtopped at the lower extremity, and communicating at the other with the body of the pipe. The open ſide of the reed, (the edges of which are filed perfectly flat and paralle',) is covered with a thin plate of hard braſs. called the tongue; one end of which is kept in its poſition by a ſmall wooden wed e *f*, and the other left at liberty to vibrate with the action of the wind. The degree of acuteneſs, or gravity of a reed pipe, depends jointly on the length of the tongue, and that of the pipe; meaſured from the extremity of the reed to the extremity of the tube. It is, therefore, neceſſary to have ſome method of altering the length of the reed, in order to tune the pipe. This is effected by pulling up, or puſhing down, the wire-ſpring *g*; which preſſing the tongue cloſely againſt the reed, ſhortens or lengthens the vibrating portion of it. The degree of gravity, or acuteneſs of any pipe, depends upon the length; meaſured in an open pipe, from the edge of the mouth to the extremity of the tube; and in a ſtopped pipe, from the edge of the mouth to the interior ſurface of the tompion. A ſtopped pipe is half the length of an open pipe of the ſame pitch.

The following liſt contains the names of the ſtops which are commonly uſed by Engliſh builders.

*Stopped Pipes.*—The bourdon, or double-ſtopped diapaſon, the ſtopped diapaſon, and ſtopped flute.

*Open Pipes.*—The preſtant, or double open diapaſon, the open diapaſon, dulciana, principal, open flute, twelfth, fifteenth, tierce or ſeventeenth, larigot or nineteenth, and twenty-ſecond.

*Reed Pipes.*—The trumpet, clarion, baſſoon, hautboy, French horn, cremona, and vox humana.

Compound ſtops, uſually conſiſting of open pipes, are the cornet, ſeſquialtera, furniture, mixture and ſupplement.

The organ has from one ſet of keys, in chamber organs, to four or five ſets, in the largeſt church organs. Each of theſe ſets of keys acts upon a ſeparate organ, which has nothing in common with the others, except the caſe and bellows.

The number of keys, or compaſs of the organ in the time of father Schmidt, was commonly confined to four octaves; from double C in the baſs, to *c* in alt. To theſe, two notes, G G and A A, were ſometimes added to the loweſt octave. An organ of this compaſs is ſaid to have ſhort octaves. When the keys are extended to G G in regular ſucceſſion, the organ is ſaid to have long compaſs. The modern builders have extended the keys upwards to *f* in alt$^{mo}$.

Beſides the manuals or keys for the hand, there are, in large church organs, pedals, or keys played with the feet; ſaid to be the invention of Bernard, a German, about the year 1400. Theſe command certain pipes, which, to increaſe the harmony, are tuned an octave below the diapaſon. It is much to be lamented, that the Engliſh builders have not followed ſome certain and invariable rule for the poſition of their pedals, as they do for their keys. Scarcely two organs in the kingdom have their pedals alike; either with reſpect to number or poſition; ſo that every performer who comes to an organ, with which he is not previouſly acquainted (be he ever ſo ſkilful in the uſe of pedals), has the whole of his buſineſs to learn again. The diſpoſition of the pedals of the fine organ in St. Paul's cathedral, might ſerve as a model for all other Engliſh organs. Each octave of the pedals occupies the ſpace of two octaves of the finger-keys; and the C's are placed under each other, as repreſented in *Plate* I. *fig.* 13.

*Plate* II. repreſents the interior of an Engliſh church organ, ſeen in profile. It has three rows of keys. The upper row is appropriated to the ſwell, the middle to the great or chorus organ, and the lower to the choir or ſoft organ. The ſwell is ſaid to be an Engliſh invention, and Dr. Burney, in his Tour through Germany, ſays that he found only one organ in which a ſwell had been attempted, and that in a very imperfect manner. The ſwell has its pipes incloſed in a ſtout wooden box, with a ſliding door; which being gradually opened by the preſſure of the performer's foot, the ſound is increaſed, and is diminiſhed by a contrary motion. The ſwelling organ is commonly placed in the upper part of the caſe, either over the great organ, or over the choir, as repreſented in the plate.

The great organ is commonly placed in the fore part of the caſe, for the convenience of planting the largeſt pipes in the ornamental front; and that it may appear louder.

The choir organ is ſometimes placed in the poſition drawn in the plate; and ſometimes in front of the great organ, in a ſeparate caſe, at the back of the player. Hence it is not unfrequently called the chair organ.

The key movement of the choir organ, as repreſented in the plate, is of that kind called the *long* movement; becauſe it may be extended to an almoſt indefinite length. It was uſed for the organ at the commemoration of Handel in Weſtminſter Abbey; when the keys were 23 feet from the organ; and 19 feet below the level of the common key frames. The c nſtruction muſt be obvious to any one who has obſerved the common method of hanging bells. The trackers in the organ are of wood, inſtead of wire.

The organ at Haarlem, the moſt celebrated inſtrument in Europe, has been already deſcribed, from an actual ſurvey. (See HAERLEM.) But the liſt of the ſtops we reſerved for the general article organ.

Catalogue of the Stops in the great Organ at Haarlem, built by Müller, 1738.

Great Manual.

| No. Names. | Length of longeſt Pipe. | Engliſh Equivalents. |
|---|---|---|
| 1. *Preſtant*, | 16 feet. | Open double diapaſon. |
| 2. *Bourdon*, | 16 | Stopt ditto. |
| 3. *Octave*, | 8 | Open diap. |
| 4. *Viol da Gamba*, | 8 A narrow pipe which imitates the whiſtling of the bow. | Uniſon with ditto. |
| 5. *Roer Fluit*, | 8 With a funnel, or ſmall pipe, upon the top. | Diap. half ſtopt. |
| 6. *Octave*, | 4 | Principal. |
| 7. *Gem's Hoorn*, | 4 A kind of flute, the pipes narrow at the top. | Uniſon with ditto. |
| 8. *Roer-Quint*, | 6 | Twelfth half ſtopt. |
| 9. *Quint*, | 3 | Fifth. |
| 10. *Tertian*, | 2 ranks. | Tierce or 17th. |
| 11. *Mixture*, 6, 8, and 10 ranks. | | Furniture, or mixture. |
| 12. *Wood Fluit*, | 2 feet. Stopt pipe, uniſon with the | Fifteenth, or octave flute. |
| 13. *Trumpet*, | 16 | Double trumpet, |
| 14. *Trumpet*, | 8 Reed ſtops. | Trumpet. |
| 15. *Trumpet*, | 4 | Clarion. |
| 16. *Hautbois*, | 8 | Hautbois. |

## Upper Manual.

| No. Names. | Length. | Engliſh Names. |
|---|---|---|
| 1. *Preſtant,* | 8 feet. | Open diapaſon. |
| 2. *Quintadecna,* | 16 Breaks into a 5th, which predominates. | Double diap. |
| 3. *Gem's-Hoorn,* | 8 | Unif. with ſtopt diap. |
| 4. *Baar pyp.* | A muffled pipe uſed with the *vox humana.* | Bear pipe. |
| 5. *Octave,* | 4 | Principal. |
| 6. *Flag Fluit,* | 4 Reed-flute. | Flute. |
| 7. *Naſſat,* | 3 | Stopt twelfth. |
| 8. *Nagt-Hoorn,* | 2 *Night-horn;* but why ſo called, no reaſon can be given. | Flute. |
| 9. *Flageolet,* | 1½ | Octave twelfth. |
| 10. *Seſquialter,* | 2 ranks Tuned octave and 12th to the diap. | Seſquialter. |
| 11. *Cimbaal,* | 3 ranks. | Octave to mixture. |
| 12. *Mixture,* 4 and 6 ranks. | A ſeries of eight notes repeated thro' the inſtrument. | Mixture. |
| 13. *Schalmay,* | 8 Reed ſtop. | Bagpipe. |
| 14. *Dulcian,* | 8 A narrow delicate pipe, uniſon with the diap. | Dulcian. |
| 15. *Vox humana,* | 8 An imitation of the | human voice. |

## Poſitif, or ſmall Organ.

Loweſt Set of Keys.

| No. Names. | Length. | Engliſh Names. |
|---|---|---|
| 1. *Preſtant,* | 8 feet. | Open diapaſon. |
| 2. *Holfluit,* | 8 | Diap. half ſtopt. |
| 3. *Quintadeena,* | 8 | Ditto. |
| 4. *Octave,* | 4 | Principal. |
| 5. *Flute.* | 4 | Flute. |
| 6. *Speel Fluit,* | 3 | Twelfth. |
| 7. *Seſquialter,* | 2, 3, and 4 ranks. | |
| 8. *Super-Octave,* | 2 feet. | Fifteenth. |
| 9. *Scherp,* | 6 and 8 ranks. | High mixture. |
| 10. *Cornet,* | 4 ranks. | |
| 11. *Cimbaal,* | 3 ranks. | Octave mixture. |
| 12. *Fagotte,* | 16 feet. | Double baſſoon. |
| 13. *Trumpet,* | 8 | |
| 14. *Regaal,* | 8 Formerly a portable organ uſed in proceſſions, was called a *regal;* the ſtop in this organ is entirely compoſed of reeds. | Regal. |

## Pedals.

| No. Names. | Length. | Engliſh Names. |
|---|---|---|
| 1. *Principal,* longeſt pipe 32 feet. | | Octave below the double diapaſon. |
| 2. *Preſtant,* | 16 | Double diap. open. |
| 3. *Subbas,* | 16 | Ditto, ſtopt. |
| 4. *Roer Quint,* | 12 | Fourth below the diap. ſtopt. |
| 5. *Holfluit,* | 8 | Diap. half ſtopt. |
| 6. *Octave,* | 8 | Open diap. |
| 7. *Quint-Preſtant,* | 6 | Fifth. |
| 8. *Octave,* | 4 | Principal. |
| 9. *Ruiſch-Quint,* | 3 ruſh *or* reed | Twelfth. |
| 10. *Holfluit,* | 2 | Fifteenth. |
| 11. *Bazuin,* | 32 By the Germans called *Poſaune,* a reed ſtop. | Double Sacbut. |
| 12. *Bazuin,* | 16 | Sacbut. |
| 13. *Trumpet,* | 8 | Trumpet. |
| 14. *Trumpet,* | 4 | Clarion. |
| 15. *Cink,* | 2 A cornet, horn, or ſhawm, | Octave Clarion. |

This organ has 60 ſtops, two tremulants, two couplings, or ſprings of communication, four ſeparations or valves to cloſe the wind cheſt of a whole ſet of keys, in caſe of a *cipher,* and 12 pair of bellows.

Upon the whole, it is a noble inſtrument, though we think that of the New church at Hamburg is larger, and that of the Old Kerk, in Amſterdam, better toned; but all theſe enormous machines ſeem loaded with uſeleſs ſtops, or ſuch as only contribute to augment noiſe, and to ſtiffen the touch.

As this organ contains many ſtops, which are altogether unknown to Engliſh builders, and not to be found in the organs of this kingdom, we have ſubjoined a liſt of the ſtops of the organ at Great Yarmouth, as this noble inſtrument contains nearly all the variety of ſtops with which our workmen are acquainted.

*Great Organ.*

Cornet.
Clarion.
Trumpet.
Trumpet.
Furniture, 3 ranks.
Seſquialtera, 5 ranks.
Tierce.
Fifteenth.
Twelfth.
Principal.
Open Diapaſon.
Open Diapaſon.
Stop Diapaſon.
Double Diapaſon.

*Choir Organ.*

Vox Humana.
Vox Humana.
Mixture, 2 ranks.
Stop Flute.
Principal.
Open Diapaſon.
Stop Diapaſon.
Double Diapaſon.

*Swell Organ.*

Clarion.
Trumpet.
French Horn.
Cornet.
Principal.
Open Diapaſon.
Stop Diapaſon.

The organ was built by Jordan, Bridge, and Byfield, in the year 1740, though roughly repaired, and ſome ſtops added, by Mr. G. P. England, in 1812.

Compaſs of the great and choir organs from G G, to *f* in altiſſimo; of the ſwell from C below middle, to *f* in altiſſimo. Pedals from G G G, to C C.

Thoſe who wiſh to be further informed in the hiſtory and practice of organ building, are referred to L'Harmonie Univerſelle, folio, Paris, 1636; Harmonicorum Libri Duodecimi, folio, Paris, 1648; Facteur d'Orgues, Paris, 1766; and Mr. Maſon's Eſſays on Engliſh Church Muſic.

The organs in our churches, that have been well preſerved of father Schmidt's make, ſuch as St. Paul's, the Temple,

St. Mary's, Oxford, Trinity college, Cambridge, &c. are far ſuperior in tone to any of more modern conſtruction; but the mechaniſm has been improved during the laſt century, by Byfield, Snetzler, Green, Gray, &c. The touch is lighter, the compaſs extended, and the reed-work admirable. The dulciana ſtop, brought hither by Snetzler, is a tall, delicate, narrow pipe, of an exquiſite ſweet tone, without a reed; on which account it ſtands in tune equally well with the open diapaſon. Though the beſt keyed-inſtruments in England have been made by Germans, they work here better than in their own country in ſize and number of ſtops; they greatly ſurpaſs us in the ſize of their organs, but the mechaniſm is infinitely inferior; which is accounted for by the workmanſhip being better paid here than in the German dominions, where labour is cheap.

The long keys of our old church organs were made of box or ebony, and the ſhort, or flats and ſharps, of ivory. But at preſent, the long keys, or natural notes, like thoſe in harpſichords and piano-fortes, are of ivory, and the flats and ſharps of ebony, or dyed pear-tree wood.

An organ, when complete for cathedrals, is of three-fold conſtruction, and furniſhed with three ſets of keys; one for what is called the great organ, and which is the middle ſet, a ſecond (or lower ſet) for the choir organ, and a third (or upper ſet) for the ſwell. In the great organ, the principal ſtops are known by the following names; the two diapaſons, the principal, the twelfth, the fifteenth, the ſeſquialtera, the mixture or furniture, the trumpet, the clarion, and the cornet. The choir organ uſually contains the ſtop diapaſon, the dulciana, the principal, the flute, the baſſoon, and the vox humana. The ſwell compriſes the two diapaſons, the principal, the hautboy, trumpet, and cornet. Beſides this complete organ, there are other organs of ſmaller ſizes and more limited powers, adapted to church, chapel, and chamber uſe. There is alſo the barrel, or chamber organ, which has the parts of other organs, with the addition of a cylinder, or barrel, revolving on pivots: on the circumference of this, by means of wires, pins, and ſtaples, are ſet the tunes it is intended to perform. Theſe pins and ſtaples, by the revolution of the barrel, act upon the keys, and give admiſſion to the wind from the bellows to the pipes. The barrel organ is frequently made portable, and ſo contrived, that the ſame action of the hand which turns the barrel ſupplies the wind, by giving motion to the bellows.

Of all muſical inſtruments, the barrel organ is the moſt eaſy of performance, as it merely requires a regular motion given to it by a handle. On this account, it is an inſtrument of very general uſe; and the recent improvements of ſome Engliſh artiſts have rendered the barrel capable of producing an effect equal to the fingers of the firſt-rate performers. Barrels are now very generally added to chamber organs, operating on the ſame pipes as the finger-keys, though by a different ſet of keys; ſo that either barrel or finger-keys may be uſed independently of each other. Many barrel organs are conſtructed on an extremely ſmall ſcale, motion being given to them by clock-work. The whole inſtrument is frequently concealed in ſome piece of furniture, and the clock, being previouſly wound up, is put in motion at pleaſure, by diſcharging a trigger, producing a very agreeable effect to thoſe unacquainted with the concealment.

In order further to explain the mechaniſm of an organ, we have procured ſections of a moſt ſuperb inſtrument of this kind, made by Meſſrs. Flight and Robſon of London, for the earl of Kirkwall. As a finger organ, this inſtrument does not contain any thing new in principle; but the perfection of its workmanſhip is ſuch, as to produce effects which the organ would never have been thought capable of before this inſtrument was completed, and publicly exhibited to immenſe numbers of viſitors, at Mr. Flight's houſe in St. Martin's Lane. The mechaniſm of the barrel part is extremely ingenious, containing many new movements, which are neceſſary to give this method of performance the ſame powers as a good organiſt has upon the finger-keys; in this, however, the inventor has ſucceeded to his wiſhes. *Plate* III. *Organ, figs.* 1 and 2. are two ſections of the whole inſtrument, the firſt being taken acroſs the length, ſhewing one of the finger-keys, with the manner of its communication with the valves and pipes ſituated in the upper part, and alſo a croſs ſection of the barrel in its proper ſituation. *Fig.* 2. is a ſection taken on a plane perpendicular to the other, that is parallel to the front of the inſtrument, and through its centre; ſo that the barrel and all its appurtenances are removed, and only the detents, &c. of the finger-keys exhibited. We ſhall firſt deſcribe thoſe parts which are common to all organs, that the reader may better comprehend the variations and improvements of the preſent inſtrument. The bellows for ſupplying the air are placed beneath the inſtrument, near the floor at A B C in both figures; theſe throw a conſtant ſupply of air into the large chamber D, which ſerves as a regulator to receive it and equalize its preſſure, for which purpoſe it is termed the reſervoir: from this the air is conducted through the wind trunk E, to the wind cheſt F: from the top of this cheſt paſſages are conducted up to the various pipes ſituated at G, H, I, K, L, M. The paſſages are cloſed by valves within the cheſt at *k*, (*fig.* 1.) and a whole row of them may be ſeen in *fig.* 2: from theſe valves ſmall wires, *l*, deſcend, and by levers, N, communicate, by the rods Q, with the finger-keys O, P: the extremity, P, (*fig.* 1.) of one of theſe being preſſed down, elevates the front end of one of the levers N, and pulling the wire, *l*, at the other end, opens the valve *k*, and admitting air from the wind cheſt into the pipe above, it produces the ſound proper for that key.

Having given our readers a general idea of the diſpoſition of the parts, we ſhall proceed to a particular deſcription of the conſtruction of each. The bellows at A B C conſiſt of a moving board *a b*, (*fig.* 1.) having valves in it ſhutting downwards, to take in the air; it is connected by leather, glued all round its edges, with a large board *c c*, which as it extends beneath the whole inſtrument, and is united with its frame, may be called its floor or bottom. The floor has holes through it covered by valves, ſhutting downwards. The chamber formed by the ſpace between the floor and the moving board *a b*, is divided into two ſeparate compartments by a vertical partition above *d*, extending from one board to the other: the board, *a b*, is jointed by hinges and leather to this partition at the point *d*, and when worked, vibrates on this joint as a centre, enlarging one chamber and diminiſhing the other; which operation, by the arrangement of the valves, throws a conſtant ſtream of air into the reſervoir, D, of the bellows. Thus, ſuppoſe the end, *a*, of the board aſcending, and the other, *b*, deſcending, then the valves in *b* will be open to take a ſupply of air into their chamber. The valves in *a* will be ſhut, and the air included in that chamber is forced up through the valves, in the middle board *c*, into the reſervoir D, which is ſituated above it. Though we have only mentioned one pair of theſe double bellows, there are in reality three pair, all made exactly alike; they are denoted by the letters A, B, C, *fig.* 2. The middle bellows B, which are much wider than the other two, are intended to be worked by the foot of the performer, by means of a treadle, which comes out in front of the inſtrument, beneath the key-board, as denoted by the dotted lines *b*, *fig.* 1. The other two pair, A and C, are worked by the

ſame handle as the barrel: when it is uſed, this handle is applied to a ſpindle *w*, (*fig.* 1.) proceeding acroſs the whole inſtrument, and communicating motion to the barrel by means of wheelwork we ſhall deſcribe: on the other extremity of this ſpindle is a fly-wheel *x*, to regulate the movement, and a crank, which by a rod, *z*, communicates motion to one end of the bellows C, at the end *a*, *fig.* 1. There is alſo another crank at *z*, bent at right angles to the former: this crank communicates, by a horizontal rod, with a bent lever behind the inſtrument, which works the other pair of bellows at A, ſo that both pair, A, C, are in conſtant motion.

The reſervoir, D, is the ſize of the whole floor of the organ, and is common to all the three pair of bellows: it conſiſts of a large flat board, joined by folded leathers on all ſides to the floor board, forming a large chamber for the reception of the air from the different bellows. The weight of this board, always reſting upon the included air, cauſes a preſſure of air, and affords a regular and equable ſupply to the pipes during any momentary intermiſſion of the action of the bellows; nor can the preſſure on the air ever exceed what is produced by the weight of the upper board, for if more air is thrown into it than paſſes off to the pipes, the top board riſes; but when it gets to the height which is intended, a ſtring, faſtened to the top board, raiſes up a valve in the floor board, and ſuffers the air to eſcape, by returning into the bellows below. By this means the reſervoir can never be in danger of burſting. A ſtring is faſtened to the top board of the reſervoir, and paſſes over a ſmall pulley *y*, (*fig.* 1.) fixed on the end of a light ſpindle which comes through the front of the inſtrument over the keys, and has a hand or index at *y*, pointing to marks upon a ſmall dial plate, indicating the height to which the top has riſen, and, conſequently, the quantity of air in the reſervoir, ſo that this index ſerves as a guide to the performer, to blow as much as is neceſſary to keep the reſervoir full, but no more.

The wind cheſt, F, is now to be deſcribed: this is a ſhallow box, as the ſection ſhews, the whole ſize of the inſtrument, and ſuſpended in the frame: the air is conveyed from the bellows up to it by the wind trunk E E, at the end of the inſtrument: the wind cheſt contains a number of valves *k*, which at times permit the exit of the air; they are made of ſlips of leather with three pieces of wood glued to them, and are kept ſhut by a ſmall wire ſpring *w*, (*fig.* 1.) applied to each. The valves are opened by means of ſmall wires, *b*, coming down from them, through the bottom of the wind cheſt, and connected, as before mentioned, with the levers N. When any one is opened, the air paſſes out of the wind cheſt into a horizontal groove, which is ſeen juſt over the valves marked *i*, *k*, (*fig.* 1.) and aſcends through vertical paſſages into any of the pipes G, H, I, K, L, M, cauſing them to ſound: the wires, *b*, are hooked to the valves at their upper ends, and at the lower are jointed to the levers N: theſe have their centres fixed in the rail R, which extends along the whole inſtrument. At the oppoſite end of theſe, ſmall rods, Q, are jointed, which at the lower ends reſt upon the extreme ends, O, of the finger-keys O, P. By this arrangement, when the end, P, of any key is preſſed down, it raiſes the rod Q: this, by the lever N, draws down the wire *l*, thus opening the valve *k*, and by admitting air, cauſes the pipe or pipes belonging to that key to emit a ſound.

It has been before mentioned, that each key has ſeveral pipes of different tones, but tuned to the ſame note. In the inſtrument before us, there are ten pipes to each key, ſo that there are ten ſyſtems of pipes; but as only a part of theſe is ever required to be ſounded together, the ſtops or ſliders are provided to ſhut off or open the paſſages from each valve to as many pipes as the piece of muſic requires. The ſtops are ſituated at *e*, *f*, and *g*, in the boards placed over the wind cheſt; they are narrow rulers of mahogany (ſeen lengthwiſe in *fig.* 2.) ſliding in paſſages, which they exactly fill, and through which all the vertical paſſages to the pipes are conducted. The ſtops have holes through them anſwering to theſe paſſages, and when theſe holes are over the paſſages, they are open to allow the air to paſs through, but by drawing the ſlider endways a ſmall diſtance, the ſpaces between the holes in the ſtop apply themſelves over the paſſages, and ſhut them all up at once. Each ſtop or ſlider opens paſſages to a ſet of pipes, conſiſting of one pipe anſwering to each of the notes of the finger-keys: theſe pipes are gradually diminiſhed in length and ſize, from the largeſt baſs note to the ſmalleſt treble, as is ſhewn in the figures at G, H, I, K, L, M, in different rows, ſome of which contain only about half the number of pipes correſponding with the finger-keys, the remaining numbers being placed in other rows for want of room, and the upper board *e e*, called the ſound board, on which the pipes are placed, has horizontal paſſages cut in it, to conduct the air from each valve to its reſpective pipe, when the ſame is not ſituated exactly over it, as indeed very few are; for the number of pipes is ſo great, as to occupy all the ſpace on the ſound board, they muſt therefore be placed as the room will admit.

In the ſame manner, it will be obſerved in *fig.* 2, that the finger-keys O, O, are placed cloſe together in a ſmall ſpace, while the wires *l*, *l*, and the valves *k*, occupy the whole length of the inſtrument. To manage this, the levers, N, are not placed parallel, but diverging from each other, ſo that the ends, Q, are cloſe together, but the oppoſite ends are a conſiderable diſtance aſunder, and therefore come immediately beneath the valves: the wires are connected with theſe levers by nuts ſcrewed upon them, and this admits of adjuſting them, that the valves ſhall all be ſhut cloſe by their ſprings, when the finger-keys are all in a line, and at their higheſt poſition ready to be preſſed down.

It is ſeen in *fig.* 1, that each of the horizontal paſſages or grooves immediately above the valves *k*, have ten other paſſages riſing up from it, and in theſe, as before-mentioned, the ſtops are ſituated. There are three ſets of theſe ſtops, marked *e*, *f*, *g*, one above the other; but by drawing any of the three the ſame effect will be produced on the inſtrument, *viz.* ſhutting off or opening the row of pipes to which they belong. The three ſets of ſliders are for three different purpoſes; thus the loweſt ſet is moved by handles, or drawers coming out in front of the inſtrument, cloſe to the finger-keys, and they are drawn out to open the ſtops by hand; the middle ſet of ſliders is moved by the foot of the performer; the upper ſet is actuated by the barrel, when the organ is uſed in that manner. The organ pipes are of two kinds, of metal and of wood; the wooden ones are a ſquare trunk of deal wood A B, (*fig.* 3.) cloſed at one end by a moveable plug of wood D, and at the other by a piece of wood E, containing a crooked paſſage to bring air to the pipe, through the ſhort tube F; *a* is a piece of oak board glued to the block E, called the cap, and hollowed out, to communicate with the crooked paſſage, through the block, leaving a ſmall and very narrow crevice between the end of it and the edge of the block E, through which the air iſſues in one continued current; in its paſſage it is divided by the edge of one ſide, B, of the trunk, which is cut as ſharp as poſſible for that purpoſe, and which is exactly in the ſame line with the orifice whence the air is emitted. The ſound is produced by the vibration of the air which is contained in the trunk A B, and by increaſing or diminiſhing the length of this trunk the tone is

altered

altered at pleaſure, to bring it to the proper note it is to perform when placed in the inſtrument. This alteration of the length is made by ſliding the plug, D, up or down in the pipe.

A ſection of a metal pipe is ſhewn in *fig.* 4; it is nearly the ſame in operation as the wood pipe, though different in its conſtruction. It is a cylindric tube, A B, formed of a mixture of lead and tin, caſt in thin ſheets and ſoldered up; it is open at one end and nearly cloſed at the other by a partition, E, of the ſame metal, called the languid, which is circular for about two-thirds round, and ſoldered into the end of the pipe; the other third is a ſtraight edge, and made rather ſharp on the angle. F is a conical pipe conveying the air to the pipe: the upper end of this conical pipe is bent to be parallel to the edge of the languid E, and thus forms a ſmall cleft, ſimilar to the mouth of the wooden pipe for the paſſage of the air. The lower end, B, of the cylindrical pipe is bent into the line of the cleft, to divide the current of air. The metal pipes are open at top, and are brought to tune by enlarging or diminiſhing the pipe at the top, and thus altering its bulk; *a* is a piece of metal, called the ear, ſoldered upon the pipe at each end of the cleft, to prevent the ſtream of air being diſperſed ſideways, before it meets the edge or upper lip of the pipe. In the ſmall pipes this is not applied, and in the wood pipes its place is ſupplied by the edge of the wood board forming the ſide of the pipe, which is not cut away.

There is another kind of organ pipes, which have a reed in the mouth; they are called trumpet ſtops. One of theſe is repreſented in ſection at *fig.* 5. Here A is a cylindrical tube, bringing the air up from the wind cheſt, and on the top of it a leaden ring or ſocket, B, is fitted. This is the ſupport of the conical pipe, D, where the ſound is produced. The air paſſes into the tube D, through a braſs tube or reed *a*, which is ſtopped at the lower end, but has an opening down the front, where it is made flat. It is furniſhed with a tongue, or ſlender braſs ſpring *b*, which applies to this flat ſide and covers the opening. When the wind is impelled into the pipe A, it enters through the reed, and puts the tongue into a vibratory motion, which gives the peculiar tone of this pipe. The tongue is held in its place, againſt the reed, by a ſmall wedge thruſt in by the ſide of it, and a wire ſpring *d d*, which preſſes the tongue againſt the reed, determines the length of the tongue, which ſhall have liberty of free vibration; conſequently, by ſliding this wire up or down, the pipe is brought to tune.

The trumpet ſtop is the moſt powerful in the inſtrument, and improves the tone as much as it increaſes the peal of the chorus. Being tuned in uniſon with the diapaſons, it ſtrengthens the foundation, and ſubdues the diſſonances of the thirds and fifths of the ſeſquialtera, imparting to the compound a richneſs and grandeur of effect, adequate to the ſublimeſt ſubjects.

The names of the ſtops or ſyſtems of pipes uſed in this organ are as follows:

*Twelfth*, a metallic ſtop, ſo denominated from its being tuned twelve notes above the open diapaſon, which will be mentioned hereafter. This ſtop, on account of its pitch or tuning, can never properly be uſed alone. The open diapaſon, ſtop diapaſon, principal, and fifteenth, are the beſt qualified to accommodate it to the ear.

*Stop diapaſon*, a ſtop, the pipes of which are generally made of wood, and its baſe, up to middle C, always of wood. They are only half as long as thoſe of the open diapaſon, and are ſtopped at the upper end with wooden ſtoppers or plugs, which render the tone more ſoft and mellow than that of the open diapaſon. As the pipes of this ſtop are of large ſize, they cannot be contained in one row on the ſound board, they are therefore diſpoſed in two rows, and have two ſliders, one for the baſs the other for the treble.

*Open diapaſon*, a metallic ſtop, which commands the whole ſcale of the organ, and which is ſo called in contradiſtinction to the ſtop diapaſon, the pipes of which are cloſed at the top; this has alſo two ſliders for baſs and treble.

*Principal*, a metallic ſtop, originally diſtinguiſhed by that name, becauſe holding, in point of pitch, the middle ſtation between the diapaſon and fifteenth. It forms the ſtandard for turning the other ſtops. It has two ſliders.

*Dulciana*, a ſtop generally uſed in the choir organ. It poſſeſſes a peculiar ſweetneſs of tone, which it chiefly derives from the bodies of its pipes, being longer and ſmaller than thoſe of other ſtops. It is tuned in uniſon with the diapaſon, and equals them in compaſs upward.

*Fifteenth*, a ſtop which derives its name from its pitch or ſcale, being fifteen notes higher than that of the diapaſon. This ſtop and the twelfth, mellowed and embodied by the two diapaſons and principal, form a proper compound for accompanying choral parts in common choirs and parochial churches. It is divided into two rows on the ſound board for baſs and treble.

The ſliders which bring theſe different ſtops into action are moved by the following means: the lower ſet, Q, is drawn by levers at the ends of the inſtrument, which are formed on the upper ends of upright ſpindles *o*, *o*, (*fig.* 2.) turning on pivots ſupported by the frame: to the lower ends of theſe, long levers *p*, (*fig.* 2.) are fixed; and at the end of theſe, ſmall rods are jointed, which come through the front of the caſe of the inſtrument, cloſe to the finger-keys, and have ſmall ivory knobs fixed upon them. Theſe are marked with the names of the ſtops of pipes to which they belong, and any one being thruſt in moves its ſlider, and opens the ſtops of pipes, which will then be ſounded by preſſing the finger-keys. There are ten of theſe handles, *viz.* five on each ſide of the finger-keys, though only two on each ſide are ſhewn in the figure, to avoid confuſion: there being ten handles one is given to each of the ſliders in the lower ſet, as ſhewn in *fig.* 1, and their names and properties have before been mentioned. The middle ſet of ſliders, *f*, is drawn by bent levers, as ſhewn in *fig.* 2. at *r*: from the horizontal arm of this lever a wire proceeds to connect it with a pedal beneath the inſtrument, by which the ſlider is moved: theſe pedals are uſed in quick muſic, to change the pipes upon which the keys operate, by drawing another ſlider. There are only two of theſe pedals, but they operate upon all the ten ſliders: thus, the bent levers, *r*, are fixed upon horizontal axes, which carry ſeveral levers, to operate upon as many ſliders at once as are required. The pedals are for the left foot, one being longer than the other, ſo that the heel acts upon it, leaving the toes for the other: the firſt of theſe pedals ſhuts up the twelfth, both the fifteenths, and both the principals; the other pedal commands the remainder of the ſtops, except the dulciana. The finger-keys, O, P, are all together ſitted in a kind of frame or box, which ſlides in a groove: in *fig.* 1. they are repreſented as drawn out to the full extent, but admit of being thruſt back out of the way to make no projection in front of the inſtrument. When drawn out as far as they will come, the end, *o*, of each key comes immediately beneath the end of each of the rods Q, which are retained in their poſitions by paſſing through holes in a fixed rail extended acroſs the keys. The parts of the organ being now ſo fully explained, it is needleſs to ſay much of their mode of action. The wind cheſt and reſervoirs are kept conſtantly full of air by the bellows, and

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in this ſtate any key being preſſed down admits the air to the pipes. The ſtops which the performer expects to want are opened firſt; but by the pedals, as before mentioned, he can bring on or take off any others during the performance. There is alſo another pedal which actuates the ſwell; this is a number of valves or boards, fitted in the manner of Venetian blinds, and ſituated at 38, 38, (*fig.* 1.) forming the front of the cloſe caſe or cheſt which encloſes the pipes. Theſe valves, being gradually opened by the preſſure of the foot, give the power of increaſing the ſound, as the wind does the ſound of a peal of bells, or ſuppreſſing it in like manner, by cloſing them up. The ſwell is ſituated immediately behind the ornamental front of the inſtrument, which is in part only thin ſilk, ſtretched in a frame to admit the paſſage of the ſound. Each of the boards turns on pivots at its ends, and having ſhort levers, which are connected together by a rod 39, they all open or ſhut together. At the lower end of the rod is a ſpring to ſhut them cloſe, and they are opened by a lever 40 within-ſide, from which a wire deſcends to the treadle before-mentioned. The ſwell produced a moſt delightful effect in ſome muſic, giving the piano and forte to the organ, in a greater perfection than any other inſtrument admits of, not even excepting the violin.

The mechaniſm of the barrel comes now to be deſcribed, for we have hitherto ſpoken only of the finger-key. The ſection (*fig.* 1.) ſhews that there are two rows of valves in the wind cheſt. The uſe of the firſt ſet at *k* has been fully explained as belonging to the finger-keys; the ſecond ſet, marked *i*, are opened by the keys, *h*, of the barrel S; they admit the air from the wind cheſt into the ſame paſſages as the other valves, and therefore ſound the ſame pipes when opened: the valves are, like the others, cloſed by ſmall ſprings, and have wires, *m*, coming down through the bottom of the wind cheſt, and united to the ſhort keys *h*. Theſe and the other parts are more particularly explained by the enlarged view of the barrel at *figs.* 6, 7, and 8. of *Plate* IV., where it is ſhewn detached from the organ, with all its mechaniſm in perſpective; but as the parts would intercept each other, if placed in their proper ſituations, *figs.* 7 and 8 are repreſented as removed from the end of the barrel, though in reality theſe parts all come cloſe to the end of it. This is explained by *figs.* 10 and 11, the former being an end view of the barrel and all its parts, and *fig.* 11. an elevation in front ſhewing its whole length.

The keys, *h*, are in miniature, the ſame as the levers at N, (*fig.* 1.), but their oppoſite ends are operated upon by pins projecting from the circumference of the barrel S, having beaks, as the figures ſhew, upon which the pins operate in paſſing beneath them, to lift up the points of the keys: the pins in the barrel are ſo diſpoſed as to lift the keys in the ſame order and time, as any piece of muſic for which the barrel has been previouſly made. The keys all turn upon one wire as a centre of motion, which is ſupported by a wooden rail T, extended acroſs the inſtrument. To prevent the keys ſhifting ſideways, and by that means miſſing the pins in the barrel intended for them, they move in ſmall notches cut by a ſaw in a piece of braſs plate, which is ſcrewed to the front edge of the piece of wood T, and projecting beneath it: the wire, which forms the centre for the keys, is alſo fixed to the piece of wood T, which is called the key frame; it is ſupported at its ends on centre points, on which it riſes and falls as a centre of motion, to lift the points of the keys clear above the pins of the barrel. Theſe centre points are made in plates of braſs at *n*, ſcrewed to the ends of the frame, and projecting ſo as to bring the centre of motion to coincide with the joints at the ends of the keys *h*, with the wires, *m*, proceeding to the valves *i*, (*fig.* 1.) Theſe braſs plates carry projecting arms 1, which have ſcrews tapped through the extremities, and the points of theſe coming in contact with fixed ſtuds projecting from the frame, form reſts for the key frame; but by turning theſe ſcrews the diſtance of the points of the keys from the barrel can be regulated at pleaſure, that the keys may be properly lifted by the pins of the barrel.

The barrel is put in motion by a handle *w*, applied to the ſpindle *w*, (*fig.* 1.) before-mentioned, and ſhewn in *Pl.* II. at *fig.* 6: this has an endleſs ſcrew, 2, formed upon it, which acts in the teeth of a ſmall wheel, which is fixed on an axis, 3, parallel to the barrel, and proceeding towards its end, where it carries a broad pinion, 4, engaging the teeth of a large wheel, 5, fixed on the extremity of the barrel. By this means the ſame movement which, as before mentioned, blows the bellows, by the crank *x*, (*fig.* 1.) cauſes the barrel to revolve ſlowly. The manner in which the barrel is made to play a variety of different tunes in ſucceſſion is thus: the ſpaces between the keys *h*, as ſhewn in *figs.* 6 and 11. are ſufficiently wide to have eight rows of pins diſpoſed in them, therefore only one-eighth of the circles of pins are at once engaged with the keys, and by moving the barrel lengthways a ſmall quantity, an entire new ſyſtem of pins are preſented to the keys, and theſe are arranged to produce a different tune.

The barrel is ſupported on a frame of wood, which is repreſented detached in *fig.* 6; its poſition in *figs.* 1 and 2 is denoted by *s*; it ſlides in grooves, ſo as to be capable of being drawn out, for the purpoſe of changing the barrel, and putting in a different one, but when ſlid back to its proper poſition is retained by two bolts. The pivots of the barrel reſt in frames, 6, of braſs at each end, which are attached to the woodwork by centres, on which they move ſideways. A lever, 7, (*fig.* 6.) proceeds from each frame, and theſe are united by a wooden rail behind the barrel, which therefore cauſes the two frames to have the ſame movement on their centre, and carry the barrel forwards in the line of its axis, when at liberty. When in uſe it is confined by pieces of iron, 8, 9, moving horizontally on hinges fixed to the frame work, and preſſing on the ends of the pivots of the barrel. The piece 9 is preſſed by a ſpring behind it; the other piece, 8, at the oppoſite end of the barrel, is ſupported againſt the circumference of a wheel 10, (*fig.* 7.) which is formed like a ſnail, by continual variations of its radius. On the ſame ſpindle with this ſnail-wheel is another wheel, 11, divided on its edge with eight large notches, into which a roller at the extremity of a detent, 12, adapts itſelf: the detent being puſhed down by a ſtiff ſpring, always obliges the wheel, 11, to reſt in one of the eight poſitions correſponding to the eight notches for the roller, and every one of theſe poſitions produces a change in the ſituation of the barrel, becauſe of the different radii of the ſnail 10, which permits the piece of iron, 8, to move; the ſpring piece, 9, at the oppoſite end always keeping the end of the barrel pivot in cloſe contact with it: therefore, by turning the wheel, 11, round, the barrel is ſhifted a ſmall quantity every time a different notch of the wheel, 11, comes to reſt beneath the roller 12, and thus all its different tunes are played in ſucceſſion. The wheel, 11, is turned about by means of eight pins projecting from its ſurface, one anſwering to each notch; theſe are preſſed down by a catch 13, joined to a ſhort lever 14, projecting from an axis *q*, which alſo carries two other levers, marked 15 and 16; the former of theſe has at the upper end a wire, 15, coming through the frame of the organ, and furniſhed with a knob, by pulling which the lever, 14, is depreſſed, and the catch, 13, turning the wheel, 11, round one notch, ſhifts the tune of the barrel, as before explained. But without ſome contrivance to raiſe up the key-frame, T, when the barrel is ſhifted, its pins might catch ſome of the points of the keys, and break or

bend

bend them ſideways. To avoid this danger, the ſame lever, 15, which communicates motion to the wheel to ſhift the barrel, has a detent, 17, jointed to it at one end; it paſſes through the frame of the organ reſting upon a roller 18; the extremity of it is ſituated beneath a ſmall roller 19, which is attached to the front plate of the key-frame at its end: the operation of this is, that when the knob, 15, is drawn forwards to ſhift the barrel, the detent, 17, alſo advances, and an inclined or thicker part coming upon the roller 18, cauſes the end, 19, to riſe up, and lift the key frame T, (*fig.* 8.) ſo high, that the pins in the barrel will clear the keys before the barrel has began to move endways, by the ſhifting of the ſnail-wheel 10. The ſhift having been made, the knob, 15, is let go, and the return of the levers to their firſt poſition, by ſprings on purpoſe, permits the key-frame to deſcend, and all is ready for the next tune, which commences as ſoon as the barrel is turned round. To prevent the key-frame deſcending with a jerk, which might do it injury, a ſmall lever, 20, (*fig.* 8.) projects from it at one end, and has a wire proceeding upwards to a ſmall pair of bellows, 21, fixed up beneath the wind cheſt; they have no opening into them, except a hole through the top board, which is covered by a valve, ſhutting downwards, to permit the eſcape, but prevent the re-entrance of the air. The operation of this is, that when the key-frame is lifted up for the purpoſe of ſhifting the barrel, the bellows cloſe, and the air included in them paſſes out beneath the upper valve; but on the frame being ſuffered to deſcend, the air cannot ſpeedily obtain admiſſion into the bellows, as there is no other paſſage than from leakage, and this regulates its fall. Beſides theſe proviſions for ſhifting the barrel, the pinion, 4, (*fig.* 8.) is likewiſe detached from the wheel at the moment of its ſhifting, that it may have no impediment to its motion from friction. To explain this, we muſt obſerve that the pivot of the ſpindle, 3, is ſupported by a crooked lever, 22, (*fig.* 10.) moving on a fulcrum in the framing; the oppoſite end being preſſed down by a ſpring 23, fixed on the top of the frame *s*, always keeps the teeth of the pinion, 4, and wheel, 5, in cloſe contact with each other. The lever 1, attached to the key-frame, has a rod, 24, deſcending from it to connect with a ſecond lever, 25: this carries a rod, which is forked at the lower end, and embraces the pivot of the ſpindle 4. By this means, when the key-frame is lifted up, as before deſcribed, the lever, 1, is depreſſed, which, by the rod 25, forces down the end of the ſpindle 4, and diſengages the pinion from the barrel; but the moment the key-frame deſcends, the ſpring 23, at the end of the lever 22, preſſes up the wheels into gear with each other. That the ſhifting of the tune may be done by a pedal for the foot, as well as by pulling the knob 15, there is a rod deſcending from the end of the lever, 16, to the bottom of the inſtrument, where it is connected with a pedal; therefore, by depreſſing this, the ſame effect is produced as would be by drawing out the knob 15.

A great improvement in this organ is the circumſtance of the barrel being made to operate upon the ſtops, as well as the keys, by which means it performs any full piece of muſic with the fineſt effect. The mechaniſm by which the motion is given to the ſtops is very ingenious, and requires particular figures for its deſcription. The upper ſet of ſliders *e*, (*figs.* 1 and 2. *Pl.* I.) are appropriated ſolely for the barrel; they are moved at the left-hand end (*fig.* 2.) by being attached to vertical levers W; the lower ends of theſe are connected by light wooden rods, X, X, extending beneath the wind cheſt, to ſmall levers *t*, (*fig.* 1.); theſe are affixed to ſhort ſpindles, whoſe ſituation is marked by *v*, in *fig.* 1. Now it is evident, by that partially turning the ſpindle *v*, the lever, *t*, will draw the connecting rod X, and by the lever, W, actuate the ſlider, *e e*, of the ſtop. The figure alſo ſhews that the extremities of the ſpindles, *v*, are immediately over the extremities of the keys *h*. It is in the connection between theſe that the ingenious contrivance is ſhewn. *Fig.* 9 is a ſmall detent or three-armed lever, in ſhape of the letter T, called the tumbler, fixed on the projecting extremity of the ſpindle *v*; from each of its two arms, 26, 27, a pin projects: 28, (*figs.* 12 and 13.) is a detent of braſs, connected at its lower end with the end of one of the keys *h*, (*fig.* 6,) and therefore deſcends when the oppoſite extremity of the key is lifted up by the pins of the barrel. This detent has two hooks at its upper end, which can be occaſionally brought to engage either of the two pins projecting from the two arms, 26 and 27, of the tumbler; but as theſe two are on oppoſite ſides of the centre of motion *v*, it is evident that, by being hooked on one, it will, when depreſſed by the key, turn the ſpindle, *v*, one way, and ſhut the ſtop, but being hooked on the other pin, the ſame motion of the key will produce an oppoſite effect on the ſpindle, and open the ſtop. The detent is made to ſhift itſelf every time it is acted upon in this manner: the upright arm, 29, of the tumbler has a projecting claw, which is cleft for the reception of a light ſpring, 30, affixed to the lower part of the detent 28, and when at liberty ſtanding ſtraight in the direction of its length. Now ſuppoſe the parts in the poſition of *fig.* 13, the hook of the detent is over the pin, 27, of the tumbler: in this ſtate, if the detent is drawn down by the key, it depreſſes the arm 27, and throws the arm, 29, over to the oppoſite ſide, as ſhewn in *fig.* 12, carrying the end of the ſpring, 30, with it, and bending it. Now the inſtant the preſſure of the key is relieved, the ſpring throws the detent over to the other arm, 26, of the tumbler, and it is ready the next time it is acted upon by the key, to return the ſtop to its original poſition.

As it is neceſſary, when the barrel commences a piece of muſic, that the whole number of ſtops ſhould be open, the lever 40 (*figs.* 8 and 10.), is fixed on the ſpindle *q q*, and has a rod, extending beneath the inſtrument to the right-hand end: there it operates upon a lever, ſituated on a horizontal ſpindle, carrying as many arms as there are ſtops. Theſe, when the barrel is ſhifted by the knob 15, as before explained, puſh in the whole of the ſtops at once.

There are four ſtops or ranges of pipes, which are excluſively appropriated to the barrel, in addition to the ten ſtops which belong to the finger-keys. Theſe are called the ſtop-diapaſon accompaniment, which are wooden pipes to be uſed in concert with the ſtop diapaſon; the flute ſtop, which conſiſts of ſmall wooden pipes; as are alſo the pipes of the flageolet ſtop; laſtly, the trumpet ſtop, which conſiſts of metal pipes with reeds, conſtructed as ſhewn at *fig.* 5.

Our readers will now have a good idea of the mode of action of the barrel. The key-frame, as ſhewn in *fig.* 6, contains 102 keys; 88 of them being connected with the valves in the wind cheſt, and the remaining 14 for the ſtops: theſe are all ſituated towards the left-hand end, becauſe, as ſhewn in *fig.* 2, the wires for the valves are there at ſo great a diſtance aſunder, as to admit the ſtop-keys to be placed in the ſpaces between the valve-keys. The barrel has 102 circles of pins in action at the ſame time, and eight times as many, *viz.* 816, upon its circumference, containing eight different tunes, as before deſcribed; any one of which can be played by ſhifting the ſnail-wheel 10. There is a ſmall dial in front of the organ, with an index, which ſhews what tune the barrel is ſet for: it is on the oppoſite ſide to the wind-dial *y* (*fig.* 1.), and its motion is communicated from the wheel 11, by a lever and detent. On turning the handle *w*, the endleſs ſcrew, 2, gives motion to the ſpindle 4, and that turns the barrel with a very regular motion, becauſe of the fly-wheel *x* (*fig.* 1.)

As

As the pins in the barrel pafs by the keys, they lift them up at the proper intervals of the tune; and many are made like ftaples, with a long fhank, fo as to hold a note, by keeping up the key for fome time. All this time the ftops are, by the tumblers (*figs.* 12 and 13.), as before mentioned, brought on and off to give all the variations, in a full piece of mufic, and introduce the different inftruments which are imitated by the pipes of the feveral ftops, giving the inftrument the effect of a whole band of performers, and that with a precifion of time and harmony feldom to be met with in a concert. The formation of thefe barrels (for the inftrument has feveral different ones which can be put in) is a moft delicate mechanical operation, and requires a good knowledge of mufic. Meffrs. Flight have improved this branch of the art, by the introduction of mechanifm for actuating the ftops, and alfo by fome mechanical contrivances, for dividing and fetting out the barrels more accurately than they are ufually done.

It will be evident that, on a barrel fuch as we have defcribed, no piece of mufic of great length can be performed; becaufe when the barrel has made its revolution, the fame tune is repeated. But to give the inftrument the power of performing very long pieces, fpiral barrels are introduced: in thefe, the pins, inftead of being arranged in 816 circles, are difpofed in 102 fpiral lines, each making eight turns upon the barrel, which, as it revolves on its axis, alfo traverfes end-ways, thus bringing the fpiral lines conftantly beneath the keys; fo that the barrel admits of making eight revolutions, before it repeats the fame tune. It is evident that fuch a barrel cannot be fhifted to produce different tunes, as in the former cafe, its circumference being wholly occupied by one piece, if it is very long; or it may be made to contain two, three, or four fhorter pieces: but ftill they muft follow in fucceffion upon the fame fpiral lines, and will come after each other, in turning the barrel, without any fhifting. When a fpiral barrel is put into the inftrument, the fnail-wheel, 10, is detached from its fpindle, as it can be of no ufe: inftead of it, the arbor or pivot of the barrel has a fcrew or worm 34, (*fig.* 14.), fixed upon it; the interval of its threads correfponding in diftance with the fpiral lines upon the barrel; fo that a fixed piece of fteel, being held in the groove of the fcrew, will, when the barrel is turned round, caufe it to traverfe at the fame time it revolves. This fixed piece of fteel is attached to a projection of a piece of brafs, 31, 32, 33, called the thumb-piece: it fupports the fpindle of the fnail-wheels, 10 and 11, before defcribed; but having no motion in the ufe of the plain barrel, was then confidered as a fixed piece; it is in reality attached to the key-frame thus: it has an arm 32, (*fig* 7.) proceeding from it, which at the extremities turn up into joints, 32, 32; thefe are received into fimilar joint pieces of brafs, fcrewed to the key-frame T, fo fituated that the joints are exactly in the line of the centre of motion for the key-frame, fo that the thumb-piece has liberty to rife and fall on the fame centre of motion as the key-frame; but being attached to it by a long firm axis, 32, 32, it has no other motion than upon this centre. A wire 37, (*fig.* 7.) is jointed to the thumb-piece 31, and, paffing through a hole in the key-frame, has a nut fcrewed upon it: this is fo adjufted, that the key-frame may be lifted up a fmall quantity, without raifing the thumb-piece; but after this, the nut lifts it up. By this means the key-frame will always be lifted up, to clear the points of the keys from the pins, before the edge, 33, quits the groove of the fcrew, and fuffers the barrel to fhift end-ways

Suppofe the barrel put into its place, and thruft towards the left hand, as far as it will go, the edge, 33, of the thumb-piece is inferted into the groove of the fcrew, as fhewn in *fig.* 14; the key-frame let down, and all is ready to begin, from the commencement of the piece of mufic. On turning the handle, the barrel revolves, and at the fame time traverfes, by the fcrew 34, till it has made eight turns, and come to the end of the piece; the end of the fcrew, 34, having come to the edge of the thumb-piece 33, the barrel muft be returned to its firft pofition, to repeat the mufic. It does this itfelf by the following means: a projecting pin, 35, is fixed in the right-hand end of the barrel, at fuch a diftance from the centre, that it will intercept the end of a catch, 36, fixed to the key-frame; but it paffes clear, by the fide of this catch, at every revolution but the laft, when the fcrew has traverfed the barrel fo far as to bring the pin, 35, into the plane of the catch 36. This happens at the moment the piece is finifhed; and as the barrel turns, it lifts up the key-frame, and raifes the keys clear, ready for the barrel to return: the pinion, 4, is at the fame time difengaged by the levers, 24, 25, as before defcribed. The keys having rifen fufficiently for this purpofe, the wire, 37, lifts up the thumb-piece, fo that its edge, 33, leaves the fpiral groove of the fcrew, and nothing now prevents the return of the barrel by the action of the fpring-piece 9, which always preffes on the left-hand pivot. But as the key-frame would defcend the inftant the pin 35, in the end of the barrel, quits the catch 36, another catch, 38, at the other end, is introduced: this holds up the key-frame until the barrel has completed its return. The end of it then ftrikes the lower end of the catch: this fuffers the key-frame to defcend, and the edge, 33, of the thumb-piece enters the groove of the fpiral at its commencement, ready to repeat the tune: the catch, 38, has a fcrew through the lower end, upon the head of which the barrel ftrikes; this admits of adjuftment, fo that the edge, 33, fhall fall, when the groove of the fcrew is precifely beneath it.

We have been thus particular in our defcription of this fuperb inftrument, not lefs on account of its mechanical ingenuity, than from the great celebrity it has obtained from the firft profeffors of mufic, who have frequently borne teftimony to its evident fuperiority over any thing of the kind before produced; and allowed that mechanifm has, in this inftance, become a moft powerful rival of the beft execution on finger-keys.

His royal highnefs the prince regent lately dined with lord Kirkwall, and a felect party of nobility. During the defert they were entertained by the performance of the celebrated opera of Mozart's, the Zauberflute, by the barrel part of this inftrument, followed by the march, in the fame piece. The machine produces the various accompaniments of a whole band of mufic, in fuch dulcet as well as forcible tones, that no one would credit without an opportunity of hearing it.

The inventor then played various pieces on the finger-keys, one peculiarly adapted to difplay the rich, mellow founds of the bugle horn; then produced a fimilar imitation of French horns and baffoons, with echoes to each, which were exactly as if they replied from the oppofite fide of a river to the original notes founded in the room. Thefe magic effects are chiefly produced by the fwel, which gives to the organ all the variation of foftnefs or loudnefs, imitating at pleafure the founds of violins, or bowed inftruments, in the moft ftriking manner, but rather by affociation than reality, becaufe thofe are the inftruments from which we are accuftomed to hear the alternation from foft to powerful tones, in the greateft perfection.

The organs of which we have been fpeaking, however fimple or complex as to their number of ftops, or ranges of keys,

keys, &c. have but twelve finger-keys in each octave, and theſe are generally tuned to what is called the *mean-tone* ſyſtem, that is, eight of the major thirds, *viz.* on C, G, D, A, E; F, ♭ B, and ♭ E, are made perfectly in tune, or very nearly ſo, and four of the thirds, *viz.* upon B, ♯ F, ♯ C, and ♯ G, remain each, unavoidably, too ſharp, by an enharmonic dieſis (or near it), which ſome call a quarter of a tone, and conſequently, ſuch thirds *beat* very faſt. The organ in the Temple church, London, has fourteen ſounds, and as many finger-keys in each of its octaves; the performer has it therefore in his power to avoid or remedy the firſt of the above falſe thirds, by ſubſtituting ♯ D, inſtead of ♭ E, and the laſt of theſe (below C), in ſome caſes, by the uſe of ♭ A inſtead of ♯ G. Theſe ſubſtitutions the Temple organiſt is enabled to make during performance, owing to the ſhort key between D and E being divided in its length, the longer or front half of it touching ♯ D, and the ſhorter or back half ſounding ♭ E. In like manner the ſhort key between G and A is divided, the front part for ♯ G, and the back part for ♭ A. This is, we believe, the largeſt number of finger-keys which remains in uſe in this, or perhaps any other country, although inſtruments have been made, and tried, with nineteen finger-keys in each octave, but playing upon them was found too difficult, if not impracticable. The Foundling Hoſpital organ, in London, has ſixteen ſounds in each of its octaves, but only twelve finger-keys, as uſual, having quarter notes, as ſome call them, for ♯ D, ♭ A, ♯ A, and ♭ D, in addition to the twelve common notes as above; and which new notes, by means of two ſtops that move ſideways, can be brought on when wanted, in order to correct all the four major thirds that are too ſharp, as above mentioned: ſtill, however, ſeveral other falſe concords occur in the uſe of this inſtrument.

The organ at Chriſtchurch, in Blackfriars road, London, has been lately erected under Mr. Hawke's patent, a copy of which will be found in the Philoſophical Magazine, vol. xxxvii. p. 323 and 325, ſee alſo vol. xxxix. p. 417. This has ſeventeen ſounds in each octave, (ſee our article HAWKE'S *Temperament*,) yet has only the twelve uſual finger-keys, ſeven of which are long ones, and five ſhort ones; the latter producing the *ſharp* notes, unleſs that a pedal is preſſed, which flattens each of theſe notes a dieſis, and makes them all *flat* notes.

The organ which Dr. Kemp exhibited in his lectures at the Ruſſel Inſtitution, for which Mr. Loeſchman has a patent (ſee the Philoſophical Magazine, vol. xxxvii. p. 326, and vol. xxxviii. p. 47.) has twenty-four ſounds, and as many pipes in each octave. By the help of ſix pedals, and the twelve uſual finger-keys, the performer is enabled to execute the mean-tone ſyſtem correctly, or any other, in the twenty-four uſual keys, and very nearly ſo for all the concords that occur in thirty-three different keys.

All theſe progreſſive ſteps in the improvement of the *tune* of organs, are only applicable to the tempered ſyſtems of tuning, in which the greater part of the concords muſt ſtill be left imperfect, although the moſt improved ſyſtems have them ſo in *ſmall*, and in equal degrees, inſtead of that great and diſagreeable irregularity, which attends all the uſual modes of tuning organs with only twelve notes; we ſay uſual modes, becauſe on the organ, an *equal temperament* has certainly never been uſed, whatever may have been done on piano-fortes, and other ſtringed inſtruments, where *beats* are leſs obſervable and offenſive. In the year 1810, the Rev. Henry Liſton perfected an inſtrument, calculated to ſuperſede temperament altogether, and took out a patent for the ſame, under the name of the Euharmonic organ; which patent will be found deſcribed in the Philoſophical Magazine, vol. xxxvii. p. 328.) Since that period, Meſſrs. Flight and Robſon have completed another organ for him (Philoſophical Magazine, vol. xxxix. p. 373 and 414.), containing twenty-four pipes in each octave, and provided with eleven pedals, ſix of which, for flats and ſharps, are uſed exactly ſimilar to thoſe of Mr. Loeſchman above mentioned. This invention enables the performer to produce *perfect harmony* in every key which is in common uſe, as Mr. Liſton has fully explained mathematically, and by reference to numberleſs experiments and examples on his organ, in his "Eſſay on perfect Intonation," a work to which we wiſh to call the notice of compoſers as well as performers, as developing many of the hitherto hidden myſteries of harmony. It may be proper to add, that the twenty-four pipes of Mr. Liſton's organ, are occaſionally made to yield twenty-four other notes, which are each one comma flatter than the pitch of the pipes, and alſo eleven other notes, which are each two commas flatter than certain of the pipes; making in all fifty-nine notes in each octave; all which degrees of ſound frequently come into uſe, in the keys now commonly uſed on the organ; and in all the correct performances of violiniſts, ſingers, &c. they have always been in uſe. Theſe changes of the ſounds of his pipes, Mr. Liſton effects by ſhaders, or flat plates of metal of two different ſizes, which by means of his pedals are made to ſtand over the tops of open pipes, or before the mouths of ſtopped pipes, at the due diſtance for flattening the pipe the exact proper quantity, while it is ſo preſented to the current of air iſſuing from the pipe. The tuning of theſe organs has no difficulties, except the labour of it, becauſe not a ſingle interval requires tempering, but the whole are produced from perfect concords, without the ſloweſt perceptible *beating*, ſuch intervals as a performer uſes in tuning his violin.

In attempting to deſcribe the requiſites of a good organ, we ſhall begin with the bellows; which, beſides being of a ſize fully adequate to ſupply the chorus, ſhould at all times give an equal weight of wind. This may be known, by holding down two notes of the diapaſon, or any other ſtop, when the bellows are nearly full, and obſerving whether they continue in the ſame relative ſtate of tune, until the bellows are nearly empty. If they do, the wind is equal; without which no organ can ever be in tune: alſo, when carefully blown, no difference ſhould be heard from the action of blowing. In like manner, a ſingle note of the diapaſon ſhould continue unaltered in its pitch, and ſmooth in its tone, while the other ſtops are added in ſucceſſion, until the whole chorus be drawn. This proves that the wind meets with no impediment in its courſe to the pipes; a requiſite of no leſs importance than the former.

The draw-ſtops ſhould move with ſufficient eaſe and ſmoothneſs; and ſhould ſtop ſo decidedly, as to leave no doubt of their being completely drawn, or ſhut.

The touch of the keys ſhould be free and elaſtic, and exactly the ſame preſſure ſhould be requiſite to put down every key throughout the ſcale. No better proof can be given of a good touch, than that a turned ſhake can be executed with equal facility in every part of the ſcale, except perhaps in the loweſt octave, where it is not to be expected or deſired. If all theſe things act without noiſe, the mechanical parts of the organ may be conſidered good, and in order.

The goodneſs of the pipes is not ſo eaſily deſcribed, becauſe much depends upon the quality of the tone, of which little idea can be given in words. A fine quality and great ſtrength can hardly be expected from the ſame pipe: it, therefore, depends ſomewhat on choice which to prefer; though it does not follow that all ſoft-toned pipes are of a fine quality. But be the quality what it may, it ſhould be uniform from the top to the bottom; a requiſite which cannot be too ſtrongly inſiſted on in all inſtruments, ſo as to

give the idea of all the notes coming from the ſame pipe or ſtring.

It is indiſpenſable to an organ, that it have a good ſtopped diapaſon, as that ſtop is the foundation of the organ, and is never ſhut, except when the dulciana or flute are uſed as ſolo ſtops. It is of great importance that it be ſufficiently full and bold in the baſe, particularly in thoſe chamber organs which have an open diapaſon; as that ſtop is ſeldom extended lower than G gamut. And in large church organs, where the open diapaſon goes through the ſcale, the lower notes are feeble, if not ſupported by the ſtopped diapaſon; and it may be obſerved, that no ſtop ſhould be loudeſt at the top. Of the open diapaſon, little more need be ſaid than that it ſhould be full, ſmooth, and articulate. In ſmall organs it is entirely diſpenſed with; and in thoſe which are larger, it is in the treble only, or more or leſs extended into the baſe, according to the ſize of the organ, or choice of the builder; and it may be proper to obſerve, it is better that the loweſt pipes ſhould not be ſo loud as to make the break very perceptible. In large church organs there are frequently two open diapaſons through, and nothing can be a greater recommendation to an organ than its having good diapaſons. What has been already ſaid, will apply to all other ſtops generally, when taken ſingly; but their relative ſtrength is of great importance to the goodneſs of the chorus. As a ſingle ſtop ſhould not be loudeſt at the top, ſo the chorus ſtops ſhould not predominate over the diapaſons; a fault very general in the old organs, ariſing from the bad taſte of the times in which they were made. The chorus ſhould be rich, brilliant, and articulate; and the twelfth and tierce, and their octaves, ſhould not be heard, except when liſtened for. The trumpet-ſtop, when good, adds greatly to the majeſty, as well as to the ſtrength of the chorus; and its octave, the clarion, increaſes its brilliancy.

The goodneſs of theſe, and all other reed ſtops, beſides the requiſites already mentioned, depends upon their ſpeaking readily and quickly; and being free from the naſal tone, ſuch as is produced by bad players on the clarionet, or hautboy. And it had been well if the trumpet had never been uſed as any other than a chorus-ſtop; for its uſe, as an imitation of a real trumpet, has given riſe to the introduction of a variety of imitation-ſtops; moſt of them a diſgrace to the noble inſtrument in which they are ſuffered to intrude; and its conſequence, a trifling and vitiated ſtyle of performance, equally diſgraceful to the taſte of this country, where only it is cultivated.

ORGAN, *Hydraulic*, denotes a muſical machine that plays by means of water inſtead of wind.

Of theſe there are ſeveral in Italy in the grottos of vineyards.

Cteſebes of Alexandria, who lived in the reign of Ptolemy Euergetes, is ſaid to have firſt invented organs that played by compreſſing the air with water, as is ſtill practiſed. Archimedes and Vitruvius have left us deſcriptions of the hydraulic organ. Felibein, de la Vie des Archit. See Hawkins's Hiſt of Muſic, vol. i. p. 190, &c. See HYDRAULICON.

In the cabinet of queen Chriſtina is a beautiful and large medallion of Valentinian, on the reverſe of which is ſeen one of theſe hydraulic organs; with two men, one on the right, the other on the left, ſeeming to pump the water which plays it, and to liſten to its ſound. It has only eight pipes placed on a round pedeſtal. The inſcription is PLACEA SPETRI, if it be not wrong copied, which we ſuſpect.

ORGANICAL, in the *Greek Muſic*, was ſynonimous with inſtrumental, or muſic played by inſtruments, which had a notation in characters different from the vocal, as may be ſeen in Bacchius and Alypius. See GREEK *Muſic*, and CHARACTERS.

ORGANICAL, or *Organic Diſeaſes*, are thoſe diſeaſes in which the ſtructure of ſome organ of the body is actually deranged, and its functions conſequently impeded.

Diſorder of function, however, does not neceſſarily imply derangement of ſtructure: all diſeaſes, therefore, are not organic. Diſeaſed *action* of the vital and irritable parts will be attended with a diſordered ſtate of the functions, as well as diſeaſed *ſtructure* of the parts themſelves; and it is extremely important to diſtinguiſh between theſe two ſources of morbid ſymptoms. For the diſeaſes, which ariſe from the former ſource, are generally within the ready controul of medicine; whilſt thoſe, which originate from morbid ſtructure, are commonly beyond the reach of art; or at leaſt palliation of the ſymptoms, and the retardation of the progreſs of the morbid condition, are all that art can effect, except in the early ſtage of ſtructural change.

This ſtatement may be illuſtrated by a view of the diſeaſes of the ſtomach; ſome of which are the reſult of morbid action of the muſcular coat, or of the ſecretory veſſels, excited by irritation in the organ itſelf, or by ſympathy with ſome other organ; and ſome ariſe from actual organic changes of ſtructure in the ſubſtance of the viſcus. Thus pain and ſickneſs, amounting even to vomiting, may be excited, in a very irritable condition of the ſtomach, by the ordinary food, or by any ſubſtance which is acrid, or not eaſily digeſted: this irritability, again, may be occaſioned by a particular ſtate of the nervous ſyſtem in general, or of that of the ſtomach in particular, or it may be merely ſympathetic of a diſeaſed condition of the brain, or of a calculus in the kidnies, &c. Under any of theſe circumſtances, the diſorder of the ſtomach is not organic; there is no derangement of its ſtructure, nothing which the eye could detect, if it had acceſs to the interior parts of the body; and the morbid action of the organ may be perfectly cured, either by diminiſhing the general or local exceſs of irritability, by appropriate medicines, or by curing the diſeaſes of the brain, the kidney, &c., of which the ſtate of the ſtomach is merely ſympathetic. But, on the other hand, pain and ſickneſs in that organ may be connected with a morbid change in its ſtructure; as, for example, with a chronic inflammation of its coats, or with a ſcirrhous or cancerous ſtate of the organ, eſpecially about the pylorus, or paſſage into the bowels. Scirrhus or cancer of the ſtomach, as of other organs, is ſcarcely within the power of medicine, the object of which is, therefore, limited to an alleviation of the ſymptoms, by means of anodynes, light, liquid, and digeſtible diet, in ſmall quantities, and laxatives.

Organic diſeaſes are not always diſtinguiſhable, in their commencement, from mere diſorders of function. They often proceed for a conſiderable time, without any great derangement of the functions themſelves, and with intervals even of total freedom from any morbid ſymptoms; ſo that they are often only diſcovered to be organic, by the pertinacity with which they continue, until at length, not only the functions of the diſeaſed organ are greatly impaired, but a hectic or habitual fever comes on, the ſtrength ſinks, and general emaciation evinces the failure of the functions of nutrition, which a fixed diſeaſe in any important organ ultimately produces.

It is only upon diſeaſes that are organic, that diſſection after death throws any light: and it has taught us to connect certain ſymptoms during life, with certain changes of ſtructure in particular organs; inſomuch that a ſkilful obſerver will commonly be able, from marking the ſymptoms, to point out the organ diſeaſed, and the nature of the morbid change that is going on. Hence the obvious value of *morbid anatomy*,

*anatomy*, as it has been called, to the phyſician. Nevertheleſs, it is to be lamented, that this value is of leſs practical importance than it ſeems to be at firſt ſight: for the animal machine differs materially from all other mechaniſm, inaſmuch as we have not the means of replacing the parts that are become uſeleſs or decayed, nor even of rectifying the derangement of ſtructure, which we know has taken place, if it have already made any conſiderable progreſs. The principal practical advantage, derived from ſuch knowledge, conſiſts in the early detection of incipient organic diſeaſe, while its progreſs may yet be arreſted, and in the prevention of all violent meaſures, in the later ſtages, when palliation is all that can be hoped for. For although much alleviation of pain and ſuffering is within the power of art, yet much injury may ſometimes reſult from the fruitleſs adminiſtration of ſtrong medicines.

The various organic diſeaſes of the body, will be found deſcribed under their reſpective appellations.

ORGANICAL *Deſcription* of curves is the method of deſcribing them on a plane by means of inſtruments. See CURVE.

ORGANICAL *Part*, is that part of an animal or plant deſtined for the performance of ſome particular function. See ORGAN.

ORGANICAL *Parts*, in Buffon's ſyſtem of generation. See GENERATION.

ORGANISER *le Chant*, in the beginning of counterpoint, was to introduce ſome thirds at the cloſes of a chant in uniſon: for example, when one part of the chorus ſung C, D, B, C, the other ſung at the ſame time C, D, D, C. It appears by theſe examples, cited by the abbé le Bœuf, and by others, that organiſation was ſeldom practiſed except upon the ſharp 7th, or note ſenſible at a cloſe; hence it follows, that it was always the minor third which conſtituted this new harmony. For a concord ſo eaſy, and affording ſo little variety, the ſingers who organiſed had a particular remuneration. With regard to the *organum triplum*, or *quadruplum*, which was alſo ſimply called *triplum* or *quadruplum*, it was nothing elſe but the ſame chant with the parts organiſed with the counter-tenor in the octave to the baſe, and by the treble in the octave to the tenor.

ORGANNA, in *Geography*, a town of Spain, in the province of Catalonia; 18 miles N. of Solſona.

ORGANO, in Corelli's concertos, and in general all concertos compoſed in Italy for the church, is the ripieno baſe appropriated to the organ.

ORGANZINE, in the *Silk Trade*. See SILK.

ORGAS, in *Geography*, a town of Spain, in New Caſtile; 12 miles S.S.E. of Toledo.

ORGASM, οργασμος, denoting violence, or turgeſcency; formed from οργαω, *turgeo*, *I ſwell*, an ecſtacy or impetuous deſire of coition, occaſioned by a turgeſcency of the ſeminal veſſels, which are no longer able to reſtrain their contents.

The ancients alſo extend orgaſm to the other humours, and even excrements, which being accumulated, and coming to ferment, demand excretion.

Quincy uſes orgaſm for an impetuous or too quick motion of the blood, or ſpirits; by which the muſcles are diſtended with an uncommon force.

ORGE, L', in *Geography*, a river of France, which runs into the Seine, 30 miles S. of Paris.

ORGELET, a town of France, in the department of the Jura, and chief place of a canton, in the diſtrict of Lons-le-Saulnier; 12 miles S. of it. The place contains 1224, and the canton 10,014 inhabitants, on a territory of 245 kiliometres, in 40 communes. N. lat. 45° 31. E. long. 5° 41'.

ORGERES, a town of France, in the department of the Eure and Loire, and chief place of a canton, in the diſtrict of Chateaudun; 12 miles S.W. of Janville. The place contains 286, and the canton 6927 inhabitants, on a territory of 310 kiliometres, in 18 communes.

ORGIA, a town of Etruria; ſix miles S.W. of Sienna.

ORGIA, οργια, in *Antiquity*, feaſts and ſacrifices performed in honour of Bacchus, inſtituted by Orpheus, and chiefly celebrated on the mountains by wild, diſtracted women, called *Bacchæ*.

Euſebius derives the word απο της οργης, *fury*, *madneſs*.

Others from ορος, *mountain*; becauſe Orpheus removed from Thrace to mount Citheron: others from οργας, a place conſecrated to ſome divinity: others from ειργειν, *to remove*, *to repulſe*; in regard the profane were to be driven away.

The orgia were alſo called Orphica, from their inſtitutor; and Bacchanalia, Dionyſia, and Liberalia. It is a fact agreed upon by both mythologiſts and antiquaries, that the orgies derived their original from Egypt; and that they owe their inſtitution to Iſis, who having recovered the diſſipated members of her huſband, murdered by the conſpirators, headed by Typhon his brother, and being unable to find the virile parts, which the fiſhes of the Nile had devoured, conſecrated the repreſentation of them, which the prieſts in after times carried about in the feſtivals inſtituted in honour of that prince. It is alſo another allowed fact, that Orpheus and Melampus, in their travels to Egypt, had ſeen the feſtivals of Oſiris celebrated, and introduced them into Greece. Bacchus, it is ſaid, in honour of whom the orgies were celebrated, is the ſame with Oſiris. From Greece the orgies paſſed into Phrygia; and the knowledge of them was brought into Italy, either by the Arcadians, when they planted a colony in Latium, or by Æneas himſelf with his Trojans, who had previouſly celebrated this feſtival.

They were held every third year. The chief ſolemnities were in the night-time; and were attended with all manner of impurities.

They were carried to ſuch an exceſs, that in the year of Rome 568, the ſenate was obliged to aboliſh them through the whole empire. And Cicero informs us, that Diagondas aboliſhed theſe infamous feſtivals at Thebes.

The women who preſided over theſe feaſts were called Orgiaſtæ: and the men who performed the ſame office were denominated Orgiophantæ.

Servius ſays, that at firſt orgia was a common name for all kinds of ſacrifices among the Greeks, of the ſame import with the word *ceremoniæ* among the Romans.

ORGITANO, in *Biography*, a Neapolitan performer and compoſer for the harpſichord in 1770, the beſt which Naples could boaſt; but, as a player, much inferior to many at that time in England; and as a compoſer, he was ſurpaſſed, both in force and good taſte, by thouſands in Germany. But the Neapolitans, ſince the time of Memo Scarlatti, have never piqued themſelves on inſtrumental excellence. Vocal compoſitions and vocal perfection in performance, are the grand deſideratum, not only at Naples, but of all Italy.

ORGON, in *Geography*, a river of Chineſe Tartary, which riſes in N. lat. 46° 56'. E. long. 101° 20', and runs into the Selingue, N. lat. 50°. E. long. 106° 14'. Near this river, in N. lat. 48° 57'. E. long. 104° 36', an aſſembly of the Kalkas Tartars was held in 1698.—Alſo, a town of France, in the department of the mouths of the Rhone, and chief place of a canton, in the diſtrict of Taraſcon; 17 miles E. of Taraſcon. The place contains 2401, and the canton 9401 inhabitants, on a territory of 235 kiliometres, in eight communes.

ORGUES, in *Fortification*, thick long pieces of wood,

pointed and ſhod with iron, and hung each by a ſeparate rope over the gateway of a city, ready on any ſurprize or attempt of the enemy to be let down to ſtop up the gate.

The ends of the ſeveral ropes are wound round a windlas, by means of which they may be all let down together.

Orgues are preferable to herſes, or portcullices, becauſe theſe may be either broke by a petard, or they may be ſtopped in their falling down; but a petard is uſeleſs againſt an orgue; for if it break one or two of the pieces, they immediately fall down again, and fill up the vacancy; or if they ſtop one or two of the pieces from falling, it is no hindrance to the reſt; for being all ſeparate, they have no dependence upon one another.

Orgues are alſo uſed for a machine compoſed of ſeveral harquebuſs or muſquet-barrels, bound together; by means of which ſeveral exploſions are made at the ſame time; uſed to defend breaches, and other places attacked.

Orgues, *des*, Fr. (See Organ.) The firſt organ that was ſeen in France, and ſent to king Pepin, cauſed great aſtoniſhment. Charlemagne, the ſon of Pepin, received another from the emperor Michael. Eginard ſays that this was an hydraulicon. In the eccleſiaſtic interdictions the organ uſed to be ſilenced.

Organs were admitted into convents about the tenth century. In the time of St. Louis, every ſpecies of wind inſtrument had admiſſion in the divine offices. We read in the annals of this prince, how devoutly he cauſed the maſs to be ſung, and the whole ſervice *à chant et à déchant, à ogre et à triple*, with the organ and trumpet.

ORGYA, ὀργυια, an ancient Grecian meaſure, containing ſix feet.

Some repreſent the orgya as the Grecian pace.

Heſychius deſcribes it as the ſpace comprehended between the two hands, when the arms are extended; anſwering to the Roman ulna, and our fathom.

ORHAI, in *Geography*, a town of Moldavia, on the Reut; 66 miles E.N.E. of Jaſſi.

ORI, a town of Sardinia; 8 miles S. of Saſſari.

ORIA, a town of Spain, in the province of Granada; 19 miles S of Hueſca.

Oria, or *Oira*, a town of Naples, in the province of Otranto; the ſee of a biſhop united to Tarento: founded by a colony of Cretans. Here Servilius, one of the officers of Octavius Cæſar, was ſurpriſed by Mark Antony; 45 miles N.W. of Otranto.

ORIAGO, a town of Italy, in the Paduan, on the Brenta; 12 miles E. of Padua.

ORIBASIA, in *Botany*. See Psychotria.

ORIBASIUS, in *Biography*, an eminent phyſician of the fourth century, was born at Pergamus, or, as ſome have aſſerted, at Sardes, where he reſided for ſome time. He was educated at the ſchool of Zeno the Cyprian, who appears to have taught at Sardes at that time, though he afterwards became one of the moſt celebrated profeſſors of Alexandria. Oribaſius is mentioned by his contemporary, Eunapius, as one of the moſt learned and accompliſhed men of his age, and the moſt ſkilful phyſician; and his talents and agreeable manners not only raiſed him to great public reputation, but obtained for him the friendſhip of the emperor Julian, who appointed him quæſtor of Conſtantinople. His elevation, and his ſteady adherence to the principles of Julian, however, procured him many enemies; and after the death of that prince, in the year 363, his fortune ſuffered a ſevere reverſe. Perſecution was carried againſt him ſo far, that he was ſtripped of his property, and, under Valentinian II., was ſent into baniſhment among the Barbarians. He ſuſtained his misfortunes with great fortitude; and the dignity of his character, together with his ſingular profeſſional ſkill and kindneſs, gained him the reſpect and veneration of theſe rude people, among whom he was adored as a tutelary god. At length, however, he was recalled to the imperial court, and regained the public favour. Eunapius repreſents him as again flouriſhing in wealth and reputation at Conſtantinople, at the time when he wrote the lives of the philoſophers, which was near the year 400.

Oribaſius was principally a compiler; but, on certain practical points, as Freind obſerves, he has made ſome valuable remarks, which are not to be found in preceding writers. At the requeſt of the emperor Julian, he made an extenſive compilation from Galen and all the other preceding medical authors, in ſeventy, or according to Suidas ſeventy-two books, which are entitled his "Collections." But of theſe only the firſt fifteen books remain, together with two others, which are called by Raſarius, his tranſlator, the 24th and 25th of the ſeries, and which treat of anatomy. In this work are preſerved many paſſages of ancient writers not to be met with elſewhere, and others are given with more accuracy than in the extant works of the authors themſelves. He afterwards drew up an epitome, or "Synopſis" of this great work, for the uſe of his ſon Euſtathius, reducing the whole to nine books. This ſynopſis is ſtill extant; as well as four books, on medicines and diſeaſes, addreſſed to his friend Eunapius, entitled "Euporiſtorum, *i. e.* paratu facilium, &c. Libri." Photius mentions two other works of Oribaſius, that were extant in his time, one conſiſting of four, the other of ſeven books, which were merely an epitome of Galen's works and dedicated to Julian. This epitome is mentioned by Paulus; but it is now loſt, as well as ſome other tracts mentioned by Suidas. The theoretical and anatomical parts of the writings of Oribaſius are almoſt purely tranſcripts from thoſe of Galen; whence he has been by ſome nicknamed Galen's ape. But although his books do not contain a great deal that is original, and did not perhaps contribute to the advancement of the art, yet they rank among the more valuable of the medical works of antiquity. He was a great collector of recipes and ſpecific remedies, many of which were afterwards received upon his authority. He ſpeaks in terms of much praiſe, however, of the ſucceſs of local evacuations of blood, eſpecially by ſcarifications, a practice which had not been much noticed by preceding writers. He employed this remedy in ſuppreſſion of the catamenia, in head-ache, inflammation of the eyes, difficulty of breathing, &c. even in perſons of advanced age; and he affirms, that he was himſelf cured of the plague by it, when it raged in Aſia, having loſt two pounds of blood from the thighs, on the ſecond day of the diſeaſe. Oribaſius firſt deſcribed a ſingular ſpecies of inſanity, which he called *lycanthropia*, in which the patient wanders about by night among the tombs, as if he were transformed into a wolf. His full and curious deſcription of this diſeaſe has been copied by Paul, Actuarius, and others, without addition or alteration, and ſeems to relate to that ſpecies of melancholy, which occurred in the demoniac, mentioned in the New Teſtament, who abode among the ſepulchres.

Various editions and Latin tranſlations of the writings of Oribaſius have been publiſhed at different times and places. The whole works were printed at Baſle, in three volumes folio, in 1557, and in the "Artis Medicæ Principes" of Stephanus. The commentaries on the aphoriſms of Hippocrates, which were publiſhed under his name by Guinther, are obviouſly ſpurious, as Dr. Freind has ſhewn; and the two little tracts, "De Laqueis et Machinamentis," collected from Heracles and Heliodorus, are ſomewhat doubtful. See Freind, Hiſt. of Phyſ. Gen. Biog. Eloy Dict. Hiſt. de la Med.

ORICHALCUM, or AURICHALCUM, braſs. See BRASS.

It is evident, from all accounts, that the orichalcum of the ancients was a fictitious ſubſtance, not a natural metal. They made it on the ſame baſis that we make braſs at preſent; but they had ſeveral ways of doing it, and diſtinguiſhed it into ſeveral kinds. They had a white ſort in frequent uſe and great eſteem; and even the yellow they diſtinguiſhed into two principal ſorts, under different names. The orichalcum and æs flavum, braſs and yellow copper, are with us ſynonimous terms, but with them they were uſed to expreſs different combinations of the ingredients.

ORICHALCUM, or *Aurichalcum album, white braſs.* This was a metal well known among the ancients, and celebrated by Ariſtotle and by Strabo, and others, under the name of χραμα λευκον. It was made by mixing an earth with copper, while in fuſion; but what that earth was, we are not informed.

None of our methods ſeem to be the ſame with their's, ſince the metal is debaſed by all our's, and becomes brittle; whereas in their management, according to their own accounts, it ſeems not to have loſt any thing of its ductility, though it acquired a peculiar brightneſs.

ORIEL WINDOW, in *Architecture*, a projecting angular window, moſtly of a triagonal or pentagonal form, and divided by mullions and tranſoms into different bays and other compartments. Theſe windows are not peculiar to the pointed ſtyle, as in the barbarous ſtyle which ſucceeded it, during the reigns of Elizabeth and James I., they became ſtill more common than they had been before in the pointed ſtyle.

ORIENT, ORIENS, in *Geography* or *Aſtronomy*, the eaſt, or eaſt point of the horizon.

It is thus called from the Latin, *oriri, to ariſe*; becauſe it is in this point the ſun riſes.

ORIENT, *Equinoctial*, is uſed for that point of the horizon wherein the ſun riſes when he is in the equator, or when he enters the ſigns Aries and Libra. See SPRING and AUTUMN.

ORIENT, *Æſtival*, is the point wherein the ſun riſes in the middle of ſummer, when the days are longeſt.

ORIENT, *Hybernal*, is the point where the ſun riſes in the middle of winter, when the days are ſhorteſt.

ORIENT, *L'*, in *Geography*, a ſea-port town of France, and the principal place of a diſtrict and ſeat of a tribunal, in the department of the Morbihan, ſituated at the mouth of the river Scorf, and built in the year 1720. The harbour is good, but not capable of receiving many ſhips of war. The town contains 19,922, and the two cantons 24,722 inhabitants, on a territory of 87½ kiliometres, in three communes. N. lat. 47° 45'. E. long. 3° 16'.

ORIENTAL, ſomething ſituated towards the eaſt with regard to us: in oppoſition to *occidental*.

In this ſenſe we ſay, oriental pearls, *q. d.* ſuch as are found in the Eaſt Indies. (See PEARL.) Oriental languages, meaning the Hebrew, Syriac, Chaldee, and Cophtic. (See LANGUAGE.) In aſtronomy a planet is ſaid to be oriental, when it appears in the eaſt before the ſun. See RISING.

ORIENTAL *Bezoar*. See BEZOAR.

ORIENTAL *Bibles*. See BIBLE.

ORIENTAL *Emerald*. See EMERALD.

ORIENTAL *Philoſophy*, is ſometimes uſed for the philoſophy of the Eaſt, or that of the Perſians, Chaldæans, and Arabians, &c. See ARABIAN, BARBARIC, CHALDEAN, PERSIAN, &c. *Philoſophy*. See alſo BRACHMANS, EGYPT, MAGI, &c. It appears, from adverting to the hiſtory of the ancient philoſophy of the Eaſt, that, from the moſt remote times, the Oriental philoſophers endeavoured to explain the nature and origin of things by the principle of *emanation* (which ſee), from an eternal fountain of being. That through ſucceeding ages this doctrine remained, and was taught in ſchools of philoſophy in the more civilized regions of Aſia and Africa, is highly probable from various conſiderations. Nevertheleſs, this ſpecies of philoſophy did not exiſt under any diſtinct name, nor can it be referred, with certainty, to any ſingle author or leader; but a certain metaphyſical ſyſtem, chiefly reſpecting the derivation of all natures, ſpiritual and material, by emanation from the firſt fountain, was before the commencement of the Chriſtian era taught in the Eaſt, whence it gradually ſpread through the Alexandrian, Jewiſh, and Chriſtian ſchools. It is well known, that at the riſe of the Grecian ſects, the eaſtern countries were frequently viſited by the ſages who travelled in ſearch of wiſdom. We learn from Clemens Alexandrinus (Stromat. lib. i.), who was well acquainted with Oriental hiſtory, that the Greeks borrowed what was moſt valuable in philoſophy from barbarians; for philoſophy was publicly taught by the Brachmans, the Odryſii, the Getæ, the Chaldæans, the inhabitants of Arabia Felix and Paleſtine, the Perſians, and many other nations. Amongſt the Grecian philoſophers who travelled into the Eaſt was Democritus, who viſited Perſia, after the ſchools of the Magi had been reformed by Zoroaſter, and travelled to Chaldæa, and other eaſtern countries, for the ſake of learning philoſophy. Of the nature of the philoſophy which Democritus and others found in theſe ſchools, we obtain ſome idea from the declaration of Pliny (Hiſt. Nat. c. 30.), who ſays of Democritus, that he undertook, what might be more properly called an exile than a journey, for the purpoſe of learning "magical philoſophy," and returning home, taught it, in his myſteries, from the writings of certain Oriental philoſophers, which he illuſtrated. Accordingly the philoſophy of Democritus appears to have been of two kinds; public, or that of the Eleatic ſect; and ſecret, in which he followed the myſteries of the Chaldæan, Perſian, and other eaſtern Magi. Hence we may conclude, that the Oriental philoſophy ſubſiſted, without interruption in the Eaſt, through the period of the Grecian ſects.

The uninterrupted continuance of the Oriental philoſophy may be further inferred from the ſudden riſe, and rapid ſpread, of thoſe numerous hereſies, which, under the oſtentatious name of Gnoſticiſm, over-ran the churches of the Eaſt. (See GNOSTICS.) Porphyry, in his preface to a work of Plotinus againſt the Gnoſtics, ſays, that there were at that time many hereties, among whom were ſome, who, deriving their hereſy from the "ancient philoſophy," were followers of Adelphinus. From this and ſimilar paſſages it may be inferred, that prior to the appearance of the Gnoſtic hereſies amongſt the Chriſtians, a ſyſtem, well known by the name of the "ancient philoſophy," exiſted in the Eaſt; that this philoſophy is not to be ſought among the Greeks, not even in Plato himſelf, but is oppoſed to the Grecian philoſophy, as more ancient and more conſonant to the truth; that this philoſophy was commonly underſtood to have been taught by Zoroaſter; and that the Chriſtian Gnoſtics forged books, under the name of Eaſtern philoſophers, from which they pretended to derive their genealogics of emanations from the firſt fountain of intelligence. Hence alſo appears the reaſon, why Plotinus determined to ſpend eleven years in the Eaſt, "to explore the philoſophy taught among the Perſians and Indians." That the Gnoſtic hereſies were of eaſtern origin may be further concluded from other circumſtances, which it is not neceſſary now to mention. It deſerves, moreover, to be conſidered, that if all the ſyſtems of philoſophy, diſtinct from thoſe of the Grecian ſects, which became famous in

Aſia

Aſia or Egypt, particularly if the Egyptian, Cabbaliſtic, Gnoſtic, and Eclectic, be compared, there will be found among them a wonderful agreement with the general principles of that ſyſtem which we call the Oriental philoſophy; whence it ſeems reaſonable to admit the exiſtence of this philoſophy as a common ſource, and to make uſe of it as an univerſal key to unlock the myſteries of the reſt.

Upon the whole we may conclude, that the Oriental philoſophy, as a peculiar ſyſtem of doctrines concerning the divine nature, originated in Chaldæa, or Perſia; whence it paſſed through Syria, Aſia Minor, and Egypt; and mixing with other ſyſtems, formed many different ſects. There ſeems alſo to be ſufficient ground for referring the formation of the leading doctrines of this philoſophy into a regular ſyſtem to Zoroaſter, whoſe name the followers of this doctrine prefixed to ſome of their ſpurious books, and whoſe ſyſtem is fundamentally the ſame with that afterwards adopted by the Aſiatic and Egyptian philoſophers. Among the branches from the Zoroaſtrian ſtock we muſt reckon the Gnoſtic hereſies, which aroſe ſo early in the Chriſtian church. They differ materially from the Platonic doctrine from which they have been ſuppoſed to be derived, as Plotinus has fully ſhewn in his treatiſe againſt the Gnoſtics. The mixture of Platonic notions that are found in the Aſiatic philoſophy, as well as of Oriental doctrines among the later Platoniſts, may be eaſily accounted for from the intercourſe which ſubſiſted between the Alexandrian and Aſiatic philoſophers, after the ſchools of Alexandria were eſtabliſhed. From that time many Aſiatics, who were addicted to the ſtudy of philoſophy, viſited Alexandria, and became acquainted with the celebrated doctrines of Plato; and blending theſe with their own, formed an heterogeneous maſs of opinions, which in its turn mixed with the ſyſtems of the Alexandrian ſchools. This union of Oriental and Grecian philoſophy was further promoted by the diſperſion of the philoſophers of Alexandria in the reign of Ptolemy Phyſcon; many of whom, to eſcape from tyranny, fled into Aſia, and opened ſchools in many places.

It was probably at the time when the Platonic philoſophers of Alexandria viſited the Eaſtern ſchools, that certain profeſſors of the Oriental philoſophy, prior to the exiſtence of the Chriſtian hereſies, borrowed from the Greeks the name of Gnoſtics, to expreſs their pretenſions to a more perfect knowledge of the divine nature, than others poſſeſſed. That theſe philoſophers aſſumed this vaunting appellation before their tenets were transferred to the Chriſtians, may be concluded from this circumſtance, that we find it, among the Chriſtians, not appropriated as a diſtinct title to any ſingle ſect, but made uſe of as a general denomination of thoſe ſects, which, after the example of the Pagan philoſophers, profeſſed to have arrived at the perfect knowledge of God. The Pagan origin of this appellation ſeems alſo plainly intimated in two paſſages in St. Paul's epiſtles; in one of which he cautions Timothy againſt αντίθεσις της ψευδωνύμου, "the oppoſition of falſe ſcience" (1 Tim. vi. 20.); and in the other (Coloſſ. ii. 8.) warns the Coloſſians not to be impoſed upon by a vain and deceitful philoſophy, framed according to human tradition and the principles of the world, and not according to the doctrine of Chriſt. We may conclude, upon the whole, that the tenets of the Gnoſtics exiſted in the Eaſtern ſchools long before the riſe of the Gnoſtic ſects in the Chriſtian church under Baſilides, Valentine, and others; but for want of original documents concerning the Oriental philoſophy, we can form no idea of its peculiar tenets, only by comparing the ancient doctrines of the Eaſt with that of thoſe ſects which ſpring from this ſtock. The Gnoſtics were chiefly employed in ſupporting the ſyſtem of divine emanation, taught by Zoroaſter and his followers. They maintained that all natures, intellectual and material, are derived by a ſucceſſion of emanations from the infinite fountain of Deity. From this ſecret and inexhauſtible abyſs, they conceived ſubſtantial powers, or natures, of various orders to flow; till at the remote extremity of the emanation, evil dæmons, or matter, with all the natural and moral evils neceſſarily belonging to it, were produced. Brucker's Phil. by Enfield, vol. ii.

The firſt principles of the Oriental philoſophy, as Moſheim ſtates them, ſeem perfectly conſiſtent with the dictates of reaſon; for its firſt founder muſt undoubtedly have argued in the following manner: "There are many evils in this world, and men ſeem impelled by a natural inſtinct to the practice of thoſe things which reaſon condemns; but that eternal Mind, from which all ſpirits derive their exiſtence, muſt be inacceſſible to all kinds of evil, and alſo of a moſt perfect and beneficent nature; therefore the origin of thoſe evils, with which the univerſe abounds, muſt be ſought ſomewhere elſe than in the Deity. It cannot reſide in him who is all perfection; and therefore it muſt be without him. Now there is nothing without or beyond the Deity, but matter; therefore matter is the centre and ſource of all evil, of all vice." Having taken for granted theſe principles, they proceeded farther, and affirmed, that matter was eternal, and derived its preſent form, not from the will of the ſupreme God, but from the creating power of ſome inferior intelligence, to whom the world and its inhabitants owed their exiſtence. As a proof of this aſſertion, they alleged, that it was incredible, that the ſupreme Deity, perfectly good, and infinitely removed from all evil, ſhould either create or modify matter, which is eſſentially malignant and corrupt, or beſtow upon it, in any degree, the riches of his wiſdom and liberality.

The Oriental philoſophers were divided in their opinion, when they proceeded to argue from theſe principles. Some imagined two eternal principles, from whence all things proceeded; the one preſiding over light, and the other over matter; and, by their perpetual conflict, explained the mixture of good and evil, that appears in the univerſe. Others maintained, that the being which preſided over matter was not an eternal principle, but a ſubordinate intelligence, one of thoſe whom the ſupreme God produced from himſelf. They ſuppoſed, that this being was moved, by a ſudden impulſe, to reduce to order the rude maſs of matter, which lay excluded from the manſions of the Deity, and alſo to create the human race. A third ſort fell upon a ſyſtem different from the two preceding, and formed to themſelves the notion of a triumvirate of beings, in which the ſupreme Deity was diſtinguiſhed both from the material, evil principle, and the creator of this ſublunary world. Theſe, then, were the three leading ſects of the Oriental philoſophy, which were ſubdivided into various factions, by the diſputes that aroſe, when they came to explain more fully their reſpective opinions, and to purſue them into all their monſtrous conſequences.

The diviſions among the various ſects of theſe philoſophers, did not prevent their holding, in common, certain opinions concerning the Deity, the univerſe, the human race, and ſeveral other ſubjects. They were unanimous in acknowledging the exiſtence of an eternal nature, in whom dwelt the fullneſs of wiſdom, goodneſs, and all other perfections, and of whom no mortal was able to form a complete idea. This great Being was conſidered by them as a moſt pure and radiant light, diffuſed through the immenſity of ſpace, which they called pleroma, a Greek word which ſignifies *fullneſs*; and they taught concerning him and his operations, the following things: "The eternal nature, infi-

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nitely perfect and infinitely happy, having dwelt from everlasting in a profound solitude, and in a blessed tranquillity, produced, at length, from itself, two minds of a different sex, which resembled their supreme parent in the most perfect manner. From the prolific union of these two beings others arose, which were also followed by succeeding generations; so that, in process of time, a celestial family was formed in the pleroma. This divine progeny being immutable in its nature, and above the power of mortality, was called by the philosophers, *æon*," a term which signifies, in the Greek language, an eternal nature. How many in number these *æons* were, was a point much controverted among the Oriental sages. See ÆON.

"Beyond the mansions of light, where dwells the Deity with his celestial offspring, there lies a rude and unwieldy mass of matter, agitated by innate, turbulent, and irregular motions. One of the celestial natures descending from the pleroma, either by a fortuitous impulse, or in consequence of a divine commission, reduced to order this unseemly mass, adorned it with a rich variety of gifts, created men, and inferior animals of different kinds to store it with inhabitants, and corrected its malignity by mixing it with a certain portion of light, and also of a matter celestial and divine. This creator of the world is distinguished from the supreme Deity by the name of demiurge. His character is a compound of shining qualities, and insupportable arrogance; and his excessive lust of empire effaces his talents and his virtues. He claims dominion over the new world he has formed, as his sovereign right; and, excluding totally the supreme Deity from all concernment in it, he demands from mankind for himself and his associates, divine honours.

"Man is a compound of a terrestrial and corrupt body, and a soul which is of a celestial origin, and, in some measure, an emanation from the divinity. This nobler part is miserably weighed down and encumbered by the body, which is the seat of all irregular lusts and impure desires. It is this body that seduces the soul from the pursuit of truth, and not only turns it from the contemplation and worship of the Supreme Being, so as to confine its homage and veneration to the creator of this world, but also attaches it to terrestrial objects, and to the immoderate pursuit of sensual pleasures, by which its nature is totally polluted. The sovereign mind employs various means to deliver his offspring from this deplorable servitude, especially the ministry of divine messengers, whom he sends to enlighten, to admonish, and to reform the human race. In the mean time, the imperious demiurge exerts his power in opposition to the merciful purpose of the Supreme Being, resists the influence of those solemn invitations, by which he exhorts mankind to return to him, and labours to efface the knowledge of God in the minds of intelligent beings. In this conduct, such souls, as, throwing off the yoke of the creators and rulers of this world, rise to their supreme parent, and subdue the turbulent and sinful motions, which corrupt matter excites within them, shall, at the dissolution of their mortal bodies, ascend directly to the pleroma. Those, on the contrary, who remain in the bondage of servile superstition, and corrupt matter, shall, at the end of this life, pass into new bodies, until they awake from their sinful lethargy. In the end, however, the supreme God shall come forth victorious, triumph over all opposition, and, having delivered from their servitude the greatest part of those souls that are imprisoned in mortal bodies, shall dissolve the frame of this visible world, and involve it in a general ruin. After this solemn period, primitive tranquillity shall be restored in the universe, and God shall reign with happy spirits, in undisturbed felicity, through the everlasting ages." Mosheim's Eccl. Hist. vol. i. &c. 8vo.

After all it is not easy to form any very consistent and intelligible notion of the sentiments, either of the Oriental philosophers, or of the ancient Gnostics, who sprung from them. The Gnostics, according to Brucker's account of them, conceived the emanations from Deity, which we have already mentioned, to be divided into two classes; the one comprehending all those substantial powers, which are contained within the divine essence, and which complete the infinite plenitude of the divine nature; the other existing externally with respect to the divine essence, and including all finite and imperfect natures within the divine essence. They, with wonderful ingenuity, imagined a long series of emanative principles, to which they ascribed a real and substantial existence, connected with the first substance as a branch with its root, or a solar ray with the sun. When they begun to unfold the mysteries of this system in the Greek language, these substantial powers, which they conceived to be comprehended within the πληρωμα, divine plenitude, they called αιωνες, æons; and they discoursed about them with as much confidence and familiarity, as if they had been objects of sight. The notions which they entertained of these æons, like the Platonic notion of ideas, was that of beings which existed distinctly and substantially. Within this series they included the Demiurgus, or maker of the world, whom they supposed to have been an æon, so far removed from the first source of being as to be allied to matter, and capable of acting upon it. Having conceived both the spiritual and material world to have flowed from the same fountain, their system required substantial virtues, or powers, of two kinds, active and passive; hence, in their figurative and emblematical language, they speak of male and female æons.

ORIFICE, ORIFICIUM, the mouth or aperture of a tube, pipe, or other cavity.

There are some operations in chemistry, where the orifices of the vessels must be sealed hermetically.

ORIFICE, in *Anatomy*, is particularly applied to the mouths of the several ducts, vessels, and other cavities; as of the bladder, uterus, stomach, &c.

The upper orifice of the stomach is the part where hunger is felt; the lower orifice is called the *pylorus*.

ORIFICE is also used by extension, for the aperture of a wound or ulcer.

ORIGANUM, in *Botany*, an ancient name, borrowed from the Greeks, and formed of ορος, *a mountain*, and γανος, *joy*, in allusion to its place of growth and agreeable fragrance. Dioscorides has several species of his οριγανος, which are easily referrible to some one or other of ours. Linn. Gen. 297. Schreb. 393. Willd. Sp. Pl. v. 3. 132. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 638. Prodr. Fl. Græc. Sibth. v. 1. 416. Ait. Hort. Kew. ed. 2. v. 3. 411. Juss. 115. Tourn. t. 94. Lamarck Illustr. t. 511. Class and order, *Didynamia Gymnospermia*. Nat. Ord. *Verticillatæ*, Linn. *Labiatæ*, Juss.

Gen. Ch. *Cal.* a spiked involucrum, composed of ovate, imbricated, coloured leaves; perianth unequal, various. *Cor.* of one petal, ringent; tube cylindrical, compressed; upper lip erect, flat, obtuse, notched; lower in three deep nearly equal segments. *Stam.* Filaments four, thread-shaped, as long as the corolla, two of them longest; anthers simple. *Pist.* Germen superior, four-cleft; style thread-shaped, directed towards the upper lip of the corolla; stigma very slightly divided. *Peric.* none, except the closed calyx, containing the seeds in its lower part. *Seeds* four, ovate.

Ess. Ch. Cone quadrangular, spiked, with one leaf to each calyx. Upper lip of the corolla erect, flat; lower in three deep equal segments.

Obs. The involucrum affords the essential character of this genus. The perianth is, in some species, nearly equal,

of

of five teeth; in others two-lipped, the upper lip large and undivided, the lower ſcarcely diſcernible; in a few ſpecies it is two-lipped.

1. O. *ægyptiacum*. Egyptian Marjoram. Linn. Sp. Pl. 822. (Zatarhendi; Alpin. Egypt. ed. 1. t. 40. ed. 2. t. 95.) —Leaves orbicular, fleſhy, downy. Spikes leafleſs.—A native of Egypt. Not rare in greenhouſes, where it flowers in the ſummer. The *ſtem* is buſhy and woody. *Leaves* numerous, oppoſite, ſtalked, orbicular, entire, obtuſe, about half an inch wide, tapering at the baſe, fleſhy, downy on both ſides, highly fragrant when rubbed, with a nutmeg-like ſcent. *Flowers* ſmall, whitiſh, in denſe, cluſtered, terminal, hairy, obtuſe ſpikes.

2. O. *Dictamnus*. Dittany of Crete. Linn. Sp. Pl. 823. Curt. Mag. t. 298.—Lower leaves woolly. Spikes drooping. —Native of rocks in Crete, nor did the late profeſſor Sibthorp find it in any other place in the Levant. The *ſtem* is ſhrubby. *Leaves* ovate, clothed with looſe wool, aromatic, but not ſo ſweet-ſcented as the former. *Involucrum* lax, purpliſh, ſmooth, dotted with reſinous points. This, the celebrated δικταμνος of the Greeks, was reported to cauſe the arrows to drop out of the wounded goats, as ſoon as they taſted it; ſee Ælian. It has been cultivated in our greenhouſes as long, perhaps, as any other exotic.

3. O. *Tournefortii*. Dittany of Amorgos. Sibth. in Ait. Hort. ed. 1. v. 2. 311. ed. 2. v. 3. 412. Willd. n. 4. Andr. Repoſ. t. 537. (O. Dictamni cretici facie, folio craſſo, nunc villoſo, nunc glabro; Tourn. Cor. 13. Voy. v. 1. 91, t. 91.)—Leaves ſomewhat fringed. Spikes oblong, erect. Corolla with a ſpur.—Native of rocks in the iſland of Amorgos, near the convent of the virgin. This has the habit of the laſt, but the *leaves* are more rigid, and nearly ſmooth, except at their edges; *ſpikes* longer, erect, and of very numerous *flowers*, whoſe *corolla* has a ſhort ſpur, an eſſential mark of diſtinction between this ſpecies, which therefore ought to have been called *calcaratum*, and the laſt.

4. O. *ſipyleum*. Dittany of Mount Sipylus. Linn. Sp. Pl. 823. (O. montis Sipyli; Herm. Lugd. Bat. t. 463.) —Leaves ovate, acute, all ſmooth. Spikes drooping.—Native of mount Sipylus, in Phrygia, and mount Delphi in the Negropont, as well as by the road ſide between Smyrna and Burſa. *Sibth.* An elegant perennial herbaceous ſpecies, kept occaſionally in our greenhouſes, of a ſlender habit, with rather glaucous naked *leaves*, and ſhort, ſolitary, lax, drooping, purple *ſpikes*.

5. O. *creticum*. Cretan Marjoram. Linn. Sp. Pl. 823. (O. Onites; Tourn. Inſt. 199. Genuina græcorum hyſſopus; Lob. Ic. 494. f. 2.)—Leaves ovate, nearly entire, with roughiſh veins. Spikes cluſtered, oblong, erect. Leaves of the involucrum ovate, acute, membranous, ſmooth.— Native of the ſouth of Europe; a hardy perennial with us, flowering in July and Auguſt. This has much the habit of the Common Marjoram of Britain, hereafter deſcribed, but the long ſlender *ſpikes* diſtinguiſh it, both from that and the following. *O. creticum* is the Wild *Origanum*, or Marjoram, of Dioſcorides and of the modern Greeks.

6. O. *ſmyrnæum*. Smyrna Marjoram. Linn. Sp. Pl. 823. Sm. Fl. Græc. Sibth. t. 571, unpubliſhed. (O. glanduloſum; Desfont. Atlant. v. 2. 27. Willd. n. 11.)— Leaves ovate, roughiſh, nearly entire. Spikes nearly globoſe, obtuſe, hairy, collected into a corymboſe head.— Gathered by Wheeler and Sibthorp about Smyrna. The latter found it alſo on heaths about Conſtantinople. The Turks call it *Sater*, the modern Greeks ζίγανι, or Marjoram. This appears, by Vaillant's herbarium, to be the *O. heracleoticum, cunila gallinacea Plinii, floribus candidis;* Tourn. Inſt. 199, which is cited by Linnæus from Bauhin, under *O. heracleoticum*. The excellent deſcription in Desfontaines, leaves no doubt as to his ſynonym. We thus get rid of one ſpecies of Willdenow. The round, hairy *ſpikes*, collected into a broad-topped corymboſe tuft, mark the plant before us.

7. O. *heracleoticum*. Winter Sweet Marjoram. Linn. Sp. Pl. 823. Lob. Ic. 492. Matth. Valgr. v. 2. 60. Ger. em. 666.—Leaves ovate. Spikes elongated, ſtalked, cluſtered. Involucrum the length of the calyx.—Native of the ſouth of Europe. Dr. Sibthorp found it frequent on the dry hills of Greece. It has long been a hardy perennial in gardens, flowering from June to November, and is nearly related to the next, as well as to *O. creticum*.

8. O. *vulgare*. Common Marjoram. Linn. Sp. Pl. 824. Curt. Lond. faſc. 5. t. 39. Engl. Bot. t. 1143. Woodv. Med. Bot. t. 164. Camer. Epit. 469. (O. anglicum; Ger. em. 666.)—Leaves ovate. Spikes roundiſh, panicled, cluſtered, ſmooth. Involucrum ovate, longer than the calyx. —Native of Europe, in dry hilly places. With us it chiefly occurs in thickets, on chalk or limeſtone, flowering in July and Auguſt. The whole herb has a hot aromatic taſte and ſmell, like thyme. The *root* is perennial, ſomewhat creeping. *Stems* hairy, purple. *Leaves* entire, dark green, dotted, rather hairy. *Spikes* numerous, cluſtered, denſe, ſhort, and ovate; their *involucrum* dark purple; *corolla* roſe-coloured. Bees are fond of the flowers.

9. O. *onites*. Pot Marjoram. Linn. Sp. Pl. 824. (O. lignoſum ſyracuſanum perenne, umbellâ ampliſſimâ brevi, lato & nervoſo folio nigricante; Bocc. Muſ. 43. t. 38. Majorana cretica, origani folio, villoſa, ſatureiæ odore, corymbis majoribus albis; Tourn. Cor. 13, by his own herbarium.)—Leaves heart-ſhaped, downy. Spikes oblong, obtuſe, hairy, cluſtered.—Native of Sicily, the ſouth part of Greece, and the neighbouring iſlands of the Archipelago. A pale hairy plant, with white *flowers*, in ſhort blunt crowded ſpikes, whoſe involucral leaves are hairy, and ſtrongly fringed. This plant appears in Hudſon's Fl. Anglica, but erroneouſly, what Dillenius meant appearing to be rather a variety of *O. vulgare*.

10. O. *Majorana*. Sweet Knotted Marjoram. Linn. Sp. Pl. 825. Zorn Ic. t. 41. (Amaracus vulgatior; Lob. Ic. 498.)—Leaves ſtalked, obovate, finely downy, obtuſe. Spikes roundiſh, compact, downy, cluſtered.—Native of Portugal, long cultivated in gardens, where it is either biennial or perennial, always requiring a little ſhelter. Its ſoft downy habit, and ſweet aromatic ſcent, nearly approach *O. ægyptiacum*. The *corolla* is white. Willdenow's *O. majoranoides* ſeems to us a variety; and *O. ſyriacum*, Linn. Sp. Pl. 824, of which there is no ſpecimen in the Linnæan or Bankſian herbarium, appears by Lobel's Ic. 499, to be probably the ſame ſpecies as that of which we are ſpeaking.

11. O. *Maru*. Lavender Marjoram. Linn. Sp. Pl. 825. Sm. Fl. Græc. Sibth. t. 573, unpubliſhed. (Maru creticum; Alpin. Exot. t. 288. Majorana cretica rotundifolia, lavandulæ odore, capitulis minoribus incanis, flore purpuraſcente; Tourn. Cor. 13, from his own herbarium.)— Leaves ovate, ſeſſile, downy. Spikes roundiſh, cluſtered, downy, ſomewhat lax.—Native of mountains in Crete. A ſlender elegant ſpecies, unknown in our gardens. The *leaves* are ſmall, hoary, as are the *ſpikes*. *Corolla* purpliſh red.

We know nothing of *O. ciliatum*, Willd. n. 5, nor of *benghalenſe*, n. 6. The former is a native of Guinea; the latter of Bengal; ſee Burm. Ind. t. 38. f. 3. which figure by no means favours the idea of its belonging to the genus in queſtion.

ORIGANUM, in *Gardening*, affords plants of the herbaceous, annual, and under-ſhrubby perennial kinds, of which

the ſpecies cultivated are, the common marjoram (O. vulgare); the pot marjoram (O. onites); the ſweet or knotted marjoram (O. majorana); the winter ſweet marjoram (O. heracleoticum); the Egyptian marjoram (O. Egyptiacum); and the dittany of Crete or Candia (O. dictamnus).

Of the firſt there are varieties with white flowers, and light-green ſtalks; with purple flowers, and with variegated leaves; which is ſometimes cultivated in gardens, under the title of *pot marjoram*, uſed in ſoups.

The fourth ſort is at preſent commonly known by the name of *winter ſweet marjoram*, but was formerly called *pot marjoram*, being chiefly uſed for noſegays, as coming ſooner to flower than ſweet marjoram.

And there is a variety of it with variegated leaves.

*Method of Culture.*—The firſt four ſorts may be readily increaſed by ſlips, cuttings, and parting the roots, and in the firſt and third ſorts alſo by ſeeds.

The ſeed ſhould be procured freſh from the ſeed-ſhops, and be ſown in the early ſpring months, as March or the following month, on a bed or border of good light mould, raking it in lightly. When the plants are up, and have attained a few inches in growth, they ſhould be planted out during moiſt weather, in a warm dry ſituation, in rows ten or twelve inches diſtant, to remain, water being given occaſionally till they become perfectly rooted. When the plants are deſigned for the borders or clumps, the ſeeds may be ſown in patches where the plants are to remain.

The roots of the ſtrongeſt plants may be parted, ſo as to have ſome root-fibres to each in the early autumn or ſpring ſeaſon, and be planted out in rows in the ſame manner as thoſe raiſed from ſeed; having the ſame management afterwards till freſh rooted. The ſlips or cuttings of the branches ſhould be taken off in the ſummer, and immediately planted out where the plants are to remain.

All the ſorts ſhould be afterwards kept perfectly clean from weeds during the ſummer ſeaſon, and in the autumn have the decayed ſtalks cleared away, looſening the mould about the plants; and when in beds, digging the alleys and throwing a little of the earth over the beds.

Where neceſſary the plants may be removed into the pleaſure ground, with ſmall balls of earth about their roots, either in the autumn or early ſpring.

The other tender kinds may be increaſed by planting ſlips or cuttings of the young ſhoots, in the ſpring and ſummer months; in the former ſeaſon in pots of light earth, plunging them in a mild hot-bed, but in the latter either in pots or warm ſhady borders; water being immediately given, and occaſionally repeated in ſmall proportions, being covered down by hand glaſſes in the latter caſe, to expedite their rooting; being removed, when the plants begin to ſhoot at the top. In the autumn the plants may be removed into ſeparate ſmall pots, and afterwards treated as the more hardy plants of the green-houſe kind.

The three firſt ſorts are uſeful as culinary plants, as well as ornamental in the borders of the pleaſure ground; and the other kinds afford variety in the green-houſe collections.

ORIGANUM, in the *Materia Medica*. See MARJORAM.

ORIGEN, in *Biography*, one of the moſt celebrated fathers of the church, who flouriſhed in the third century, was born in Alexandria in the year 184 or 185, and was ſurnamed Adamantius, either on account of his indefatigable application to ſtudy, or of the incredible firmneſs with which he endured the perſecutions to which his profeſſion of Chriſtianity expoſed him. By Porphyry he is ſuppoſed to have been born of heathen parents, and educated in their religious principles; but Euſebius, who wrote his life, has ſhewn moſt ſatisfactorily that his parents were Chriſtians, and that they took the greateſt poſſible care of his education. In his childhood he excited the greateſt expectations from his quick improvement in ſeveral parts of knowledge, eſpecially from his exact and profound acquaintance with the holy ſcriptures. He is ſaid to have felt difficulties in the courſe of his reading which his father Leonides was ſcarcely able to ſolve, and he would reprove the youth for aſpiring to a knowledge of things that ſeemed to be above his age; at the ſame time parental attachment led him to believe that his ſon was intended for great things, and he even hoped that he was honoured with the indwelling of the divine ſpirit. When Origen was of a proper age, he became a catechumen in the Chriſtian ſchool of Alexandria, under Clement, by whom he was introduced to an acquaintance with the firſt principles of philoſophy, and impreſſed with a perſuaſion of its utility as preparatory to the ſtudy of Chriſtian truth. After this he attended the philoſophical ſchool of the celebrated Ammonius Saccas, the founder of the Eclectic philoſophy, which was frequented by Pagans and Chriſtians: here he made a great proficiency in the ſtudy of philoſophy, and became intimately acquainted with the writings of the Greek philoſophers; at the ſame time, by his talents and unwearied induſtry, he made himſelf maſter of all the learning of the age. In the year 202, when the perſecutions of the Chriſtians broke out under the emperor Severus, Origen loſt his father, who was firſt thrown into priſon, and ſoon afterwards ſuffered martyrdom. On this occaſion, the love which Origen bore for his father, and for the truth, on account of which he was doomed to ſuffer, excited in him ſo earneſt a deſire to die in the ſame cauſe, and at the ſame moment, that his mother found it neceſſary to hide his clothes to prevent him from going abroad, and throwing himſelf into the way of his perſecutors. Being reſtrained from ſealing the truth with his blood, he wrote a letter to his father, in which he exhorted him to conſtancy, and not to be moved from his ſtedfaſtneſs by compaſſion for his wife and ſeven children. The martyrdom of Leonides being followed by the confiſcation of his property, his wife and children had, at firſt, nothing to rely on for ſupport but the bounty of a rich and honourable lady of Alexandria, till Origen, though now but ſeventeen years of age, was enabled to furniſh them with the means of ſubſiſtence by teaching grammar. In this undertaking he met with great ſucceſs, and his ſchool was crowded with young men, both of Chriſtian and Pagan families. At this time the terror of perſecution had cauſed ſo many to abſcond or flee from the city of Alexandria, that there was no one in the public ſchool to teach the principles of the Chriſtian religion, and many heathens came to Origen, deſiring to be taught by him. The firſt of theſe was Plutarch, who obtained the honour of martyrdom. The ſecond was Heraclius, Plutarch's brother, who became biſhop of Alexandria after the death of Demetrius. Origen was not more than eighteen years of age when he was ſelected to preſide over the catechetical ſchools by appointment of Demetrius: in which important office he gained univerſal eſteem by his frequent viſits, and the other kind offices that he performed, to the confeſſors in priſon, whether ſtrangers or friends. No leſs than ſeven of his ſcholars ſuffered martyrdom, one of whom was a woman. At this time there was no ſtated ſalary for the preſident of the ſchool at Alexandria, and Origen was ſo unwilling to receive a gratuity from thoſe whom he inſtructed in the rudiments of the Chriſtian religion, that he preferred ſelling the books which he had collected with great care, agreeing with the purchaſer for four oboli, equal to five pence, to be paid him daily. It was while he was very young, ſcarcely more than twenty years of

age, that he was guilty of that raſh and unjuſtifiable action, which he intended, as well to preſerve him from temptation, as to fulfil upon himſelf, in a literal ſenſe, the ſaying of Chriſt, when he ſpeaks of thoſe "who make themſelves eunuchs for the kingdom of heaven." He was afterwards ſatisfied of his error, and publicly confuted in his writings the literal interpretation of that text, in ſuch a manner, as to ſhew that he condemned himſelf.

About the year 213 he went to Rome, having a deſire to ſee the moſt ancient church of the Romans. Having made a ſhort ſtay there, he returned to Alexandria, and applied himſelf with great diligence to the ordinary work of teaching the principles of religion. His reputation was now ſo great, and the number of his diſciples increaſed ſo much, that he found it neceſſary to have an aſſiſtant, and ſelected for this purpoſe Heraclius, who becamc biſhop of Alexandria after the death of Demetrius. About this time he made himſelf acquainted with the Hebrew language, and compoſed his "HEXAPLA;" which ſee. This work induced numbers of learned perſons to reſort to Alexandria, for the ſake of improving by his converſation and inſtructions, among whom was Ambroſe, a wealthy man, who encouraged him to write commentaries upon the ſcriptures, by furniſhing him with what books he required, and by being at the expence of maintaining ſeven or more amanuenſes to write down what he dictated, and as many young women or others, who excelled in the art of writing, to copy his works. After this he went into Arabia, at the invitation of a prince of that country, to inſtruct him in the principles of Chriſtianity. During the perſecutions of the emperor Caracalla he withdrew into Paleſtine, where, at the deſire of the biſhops of the country, he publicly explained the ſcriptures to the people in the churches, and preached in their preſence, though he was only a layman. On his return to Alexandria, he reſumed his office in the ſchool, and alſo his biblical ſtudies. From theſe he was again called by Mammea, mother of the cmperor Alexander, who ſent for him to come to her at Antioch, that ſhe might enjoy the benefit of his converſation on religious ſubjects. On his return he remained at Alexandria till the year 228, when Demetrius ſent him on buſineſs to Achaia, and in the courſe of his journey he was ordained preſbyter at Cæſarea, a circumſtance that gave great offence to Demetrius, who had long been jealous of his increaſed and increaſing reputation, and from this time his conduct towards Origen was marked by the moſt determined and violent enmity. He procured a decree to be paſſed, that not only prohibited Origen from teaching any more in the city, but pronounced a ſentence of baniſhment upon him; and he afterwards prevailed on a ſecond council of Egyptian biſhops to depoſe him from the office of preſbyter. The biſhop of Rome and other prelates concurred in the ſentence; but the biſhops of Paleſtine, Arabia, Phœnicia, and Achaia, who were well acquainted with his extraordinary merit, and knew him perſonally, refuſed to join in his condemnation, and continued to entertain the reſpect for him to which he was juſtly entitled. In the mean time Origen had retired to Cæſarea in Paleſtine, where he was well received by the biſhop of that city and the biſhop of Jeruſalem, who determined to ſupport him, and commiſſioned him to deliver interpretations of the ſcriptures, and other religious inſtructions. He opened a ſchool here, in which he taught ſacred and profane learning to a numerous train of diſciples. About the year 240, Origen took a ſecond journey to Athens, where he probably ſtaid ſome length of time, ſince he finiſhed at that place his "Commentary" upon Ezekiel, and began that upon Canticles.

When Origen was about ſixty years of age, he permitted the diſcourſes which he made to the people to be taken down by ſhort-hand writers: of theſe there were more than a thouſand, being accuſtomed to preach daily, with little, or ſcarcely any preparations. About the ſame period he wrote his eight books againſt Celſus, his "Commentaries" upon the minor prophets, and upon the goſpel by St. Matthew. During the Decian perſecution, and in the year 250, he ſuffered much with exemplary and invincible fortitude, on account of his great zeal in the Chriſtian cauſe. Though far advanced in life, he was impriſoned and chained down to his place, and in ſuch a ſituation as to excite the moſt excruciating pains. But neither his ſufferings nor the threats of his perſecutors, could ſhake his conſtancy, or induce him to behave in a manner in the leaſt unworthy of his Chriſtian profeſſion. From his own letters it appears that he ſurvived this perſecution, and afforded arguments for conſolation to others who might be placed in the ſame or ſimilar circumſtances. He died, and was buried at Tyre, in the time of Gallus, in the 70th year of his age. His works were very numerous; but though ſeveral catalogues of them were compoſed, none of them are remaining. It was ſaid he had written 6000 volumes, to which Dr. Lardner ſeems to give credit; but, according to Jerome, they did not amount to more than a third part of that number. A large part of his works is entirely loſt, and of thoſe that remain, the greateſt portion conſiſts of Latin tranſlations, made by Jerome and Ruſinus, chiefly the latter; nevertheleſs, ſays Dr. Lardner, "we ſtill have, in the original Greek, Origen's treatiſe of Prayer: his Exhortation to Martyrdom, addreſſed to Ambroſe and Protoctetus, written in the perſecution under Maximin: his Apology for the Chriſtian Religion, in eight books, againſt Celſus the Epicurean, compoſed, as ſome think, in the year 246, or, according to others, not before 249, an excellent performance, greatly eſteemed, not only by Euſebius and Jerome, but likewiſe by many judicious men of later times." Of the high eſtimation in which this extraordinary man was held, ſome notice muſt be taken. Jerome, in his work "De Viris Illuſtribus," calls him a man of immortal wit, and aſcribes to him a deep knowledge of logic, geometry, arithmetic, muſic, grammar, and rhetoric, and of the opinions of all ſects of philoſophers; ſo that there was a great reſort of perſons to him for the ſake of inſtruction: he alſo ſtyles him the greateſt doctor of the churches ſince the Apoſtles; in another place, he ſays, he would willingly undergo all the hatred Origen had ever met with, if he had but his knowledge of the ſcriptures: again, he adds, that Origen was a great man from his childhood, and the true ſon of a martyr; that he trampled the world under foot, vanquiſhing both the love of pleaſure and of riches, and that he had the ſcriptures by heart, and laboured day and night in ſtudying and explaining them. Sulpitius Severus ſays of Origen, "he wonders how one and the ſame man could be ſo different from himſelf: that where he is right, he had not had an equal ſince the Apoſtles." After reciting theſe and other teſtimonies to the character and talents of Origen, Dr. Lardner adds from his own reading, that "he had a capacious mind, and a large compaſs of knowledge; and throughout his whole life was a man of unwearied application in ſtudying and compoſing works of various ſorts, ſome of them extremely tedious and laborious, and in teaching by word of mouth, in the way of catechetical inſtruction, public diſcourſes to the people, and conference. He had the happineſs of uniting different accompliſhments, being at once the greateſt preacher, and the moſt learned and voluminous writer of the age: nor is it eaſy to ſay which is moſt admirable, his learning or his

virtue. In a word, it muſt be owned that Origen, though not perfect nor infallible, was a bright light in the church of Chriſt, and one of thoſe rare perſonages that have done honour to human nature." The ſame author enters at large into the nature and moral tendency of the works of Origen, concerning which we refer our readers to the third volume of his "Credibility;" it will be ſufficient for us briefly to notice ſome of the principal, which may be divided into two claſſes: the former conſiſting of works upon the ſacred ſcriptures; the latter of ſeparate treatiſes upon different ſubjects. We have already referred to the HEXAPLA, and ſhall, in the alphabetical order, give an account of the TETRAPLA, which was compiled for the uſe of ſuch ſcholars as could not procure the Hexapla, and which conſiſted of the Greek verſions of Aquila, Symmachus, the ſeventy Interpreters, and Theodotion. Theſe works afforded the hint for our Polyglott bibles. The other works of Origen upon the ſcriptures, conſiſted of Commentaries upon the books of the Old and New Teſtament, Scholia, and Homilies. In his Commentaries, the greater part of which is now loſt, he appears to have given full ſcope to his learning and imagination, in illuſtrating what was the hiſtorical or literal; the myſtical and moral ſenſe of the ſacred writings. Of his "Scholia," which were probably ſhort notes explanatory of difficult paſſages, none are now remaining; and of his "Homilies," we have only the tranſlations made by Jerome and Rufinus. In the works of Cave and Dupin will be found an account of theſe remains, and of the collections in which they are ſeparately preſerved. With regard to the ſeparate pieces of Origen on different and miſcellaneous ſubjects, we have, beſides thoſe to which we have already referred in this article, "A Letter to Africanus concerning the Hiſtory of Suſannah;" another "Letter to Gregory Thaumaturgus;" fragments of other "Letters," and "Philocalia," containing extracts out of Origen's works by Gregory Nazianzen and Baſil the Great; theſe are in Greek. The Latin tranſlations of Origen's pieces have been accuſed, and probably with great juſtice, with a want of fidelity: this is proved by the introduction into them of polemical terms which were not in uſe till after the council of Nice; and it has been ſuppoſed by ſome learned perſons that the pieces ſtill extant in Greek have been interpolated, or otherwiſe altered, to make Origen ſpeak more agreeably to modern orthodoxy upon original ſin, and other controverted points, than he really wrote or thought. The works of Origen, which are communicated to us only through the medium of Latin verſions, were collected by Merlin, and afterwards by Eraſmus, and publiſhed at Paris in 1512, and at Baſil in 1536, in two volumes folio. In 1574, a larger collection, including pieces tranſlated by the editor, was publiſhed at Paris under the care of Gilbert Genebrard, in two volumes, and was reprinted in 1604 and 1619. M. Huet, biſhop of Avranches, publiſhed in 1668 the Greek fragments of Origen's "Homilies," and his "Commentaries" upon the ſcriptures, with a Latin verſion, to which are prefixed copious and learned prolegomena, under the title of "Origeniana," containing an account of the life and writings of this father. In 1623, Michael Ghiſleri publiſhed at Rome Origen's "Commentary on the 28th chapter of the firſt book of Samuel," containing an account of Saul's viſit to the pretended witch at Endor, and fragments of his "Commentaries" on the prophecy of Jeremiah, with eight Homilies, on the ſame book. In 1605, Origen's "Eight Books againſt Celſus" were publiſhed in Greek with a Latin verſion by Gelenius, and the notes of Hæſchelius, and were afterwards given to the public more correctly at Cambridge in 1658 by William Spencer, who improved the tranſlation, and gave additional notes of his own. This edition compriſes the author's "Philocalia ſive de obſcuris Sacræ Scripturæ Locis." A complete edition of all the remains of Origen, in Greek and Latin, was commenced at Paris by Charles de la Rue, a Benedictine monk, in the year 1733: the editor died in 1739, when only three volumes of his work were publiſhed; but it was continued after his death by his nephew, Charles Vincent de la Rue, a member of the ſame religious community, *viz.* St. Maur, who publiſhed the fourth and laſt volume in the year 1759. Cave. Dupin. Lardner, vol. ii. edit. 1788. p. 442—544. Enfield's Hiſt. Phil. vol. ii. See alſo our article ORIGENISTS.

ORIGEN, a Gentile philoſopher, and a contemporary of the foregoing, was the diſciple and friend of Porphyry, and alſo ſtudied philoſophy under Ammonius. This perſon has ſometimes been confounded with the Chriſtian Origen; but he is the ſame whom Plotinus ſucceeded in the philoſophical chair, and of whom mention is made by Longinus, Porphyry, Hierocles, Eunapius, Proclus, and others.

ORIGENIANS, ORIGENISTS, or *Origeniani*, in *Eccleſiaſtical Hiſtory*, a ſect of ancient heretics, who reſembled or even ſurpaſſed the abominations of the Gnoſtics.

St. Epiphanius ſpeaks of them as ſubſiſting in his time, but in very ſmall number. He charges them with licentious principles, as well as ſhameful practices. He ſeems to fix their riſe about the time of the great Origen; but does not ſay they took their name from him. On the contrary, he diſtinguiſhes them from the Origeniſts, whom he derives from Origen Adamantius; adding, indeed, that they firſt took their name from one Origen; by which he intimates, that it was not the great Origen. And St. Auguſtine ſays expreſsly it was another. As to their doctrine, all that modeſty will allow to be ſaid is, that they rejected marriage; that they received and read divers ſcriptures of the Old and New Teſtament; that they uſed ſeveral apocryphal books, as the acts of St. Andrew, &c. and that, to excuſe their open crimes, they accuſed the Catholics of doing the ſame in private.

It is diſputed by learned moderns, whom theſe people followed, and from whom they were named. Baſnage thinks it likely that there was ſome other Origen, unknown to us, who was the author of this ſect. Baronius thought there was but one Origen about this time; and that theſe Origeniſts had their name from him: of this opinion alſo are Huet and Pagi. Dr. Lardner profeſſes himſelf much inclined to the ſame opinion; and to him it ſeems that the whole ſtory of the impure Origeniſts is unfounded. His reaſons are, that the ſtory depends entirely upon the authority of Epiphanius, and that the account itſelf is improbable in itſelf; becauſe it is hardly credible that men ſhould at any time avow principles and practices ſo abſurd and ſhameful as thoſe imputed to theſe people. Beſides, they made great pretenſions to ſtrict piety; and, moreover, if Epiphanius had had any certain knowledge or good information concerning theſe people, as a diſtinct ſect, he would have been able to ſay whom they followed; but he owns that he was an abſolute ſtranger as to that point. Hence Lardner concludes, that this ſect of impure Origeniſts is a fictitious and imaginary ſect; owing its ſuppoſed exiſtence to the calumnies of ſome bitter enemy of Origen and his admirers; the credulity of Epiphanius, and his too great facility in receiving the ſtories brought to him; together with his favourable ſentiments of the virtue of the great Origen; for, being perſuaded that Origen was a good man, when ſome angry, not to ſay wicked, people brought him the relations to which he refers, he concluded there was ſome ſect called Origeniſts, whoſe riſe and original he could not account for; and therefore he makes a diſtinct hereſy of them. As for the time in which theſe

people lived, it is ſufficient to ſay, that they were in being in the time of Epiphanius, and probably had their beginning when ſome perſons were diſtinguiſhed by the name of Origeniſts. Lardner's Works, vol. iii.

ORIGENISTS, followers of the opinions of Origen, a preſbyter of Alexandria, who, in the third century, maintained that Chriſt is only the Son of God by adoption; that the human ſoul had a pre-exiſtent ſtate, and had ſinned in heaven before the body was created; that the torments of the damned ſhall not be eternal, but that all intelligent beings ſhall be reſtored to order and happineſs, and that the devils themſelves ſhall be relieved at laſt.

Origen, as Moſheim repreſents him, was a man of vaſt and uncommon abilities, and the greateſt luminary of the Chriſtian world that the age in which he lived exhibited to view. Had the juſtice of his judgment been equal to the immenſity of his genius, the fervour of his piety, his indefatigable patience, his extenſive erudition, and his other eminent and ſuperior talents, all encomiums muſt have fallen ſhort of his merit. Yet ſuch as he was, his virtues and his labours deſerve the admiration of all ages, and his name will be tranſmitted with honour through the annals of time, as long as learning and genius ſhall be eſteemed among men. Dr. Lardner has ſummed up Origen's character in a paſſage, for which ſee ORIGEN. However, Origen, notwithſtanding his diſtinguiſhed abilities, was miſled by his imagination, and by that taſte for oriental philoſophy which prevailed in his time. Enchanted by the charms of this philoſophy, (ſee ORIENTAL *Philoſophy*), he ſet it up as the teſt of all religion, and imagined that the reaſons of each doctrine were to be found in that favourite philoſophy, and their nature and extent to be determined by it; nor can it be denied that many of the corruptions of Chriſtianity proceeded from this ſource. Hence ſprung both the ſcholaſtic and myſtic theology, and to the ſentiments that were now adopted, we may aſcribe the riſe of monks and hermits. Origen was alſo miſled by his imagination: for having entertained a notion that it was very difficult, if not impoſſible, to defend every thing in the ſacred writings from the cavils of heretics and infidels, ſo long as they were explained literally, according to the real import of the terms, he maintained that the ſcriptures were to be interpreted in the ſame allegorical manner that the Platoniſts explained the hiſtory of the gods. In conſequence of this pernicious rule of interpretation, he alleged, that the words of ſcripture were, in many places, abſolutely void of ſenſe; and that though in others there were, indeed, certain notions conveyed under the outward terms, according to their literal force and import, yet it was not in theſe that the true meaning of the ſacred writers was to be ſought, but in a myſterious and hidden ſenſe, ariſing from the nature of the things themſelves. This hidden ſenſe he endeavours to inveſtigate throughout his commentaries, neglecting and deſpiſing, for the moſt part, the outward letter. He divided this hidden ſenſe into moral, which diſplays thoſe doctrines that relate to the ſtate of the ſoul and the conduct of life; and myſtical or ſpiritual, which repreſents the nature, the laws, and hiſtory of the ſpiritual or myſtical world. This myſtical world he again ſubdivided into two diſtinct regions, one called the ſuperior, *i. e.* heaven; and the other the inferior, by which he meant the church. And thus he was led to another diviſion of the myſtical ſenſe into an earthly or allegorical ſenſe, adapted to the inferior world; and a celeſtial or anagogical one, adapted to the ſuperior region. Origen found a violent enemy in Demetrius, biſhop of Alexandria; who obliged him, in the year 231, to retire from his charge in Cæſarea: and farther, to ſatisfy his vengeance, he aſſembled two councils at Alexandria, in the firſt of which he condemned him unheard; and deprived him of his office; and in the ſecond had him degraded from the ſacerdotal dignity. In one of theſe councils, eſpecially the latter, Demetrius accuſed him of erroneous ſentiments in religion; for it was about this time that Origen publiſhed his "Book of Principles," which contains many of his peculiar opinions, which were reckoned of dangerous tendency. However, the character and doctrine of Origen were held by many, and eſpecially by the monks, in the higheſt veneration, and cheriſhed in this and the following centuries with a kind of extravagant enthuſiaſm. Hence many commotions were raiſed in the church, which were terminated by the fifth general council, aſſembled at Conſtantinople, by Juſtinian, A.D. 553, in which Origen and his followers were again condemned. The tenets of Origen which gave the greateſt offence were the following: *viz.* 1. That, in the Trinity, the Father is greater than the Son, and the Son than the Holy Ghoſt. 2. The pre-exiſtence of ſouls, which Origen conſidered as ſent into mortal bodies for the puniſhment of ſins committed in a former ſtate of being. 3. That the ſoul of Chriſt was united to the word before the incarnation. 4. That the ſun, moon, and ſtars, &c. were animated and endowed with rational ſouls. 5. That after the reſurrection, all bodies will be of a round figure. 6. That the torments of the damned will have an end; and that, as Chriſt had been crucified in this world to ſave mankind, he is to be crucified in the next to ſave the devils.

St. Epiphanius inſiſts very largely on the errors of this father: but, as he declares himſelf too warmly againſt him, there may be ſomewhat of exaggeration in what he ſays. Nor do St. Jerome, who in the earlier part of his life tranſlated many of Origen's works into Latin, and frequently commended him, calling him the greateſt doctor of the church ſince the times of the Apoſtles, or Theophilus of Alexandria, ſeem to have kept their zeal within the proper bounds in ſpeaking of Origen. When the Nitrian monks, baniſhed from Egypt on account of their attachment to Origen, took refuge at Conſtantinople, and were treated by St. Chryſoſtom, the biſhop of that city, with clemency and benignity, the elegant prelate was accuſed of being an Origeniſt, and condemned to baniſhment by the council of Chalcedon, in the year 403. Origeniſm ſpread itſelf chiefly among the monks of Egypt.

The myſtic theology of Origen ſeems to be adopted by our modern Quakers. On the ſubject of this article conſult Moſheim's Eccl. Hiſt. vol. i. Lardner's Works, vol. ii.

ORIGINAL, a firſt draught, deſign, or autograph, of any thing; ſerving as a model, or exemplar, to be imitated or copied.

Scarcely any of the ancient titles, tenures, &c. are now found in the originals. They are only vidimuſes, or copies collated from the originals.

ORIGINAL *Contract*. See CONTRACT.

ORIGINAL *Conveyances*. See CONVEYANCE.

ORIGINAL *of a Deed*, denotes that part or copy which is executed by the grantor, where the ſeveral parts of an indenture are interchangeably executed by the ſeveral parties; and the reſt are "counterparts;" though of late it is moſt frequent for all the parties to execute every part, which renders them all originals. See DEED.

ORIGININAL *Proceſs*. See PROCESS.

ORIGINAL, or *Original Writ*, is the beginning or foundation of the ſuit. When a perſon has received an injury, he is to ſeek legal redreſs by application or ſuit to the crown, for that particular ſpecific remedy which he is adviſed to purſue. In any action he is to ſue out, or purchaſe by paying

ing the ſtated fees, an *original* or original writ, from the court of chancery, in which all the king's writs are framed.

This is a mandatory letter from the king in parchment, ſealed with his great ſeal, and directed to the ſheriff of the county in which the injury is committed, or ſuppoſed ſo to be, requiring him to command the wrong doer or party accuſed, either to do juſtice to the complainant, or elſe to appear in court, and anſwer the accuſation againſt him. Whatever the ſheriff does in purſuance of this writ, he muſt *return* or certify to the court of common pleas, together with the writ itſelf: which is the foundation of the juriſdiction of that court, being the king's warrant for the judges to proceed to the determination of the cauſe. In ſmall actions, however, below the value of 40*s*. which are brought in the court-baron, or county-court, no royal writ is neceſſary; but the foundation of ſuch ſuits continues to be, as in the times of the Saxons, not by *original writ*, but by *plaint*; that is, by a privats memorial tendered in open court to the judge, wherein the party injured ſets forth his cauſe of action, and the judge is bound of common right to adminiſter juſtice therein, without any ſpecial mandate from the king. Now, indeed, the royal writs are held to be demandable of common right, on paying the uſual fees; for any delay in the granting of them, or ſetting an unuſual or exorbitant price upon them, would be a breach of Magna Carta, c. 29. "nulli vendemus, nulli negabimus, aut differemus juſtitiam vel certum,"

Original writs are either *optional* or *peremptory*; or, in the language of our lawyers, they are either a "præcipe" or a "ſi te fecerit ſecurum;" which ſee. Both ſpecies of writs are *teſte'd*, or witneſſed, in the king's own name; "witneſs ourſelf at Weſtminſter," or wherever the chancery may be held. (See RETURN and TERMS.) The next ſtep for carrying on the ſuit, after ſuing out the original, is called the *proceſs*; which ſee.

ORIGINAL *Sin*. See SIN.

ORIGINALIA, in the *Exchequer*, are records or tranſcripts ſent to the remembrancer's office out of chancery.

They differ from *recorda*, which contain the judgments and pleadings in ſuit tried before the barons.

ORIGINARY, ORIGINARII, among the Romans, an appellation given to ſlaves born in their maſter's houſes, who were otherwiſe called *vernæ*.

ORIHUELA, in *Geography*, called *Auriola* by the Romans, *Orzuella* by the Goths, *Orguella* by the Moors, and *Orihuela* by the Aragoneſe and the Spaniards, is a tolerably large town of Spain, in the province of Valencia, agreeably ſituated at the foot of the mountain of the ſame name, on both banks of the Segura, which runs through it, and which, on the confines of a beautiful country, forms the continuation of the Huerta of Murcia. This town was taken from the Conteſtani by the Carthaginians, from them by the Romans, and from theſe by the Goths; it was conquered by the Moors in 715, and at firſt formed part of the kingdom of Cordova; in 1057 it had its own king, but ſoon afterwards returned to the kings of Cordova; by a freſh revolution it became dependent on the new kingdom of Murcia, eſtabliſhed in 1236; it remained under the Moors for 550 years. It was taken from them in 1264 by James I. king of Aragon, who peopled it with Chriſtians, and in 1537, it received the title of city from Alphonſo V. In 1648, it was depopulated by the plague; and the overflowing of the Segura in 1651, deſtroyed a great part of it. This town is narrow, but as it winds round the foot of the mountain, its extent is conſiderable. It is tolerably well built; the ſtreets are in general airy, ſtraight, and broad, but not paved. The eleven principal ſtreets are handſome, and the broadeſt of them have pavements on each ſide. It has many regular edifices, and houſes of good appearance. It has two bridges over the Segura, ſeven gates, and five ſquares. It has no fountains, ſo that the inhabitants drink the water of the Segura. The population is about 20,000 perſons. In 1564, pope Leo X. eſtabliſhed a biſhop's ſee in this place, which has continued ever ſince, and it has a cathedral chapter. Here are three pariſh churches, nine monaſteries, three nunneries, a hoſpital for the ſick, a foundling hoſpital, and a tribunal for the cognizance of cauſes ariſing in the dioceſe. Beſides a number of officers for the civil and military adminiſtration, it has a garriſon of two ſquadrons of cavalry, or of dragoons. In this city is an univerſity, founded in 1556, for the four learned profeſſions; here are alſo one ſeminary and two colleges, one of which accommodates about 300 young men. A ſmall theatre was erected in this place by a private gentleman in 1791, and from the month of October to the month of April it is much frequented. At Orihuela they manufacture thoſe curious ſnuff-boxes with the roots of the terebinthus, called in Spaniſh "Cornicabra," which are ſo much admired on account of their beautiful ſhades, repreſenting landſcapes, &c. The inhabitants are commended for the ſuavity of their manners, and for the induſtry with which they cultivate the adjacent lands. The country about the town is very beautiful, and forms a ſucceſſion of gardens, producing abundance and variety of fruits, ſuch as oranges and lemons, almonds and pomegranates. The fertility of the ſoil has occaſioned a proverb, "rain or no rain, there is wheat in Orihuela." Here are raiſed ſilk-worms in great number; which furniſh the inhabitants with a new ſource of wealth. N. lat. 38° 7'. W. long. 1° 5'.

ORIHUELA, a town of Spain, in the province of Aragon; 18 miles N.W. of Albarracin.

ORIHVASI, a town of Sweden, in Tavaſtland; 40 miles N. of Tavaſthus.

ORIJAVA, a town of Spain, in the province of Granada; 12 miles N. of Motril.

ORILLAH, a town of Bengal; ſeven miles W. of Ramgur.

ORILLON, in *Fortification*, a ſmall rounding of earth, lined with a wall; raiſed on the ſhoulder of thoſe baſtions that have caſemates, to cover the cannon in the retired flank, and prevent their being diſmounted by the enemy. The method of deſcribing orillons and retired flanks, according to M. Vauban's firſt method, is ſtated under the article *Military* CONSTRUCTION.

ORIMATELA, in *Geography*, a town of Sweden, in the province of Tavaſtland; 45 miles E.S.E. of Tavaſthus.

ORING, a lake of Thibet, 63 miles in circumference. N. lat. 34° 47'. E. long. 97° 29'.

ORINGA, a ſea-port of Japan, in the iſland of Niphon.

ORINIACOORA, a town of Bengal; 15 miles N. of Nuldingah.

ORINOKO. See OROONOKO.

ORINZA, a town of Perſia, in the province of Irak; 41 miles E. of Iſpahan.

ORIO, or ORIA, a town of Spain, in Guipuſcoa, on the ſea-coaſt, at the mouth of a river of the ſame name, ſurrounded by walls; four miles W. of St. Sebaſtian.

ORIOLUS, the Oriole, in *Ornithology*, a genus of birds of the order Picæ, of which the generic character is: a conical, convex, very ſharp pointed and ſtraight bill; the upper mandible is a little longer than the lower, and obſcurely emarginated; the tongue is bifid and ſharp; and the feet are formed for walking. There are 51 ſpecies deſcribed in Gmelin's Linnæus; the birds are generally deſcribed as gregarious,

gregarious, noiſy, numerous, voracious, and great devourers of corn. The greater number of the ſpecies belonging to this genus are natives of the American continent; they are remarkable for the ſtructure of their neſt, which in ſome ſpecies hangs from the branch to which it is attached, and in others it is ſewed or faſtened with peculiar art beneath the ſurface of ſome very large leaf.

Species.

* Galbula, or Golden Oriole, ſometimes denominated the golden thruſh, is of a pale yellow colour; the lores and limbs are black; the outer tail-feathers on the hind part are yellow; the bill and irides are red; the legs plumbeous; the female is of a duſky browniſh-green; the lateral tail-feathers are of a yellowiſh-white. This is an inhabitant of our own country, and is found alſo in other parts of Europe, in Africa, and in Aſia, is about nine inches and a half long; is migratory; feeds on cherries, berries, and inſects. Its neſt is in the ſhape of a purſe, faſtened to the extreme divarications of the outmoſt twigs of tall trees, and compoſed of fibres of hemp, or ſtraw, mixed with fine dry ſtalks of graſs, lined within with moſs and lichens, upon which are arranged ſtill finer materials, as the ſilken bags of the chryſalides of moths; the egg-bags of ſpiders, feathers, &c. It is uſually obſerved to build generally in high trees, but places its neſt in rather a low part of the tree; the uſual number of eggs is four or five, and their colour a dull white, with numerous dark ſpecks. She ſits three weeks, and will not unfrequently ſuffer herſelf to be taken with the eggs and neſt, and continue to ſit on them in a cage till ſhe dies. The golden oriole is partial to grapes, figs, cherries, and inſects. It has a loud cry, and its fleſh is reckoned wholeſome and pleaſant to the taſte.

There are four other varieties of this ſpecies. 1. The black-headed oriole, deſcribed by Edwards under the title of the black-headed icterus, which differs in having the whole head and throat black, the greater quills black, longitudinally ſtreaked with yellow; the tail and bill reddiſh, and the legs duſky. It is a native of Madras. 2. The mottled oriole, which is yellow variegated with blackiſh ſpots; the head, neck, quill, and tail-feathers blackiſh. It inhabits Madras, and is deſcribed by Edwards under the title of the yellow Indian ſtarling. 3. The Chineſe oriole, whoſe limbs are black with yellow tips; head with a black band. It inhabits divers parts of China and Cochinchina. 4. The Indian oriole, of which the head is marked with a tranſverſe blue band; the tail-feathers are yellow with a blue bar; quill-feathers yellow ſpotted with blue. It inhabits India.

Radiatus; or Striped-headed Oriole. This ſpecies is tawny; the head, chin, and throat are black dotted with white; the remainder of the bird is orange-coloured. It is not aſcertained to what country this bird belongs; it is the ſize of a black-bird, the body is pale beneath; the legs are yellow; the claws are reddiſh.

Picus; Climbing Oriole. Tawny; the head, neck, and breaſt are ſpotted with white: the tail is rounded; the bill of a yellowiſh-grey; the legs are blackiſh. It is about ſeven inches long; inhabits among the trees in Guiana, which it climbs like a pie, and picks out inſects from under the bark.

Icterus; Icteric Oriole. This is alſo tawny; the head, throat, back, quill and tail-feathers are black; the wings are marked with a white ſpot. The bill is moſtly black with a brown baſe; the irides are yellowiſh; the legs are ſometimes black, and ſometimes lead-coloured, or of a greyiſh-white. It is about nine or ten inches long. It inhabits the warmer parts of America, and the Caribbee iſlands. It is domeſticated for the purpoſe of killing inſects. In its wild ſtate it is very agile and bold. It builds a large cylindrical neſt, ſuſpended to the end of a twig of a tree, with a view, no doubt, to defend its young from the attacks of ſnakes and other animals. Of theſe neſts ſeveral may ſometimes be ſeen near each other, and not far from houſes.

Novæ Hispaniæ; Mexican Oriole. This ſpecies is yellow; the head, chin, quill-feathers, and tail are black. It inhabits New Spain, whence it derives its ſpecific appellation. The bill is long and yellow.

Annulatus; Ring-tailed Oriole. This ſpecies is yellow; the head and neck black; the greater wing-coverts and quill-feathers are blackiſh, with a yellowiſh edge; the tail is annulate and blackiſh. It is deſcribed and figured by Seba, is the ſize of a pigeon, and is a native of South America.

Pictus; Painted Oriole. The front of this ſpecies is yellow; the nape orange-coloured; back yellow; cheeks, rump, and belly blueiſh; the ſhoulders are brown; the quill and tail-feathers are black. It is ſuppoſed to be an inhabitant of America.

Brasilianus; Braſilian Oriole. Yellow; breaſt ſpotted; head and back with pale brown ſpots; belly white; tail and wings brown; the latter tipt with whitiſh. It inhabits the ſhrubby places in Jamaica, and is four inches long. The bill is half an inch long; the orbits are yellow; legs brown, claws yellow.

Japacani; Japacani Oriole. The colour of this ſpecies is black mixed with a pale brown; beneath it is varied, with white and yellow, with tranſverſe black lines; head and tail blackiſh. Inhabits Braſil, and is eight inches long; the bill is black; the irides golden; the legs are of a dirty-white; claws ſharp and black. It is deſcribed by Ray, Willughby, and Latham.

Costototl; or New Spain Oriole. Black; beneath and tail variegated with ſaffron and black. It inhabits New Spain, and is about the ſize of a ſtarling. The young are ſaid to be yellow except the tips of the wings, which are black.

Griseus; Grey Oriole. This is varied with yellow and black; back, thighs and belly cinereous. It inhabits the woods of New Spain, is the ſize of the laſt; it does not ſing, and the fleſh is good.

Phœnicœus; Red-winged Oriole. This ſpecies is black, but the wing-coverts are tawny; it is the ſize of a ſtarling; the length being from eight to nine inches. It is to be met with in Mexico, the Carolinas, Virginia, and as far as New York. It builds a thick penſile neſt among reeds, or between the forks of trees, three or four feet from the ground, along with other birds, in ſwamps which are rarely acceſſible by man. In Louiſiana theſe birds appear only in winter, and ſometimes in ſuch immenſe flocks, that three or four hundred may be taken at one draught of the net. The nets are ſpread on ſome bare ſmooth path, at the ſide of a wood, with rice ſtrewed to decoy the birds. To ſecure the multitudes that are caught, it is often neceſſary to kill the greater part upon the ſpot. Their trivial or common name is "Maize-thief," which they have acquired from the circumſtance of their pecking a hole in the plant when green, and ſo deſtroying it. They are very bold, and not to be terrified with a gun, for notwithſtanding the ſportſman makes great ſlaughter in a flock, the remainder will take a ſhort flight, and ſettle again in the ſame field. There is a variety found in Africa with the ſhoulders red, edged with yellow.

Americanus; Red-breaſted Oriole, or Mocking-bird of Guiana. Black; chin, throat, breaſt, and upper corner of

of the wings red. It is ſeven inches long, is leſs than a black-bird, and inhabits Guiana and Cayenne. It ſings very pleaſantly, and imitates the notes of other birds. The neſt, which is built of hay, is long, cylindrical, twelve or fifteen inches in circumference, and hangs from the branches of the talleſt trees.

Oryzivorus; Rice Oriole. Black; head, neck, and breaſt with a purple ſhade. It inhabits Cayenne, and is nine inches long. The bill is about one inch and a half long, convex, and protuberant at the baſe.

Ludovicanus. This is variegated with black and white; the head, neck, belly, and rump are white; the wings and wedged-tail violet, edged with white. It inhabits North America, principally Louiſiana, and is ten inches long. The bill is black, and is about an inch long; the legs are of a lead-colour. There are two varieties of this ſpecies: 1. Blackiſh-brown; neck, breaſt, and wings ſpotted with black; head white, with a black ſpot on the crown. It is found in Hudſon's Bay. 2. Blackiſh-green; head, chin, outer quill-feathers, thighs, and ſtreaks on the breaſt white. This alſo is found in Hudſon's Bay.

Cristatus; Creſted Oriole. Creſted; lower part of the back, rump, and vent cheſnut; lateral tail-feathers yellow. This is the largeſt ſpecies yet known, and is a native of Surinam. It is about the ſize of a magpie, and its length is from eighteen to twenty inches. The colour of the male is black, with the lower part of the back, the rump, and vent cheſnut; and the lateral tail-feathers yellow. The head is furniſhed with a narrow recumbent creſt; the bill is of a dull yellow, and the legs black. The female is ſaid to be of an olive colour; the quills are duſky, and the tail yellow, as in the male, with the middle feathers black; the head is creſted, and the eyes in both ſexes are of a bright blue. Nothing is known of the particular hiſtory of this ſpecies, except that it feeds on inſects and fruits, and that it has a ſtrong ſcent, reſembling caſtor. "If," ſays Dr. Shaw, "it reſembles the majority of this genus in its manner of building, it may perhaps be the fabricator of the very large hanging neſt, deſcribed by Grew, in his account of the Muſeum of the Royal Society. It is above three quarters of a yard long, beſides part of it broken off: where broadeſt, near a foot over, and almoſt flat; narrowed from the bottom all the way to the top. It hath two apertures: above, about a foot from the top of the entire neſt, one larger and longer; below, that is, a foot above the bottom, another perfectly round, and three inches over: it conſiſts of the parts of plants ſomewhat looſely woven together." There are two varieties of this ſpecies: 1. One is of an olive-brown; beneath bay; the two middle tail-feathers cheſnut, the lateral ones yellow. It inhabits Cayenne, and is twenty inches long. The bill of this variety is yellow; hind-head with two long pendent briſtly feathers. 2. The body of this on the fore-part is green, the hind-part is cheſnut; the quill and two middle tail-feathers are black, the lateral ones yellow; the bill is red. It inhabits Cayenne, and is fourteen inches long.

Hæmorrhous; Red-rumped Oriole. This ſpecies, which is black, and the rump ſcarlet, inhabits Braſil, is eleven inches long, and is reckoned a very elegant ſpecies, though the colours are plain rather than ſplendid or glaring. Specimens have been ſeen, perhaps ſuch as had not attained their full colours, in which the back was of a brown tinge, the rump of a pale red, and the vent yellow. The neſt of this bird reſembles a narrow cucurbit with its alembic, the total length being about eighteen inches, but the interior cavity is only twelve inches; the upper part, by which it is attached, is denſe and ſtrong for about the length of ſix inches. The hæmorrhous prefers building on ſuch trees as overhang a river or lake. There is a variety which is found at Guiana, and which is of a blackiſh-brown colour, with a yellow vent.

Persicus; Black and Yellow Oriole. Black; hind-part of the back, ſpot on the wing-coverts, and baſe of the tail-feathers yellow. It is found in South America; forms a pendent neſt, ſimilar to the one juſt deſcribed, on the extreme branches of trees, of which there are ſometimes four hundred together. The eggs are of a dirty white, with ſmall pale brown ſpots. There are two varieties: 1. Black; hind-part of the back, ſpot on the wing-coverts, and outer tail-feathers above yellow at the baſe, all beneath half yellow and black. 2. Purpliſh-black; ſpot on the wings yellow, varied with black. The bill is yellowiſh; irides blue; legs and claws black.

Mexicanus; Black-crowned Oriole. Blackiſh; beneath and on the head yellow. It inhabits New Spain and Cayenne, and is nearly nineteen inches long. The bill, legs, and claws blackiſh; the neck is yellow; the crown black-brown; tail and wings black.

Ruber; Red Oriole. Vermilion; wings, belly, and tail deepeſt black. The bill and legs black; irides flame colour. This bird is of the ſize of a black-bird, and is found at Antigua, in the iſle of Panay, one of the Philippines.

Guianensis; Guiana Oriole. Blackiſh; edges of the feathers grey; breaſt and neck beneath red. It inhabits Guiana, as its name imports, and is above ſeven inches long. The tail is ſtriate with grey; the legs and claws are brown.

Flavus; Antigua Yellow Oriole. Golden; hind-part of the back, wings, and tail are black. The bill and legs are black; the irides are red. It is the ſize of a black-bird, and, according to Sonnerat, is a native of Antigua, in the iſle of Panay; but it is alſo found about the river Plata, in South America.

Baltimore; Baltimore Oriole. Blackiſh; beneath and band on the wings tawny. The bill is of a lead-colour; greater wing-coverts black, tipt with white; firſt quill-feathers dirty white, edged with white; two middle tail-feathers black, the reſt black on the lower part, and orange above. In the female, the head and back are olive, edged with browniſh; body beneath and tail-coverts yellow; tail grey, edged with white. This ſpecies is found in many parts of North America, occupying chiefly the more northern parts, advancing even to Montreal in the month of May, and returning ſouthward in winter, which accounts for their appearance in Maryland and Virginia at that time. They make their neſt of a ſoft downy matter, in the ſhape of a purſe, tying it with threads to the extreme forks of twigs of the tulip, plane, and hickory trees. The country people call them *fire-birds;* and indeed, when in high plumage, their motions from branch to branch not unaptly reſemble a flaſh of fire.

Spurius; Baſtard Oriole. Black; beneath tawny; wings with a white bar. It inhabits North America, is ſhorter than the Baltimore oriole; builds a penſile neſt, and lays five eggs. The lower part of the back and tail-coverts yellow; quill-feathers grey, edged with white; tail black, wedged. The head and neck of the female are of an olive colour; the chin is black; wing-coverts and tail-feathers grey, edged with white; tail dirty white, edged with yellow.

Textor; Weaver Oriole. This is of a yellow colour; head brown, with a ſhade of golden; quill and tail-feathers blackiſh, edged with orange. It inhabits near Senegal, and is

is of the ſame ſize as the golden oriole. "It was obſerved," ſays Mr. Latham, "in a cage where theſe birds were kept, that they entwined ſome of the ſtalks of the pimpernel, with which they were fed, in the wires. As this ſeemed to ſhew a diſpoſition of making a neſt, ſome ruſh-ſtalks were put into the cage; on which they preſently made a neſt, large enough to hide one at leaſt: but it was as often deranged as made, the work of one day being ſpoiled the next; ſerving to ſhew that the fabrication of the neſt, in a ſtate of nature, was the work of both male and female, and in all probability is finiſhed by the laſt. They had a ſharp but lively note.

Bonana; Bonana Oriole. This is alſo named the fulvous oriole, on account of its tawny colour. The head and breaſt are cheſnut; back, quill, and tail-feathers are black; the lower part, rump, belly, thighs, vent, and under wing-coverts orange-red; the vent is varied with cheſnut; the greater wing-coverts, quills, and tail are black; the bill is black, with greyiſh baſe; legs are grey. The female differs from her mate in being of a leſs lively colour. It is a native of the Weſt India iſlands, building its neſt in a remarkable manner of fibres and leaves, formed into the fourth part of a globe, and attached to the under-ſide of a banana leaf, in ſuch a manner that the leaf itſelf forms one ſide of the neſt, which, at firſt ſight, appears to be made of horſe-hair, but, on a nearer inſpection, is found to be compoſed of branched fibres, and which are in reality thoſe of the *Tillandria uſneoides*.

Nidipendulus; Hang-neſt Oriole. Frontlet and wreath black; crown, neck, back, and tail reddiſh-brown; breaſt and belly tawny-yellow. The bill is white; wings duſky-brown, mixed with white. This bird builds in woods, making its neſt of the internal fibres of the paraſitic plant, known in the Weſt Indies by the name of "old man's beard." It ſings charmingly, and places its neſt on the external branch of a high tree.

Varius; Cheſnut and Black Oriole. Black; beneath, rump, and leſſer wing-coverts ferruginous. It inhabits Cayenne, and is about ſix inches long.

Xanthornus; Leſſer Bonana Oriole. Pale yellow; chin, quill, and tail-feathers black. It inhabits Jamaica and New Spain, and is ſeven inches long. The wing-coverts are black, the greater part of them is edged with white.

Dominicensis; St. Domingo Oriole. Black; body on the hind-part, wing-coverts, and ſpot on the wings pale yellow. It is found in New Spain, Jamaica, and St. Domingo; is about eight inches long; builds a purſe-ſhaped neſt on the extreme branches of trees, hanging over water.

Jamacaii; Braſilian Oriole. This ſpecies is yellow; the head, throat, ſpot on the ſhoulders, wings, and tail black. It inhabits, as its trivial name imports, Braſil; fixes its neſt to a plantain leaf by means of filaments, and is ten inches long. The bill is black; wing-coverts have a white ſpot in the middle; the legs are brown.

Cayanensis; Yellow-winged Oriole. Black, with a yellow ſpot on the wings. Bill black; tail rounded, a little wedged at the tip.

Leucopterus; White-winged Oriole. Black, with a white ſpot on the wings. The female is of a cinnamon-brown colour, but beneath it is ſomewhat cinereous. It is a native of Cayenne and Surinam, and is about eight inches long.

Icterocephalus; Yellow-headed Oriole. Black; head and neck yellow. The bill is blackiſh; legs and claws brown. It inhabits Cayenne, and is ſeven inches long.

Melancholicus. This is the Schomburger of Edwards. It is grey, dotted with black, with a black band over the eyes. It is the ſize of a lark, which it conſiderably reſembles in colour. The bill and legs of a fleſh colour; the irides are bay; feathers with each a blackiſh ſpot in the middle; quill-feathers and tail blackiſh, edged with tawny brown; cheeks and chin black. It is a native of Mexico. There is a variety, in which the plumage is of a brighter caſt, or more inclining to orange-colour. The head is marked on each ſide by a white eye-ſtripe, bordered above and below with black; the irides are of a reddiſh-orange hue. It is found in Cayenne.

Capensis; Olive Oriole. This is, as its trivial name denotes, of an olive-brown colour, but beneath it is of a pale yellow. The bill, legs, and claws are brown; colour on the crown is inclining to grey, on the chin and throat to orange; the wing-coverts are brown, edged and tipt with olive; quill-feathers brown, edged with olive.

Cæruleus; Blue Oriole. Black, cinereous; head, wings, and tail blue. The bill is tawny. It is found at Madras.

Trifaciatus; Triple-ſtriped Oriole. Blueiſh lead-colour; the head has a triple ſtripe of black, and waved with black on the ſides; the lower part of the back and rump are of a jonquil yellow. This is an Indian bird.

Viridis; Yellow-throated Oriole. Green; eye-brows, cheeks, and chin yellow; ſome of the wing-coverts tipt with white. The bill is corneous; the legs grey. It inhabits Hudſon's Bay, and is about nine inches long.

Ferrugineus; Ruſty Oriole. Black; edge of the wings ruſty; head and neck purpliſh-black; belly of a dirty-aſh. The bill and legs are alſo of a dirty-aſh; the areas of the eyes are black; wings and tail have a greeniſh ſhade.

Fuscus; Brown-headed Oriole. Black, head ruſty-brown; the tail is of a dirty-aſh colour. It is a gregarious bird, and is found in New York.

Niger; Black Oriole. This is totally black; but the female is greeniſh-brown; beneath and on the head inclining to cinereous. It inhabits North America; is about ten inches long; is gregarious, and in brooding time ſings delightfully, feeds on worms and beetles; builds in trees about eight feet from the ground, and lays five eggs, that are duſky, with black ſpots.

Minor; Leſſer Black Oriole. Black; head mixed with a little blue. The head of the female and the neck are of a duſky colour; wings and tail blueiſh.

Olivaceus; Cayenne Olive Oriole. Olive; head, chin, throat, and breaſt brown; wings black. It inhabits Cayenne, and is ſix inches long. The bill and legs are black.

Aoonalaschkensis; Aoonalaſhkan Oriole. This ſpecies is brown; ſpot under the eyes and chin white; the throat and breaſt are of a ruſty-brown; bill and legs brown. It is about eight inches long, and inhabits the iſland Aoonalaſcha.

Caudacutus; Sharp-tail Oriole. Variegated; tail-feathers ſharp-pointed. It inhabits New York; the ſize of a lark.

Sinensis; Kink Oriole. White; head, neck, breaſt, and upper part of the back cinereous; quill-feather ſteel-blue; tail rounded, half of it is white, and half ſteel-blue. It inhabits China, and is about ſix inches and a half long.

Aureus; Tawny-yellow Oriole. This, as its trivial name imports, is of a tawny-yellow colour; frontlet, chin, primary tail-coverts and feathers black at the extremity; the bill is brown. It inhabits India; and is eight inches long.

Viridens; Whiſtling Oriole. Olive, beneath inclining to green; tips of the wings and lower coverts yellow, the upper

upper and greater brown, edged with yellow; tail rounded. The bill is corneous; legs and claws grey.

Furcatus; Fork-tailed Oriole. Black; back, rump, quill-feathers and forked tail inclining to blue, lower tail-coverts white. Bill yellow; tail long; legs and claws black. It inhabits St. Domingo; and is about ſeven inches long.

Chrysocephalus; Gold-headed Oriole. Black; cap, wing, and tail-coverts pale-yellow. The hind-head and thighs golden; bill black; legs and claws black-brown. It inhabits America, and is above eight inches long, but in bulk it is about the ſize of a lark.

ORION, in *Aſtronomy*, one of the brighteſt conſtellations of the ſouthern hemiſphere: and as it occupies a large ſpace there, this circumſtance may probably have given the ancients, and particularly Pindar, occaſion to ſay that Orion was a perſon of a monſtrouſly large ſize, which Manilius expreſſes in theſe words: "magni pars maxima cœli." Nothing was more noted among the ancients than this conſtellation. It is mentioned in ſeveral paſſages of the Bible, *viz.* Job, ix. 9. Ezek. xiii. 10. Amos, v. 5. And both the Septuagint and the Vulgate call it Orion, as well as the Greeks.

The word is formed from the Greek ὀρεῖν, *to make water*; the ancients ſuppoſing, that it raiſed tempeſts at its riſing and ſetting.

The ſtars in the conſtellation Orion, in Ptolemy's catalogue, are thirty-eight; in Tycho's and Hevelius's, ſixty-two; in the Britannic catalogue, ſeventy-eight. See Constellation.

Orion, in *Mythology*, furniſhes a fable that is the moſt celebrated, and at the ſame time moſt obſcure in antiquity. The birth of Orion exhibits a myſtery equally indecent and difficult to be underſtood. As Jupiter, it is ſaid, Neptune, and Mercury were travelling on the earth, they lodged with Hyrieus, erroneouſly named Byrſeus in Hyginus, and were ſo pleaſed with their entertainment, that they aſked him what was the chief object of his wiſhes, promiſing to beſtow it upon him. Hyrieus anſwered, that having no children, theſe were what he chiefly deſired; and ſoon after Orion was born in the manner related by Hyginus: "Mercurius," ſays he, "de tauro quem Hercules immolaret, corium pertulit. Illi (*i. e.* Jupiter, Neptune, and Mercury) in eum urinam fecerunt, et in terram obruerunt, unde natus eſt Orion;" and hence he obtained the name of Ourion, or Arion. Afterwards, to obliterate the memory of his birth, the firſt letter of his name was changed, and he was called Orion, which Ovid thus expreſſes:

"Perdidit antiquum litera prima ſonum."

Homer, who mentions Orion repeatedly, ſays nothing of the fable of his birth, which probably was not invented in his time. It is certain that Orion ſignalized himſelf by his attachment to the ſcience of aſtronomy, which he had learned from Atlas, who, according to Homer, dwelt in the vicinity of Tanagrus, upon a high mountain, from whence he ſtudied the heavens, or in the iſland of Calypſo, his daughter. Moreover, Orion was paſſionately fond of hunting; and this circumſtance was the foundation of the connection of his hiſtory with that of Diana. Homer is the firſt who attributes Orion's death to the jealouſy of Diana:

"So when Aurora fought Orion's love,
Her joys diſturb'd your bliſsful hours above,
Till in Ortygia, Dian's winged dart
Had pierc'd the hapleſs hunter to the heart."
Pope's Odyſſ. v. 155.

Pauſanias ſays, that Orion's tomb was to be ſeen at Tanagrus in Bœotia; but this was probably merely a cenotaph; ſince he was actually interred in Delos, called Ortygia.

The circumſtance of the three divinities, who are ſaid to have lodged with Orion's father, led our Hebraizers to believe, that this fable was the ſame with, or at leaſt a copy of, the ſtory of Abraham's entertaining the three angels, who came and foretold to him the birth of a ſon, though Sarah his wife was then ſuperannuated. M. le Clerc (Bibl. Univ. t. vi.) had this notion of it, without inſiſting, however, upon the Greek and Hebrew etymologies, which might have given ſome probability to this aſſertion. Blaeu, who took the name of Cœſius (Cœl. Poet. Aſtr. Art. of Orion) inſinuates, that this fame fable had a great reſemblance to the ſtory of Jacob, ſo much the more as the name of Jacob's ſtaff is given to the three brighteſt ſtars in the conſtellation of Orion; and the name of Jacob, which ſignifies "ſtrong againſt the Lord," upon account of the myſterious combat he had with an angel, may have given riſe to it. Beſides, the Arabians call the conſtellation of Orion, "Algebar," or "Algebao," the ſtrong, the giant. The Abbé Fourmont has alſo argued that this ſtory is the ſame with that of the venerable patriarch. In favour of this ſentiment, the authors have to allege, that Orion, being of Tanagrus, a city of Bœotia, the country where Cadmus ſettled, and having there introduced the religion of the Phœnicians, the hiſtory of Abraham, ſo celebrated in all the Eaſt, might have been known there.

Orion's *River*, in *Aſtronomy*, a conſtellation, called alſo *Eridanus*; which ſee.

ORIPAA, in *Geography*, a town of Sweden, in the government of Abo; 27 miles N.N.E. of Abo.

Oris Columna. See Columna.

Oris *Diſtortor*. See Distortor.

Oris *Speculum*. See Speculum.

ORISICCHIO, in *Biography*, an eminent compoſer for the church, at Rome, in 1770. He then ranked ſo high for the elegance, as well as ſcience, of his eccleſiaſtical compoſitions, in Pergoleſi's ſtyle, that upon any feſtival, wherever he was maeſtro di cappella, and had compoſed a maſs, there was ſure to be a great crowd.

ORISSA, in *Geography*, a province of Hindooſtan, bounded on the north by Bahar and Bengal, on the eaſt by the northern circars and the bay of Bengal, on the ſouth by Golconda, and on the weſt by Berar. It was formerly a kingdom, till reduced by Akbar in 1592, and extended from the bay of Bengal to the coaſt of Coromandel; but it is not now ſo extenſive. Under Aurungzebe, it yielded a revenue of 36 lacks of rupees. The ſoil is flat, moiſt, and fertile, and the heat exceſſive. Oriſſa is nominally one of the Britiſh provinces, though only a ſmall part of it is ſubject to the Bengal government. The diſtricts of Midnapour are poſſeſſed by the Britiſh nation; the remainder being in the hands of the Mahrattas, and their tributaries.

ORISTAGNI, or Oristano, a town of the iſland of Sardinia, ſituated on the weſt coaſt, on a gulf to which it gives name; the ſee of an archbiſhop; fortified, but thinly inhabited; 38 miles N.W. of Cagliari. N. lat. 39° 48′. E. long. 8° 50′.

ORISTAL, a river of Mexico, which runs into the bay of Honduras, N. lat. 15° 48′. W. long. 86° 35′.

ORITES, in *Botany*, ὀρεῖτης, *inhabiting hilly places*, Brown Tr. of Linn. Soc. v. 10. 189. Prodr. Nov. Holl. v. 1. 387.—Claſs and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceæ*, Juſſ.

Eſſ. Ch. Petals four, equal, recurved at the ſummit. Stamens inſerted above the middle of the petals, prominent.

Nectariferous glands four. Germen ſeſſile. Style ſtraight. Stigma obtuſe, vertical. Follicle leathery. Seeds two, winged at the top.

1. O. *diverſifolia.*—Leaves flat, lanceolate, toothed or entire, ſlightly downy beneath. Suture of the follicle abrupt.—Native of the higheſt mountains of Van Diemen's land.

2. O. *revoluta.*—Leaves revolute, linear, entire; clothed with hoary down beneath. Suture of the follicle rounded.—Found in the ſame country.

Theſe are ſhrubs, with alternate *leaves*, which are either entire or toothed. *Spikes* axillary or terminal, ſhort, compoſed of pairs of hermaphrodite *flowers*, each pair accompanied by one *bractea*. *Brown.*

ORITES, in *Natural Hiſtory*, the name of a ſtone deſcribed by the ancients, and celebrated by the writers of the middle ages for its wonderful virtues. Pliny ſays, that it was round, and remained unhurt in the fire, and that ſome called it *ſideritis*. To this the later writers have added, that there are three kinds of it: the firſt round and black; this, rubbed over with oil of roſes, was famous for the bites of venomous beaſts. The ſecond was green, variegated with veins and ſpots of white; this was to be annexed to the bodies of perſons, to preſerve them from many ſorts of injuries. And the third was compoſed of parallel plates, and ſaid to have the virtue of cauſing abortion, if only carried in the pocket.

ORITORIUS LAPIS, a name given by Ludovicus Dulcis, and ſome other authors, to the *ochreoferreous ætitæ*, or eagle ſtones; particularly to a ſpecies of them common in Germany, and uſed in the ſhops there, and in ſome other places, under the name of eagle ſtones. Theſe are of a browniſh colour and ſmooth ſurface, and are eaſily broken, being only compoſed of a thin cruſt of ferruginous earth, encloſing ſeveral ſmall lumps of a greeniſh marle, which rattle in it when ſhaken.

ORIXA, in *Botany*, a genus of Thunberg's, whoſe name is of uncertain derivation. Schreber, on the authority of Dahl, ſuggeſts that it may poſſibly be the ſame plant as Thunberg's *Othera*. Thunb. Nov. Gen. 56. Fl. Japon. 3. Schreb. 82. App. 820. Willd. Sp. Pl. v. 1. 672. Juſſ. 425.—Claſs and order, *Tetrandria Monogynia*. Nat. Ord. uncertain.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, four-cleft, very ſhort. *Cor.* Petals four, lanceolate, ſpreading. *Stam.* Filaments four, ſhorter than the petals; anthers globoſe. *Piſt.* Germen ſuperior; ſtyle erect, ſhorter than the petals; ſtigma capitate, obtuſe. *Peric.* unknown, but moſt probably a capſule.

Eſſ. Ch. Petals four, lanceolate, flat. Calyx four-cleft. Stigma capitate. Capſule?

1. O. *japonica.* Linn. Syſt. Veg. ed. 14. 158. Thunb. Fl. Japon. 61.—Native of Japan. *Stem* ſhrubby, about ſix feet high, ſmooth, erect, branched. *Branches* alternate, ſmooth, the extreme ones hairy. *Leaves* alternate, ſtalked, ovate, undivided, green above, paler beneath. *Flowers* in alternate, greeniſh cluſters, an inch long. *Bracteas* concave, oblong, ſmooth, under the partial flower-ſtalks, which are hairy as well as the common ſtalk.

ORIZAVA, or ORISABA, in *Geography*, a town of Mexico, in the province of Tlaſcala, ſituated in a fertile valley, ſurrounded with detached mountains, overſhadowed with the moſt verdant foreſts, containing a population of 3000 whites, and 1500 Indians and Negroes. The town is about 1500 fathoms in length, and 500 in breadth, with wide, neat, and well paved ſtreets. Great quantities of tobacco are produced in the vicinity. It has ſome tanneries and manufactures of cloth; 55 miles S.E. of Puebla de los Angelos. Orizava is on the high road between Vera Cruz and Mexico, being, according to Alcedo, 46 leagues to the eaſt of the capital. In its vicinity is a volcano, which is regarded as the moſt majeſtic in the vice-royalty. D'Auteroche obſerves, that the mountain Orizava is ſaid to be the higheſt in Mexico; and its ſnowy capital is viſible from the capital, a diſtance of 60 miles. This celebrated mountain is to the ſouth-eaſt of Mexico, not far from the road to Vera Cruz. It became volcanic in 1545, and continued for 20 years; ſince which time there has been no appearance of inflammation. Although the ſummit be clothed with perpetual ſnow, the ſides are adorned with beautiful foreſts of cedars, pines, and other trees. Clavigero notices its conic form, which is obſerved at ſea at the diſtance of 50 leagues. Some think it higher than the peak of Teneriffe. The detached mountains, called by the Mexicans Popacatepec and Iztaccihuatl, are alſo to the ſouth-eaſt of the capital, at the diſtance of about 30 miles, and are both volcanic. The crater of the former is ſaid to be half a mile wide, and celebrated for ancient eruptions. Both are covered with perpetual ſnow.

ORIZEUS COLOR, a term uſed by authors to expreſs the yellow colour of the eyes and urine of perſons afflicted with a jaundice.

ORKEDAL, in *Geography*, a town of Norway, in the province of Drontheim; 18 miles S.W. of Drontheim.

ORKEL, a river of Norway, in the province of Drontheim, which runs into the bay of this name; 14 miles S.W. of Drontheim.

ORKENUD, a town of Sweden, in the province of Schonen; 24 miles N. of Chriſtianſtadt.

ORKIANI, a town of Curdiſtan; 36 miles E.N.E. of Erbil.

ORKNEY BEANS, in *Natural Hiſtory*, a name given by authors to a ſort of fruit found on the ſhores of the Orkney iſlands near Scotland. Theſe are of ſeveral diſtinct ſpecies, and are none of them the produce of thoſe iſlands, nor of any places thereabout, but are probably of American origin, many of them being plainly natives of Jamaica.

They are found principally on thoſe coaſts which are moſt expoſed to the waves of the great ocean, and are on theſe ſo plentiful, that they might be gathered in large quantities, if of any value; but the only uſe they are put to, is to making of ſnuff-boxes out of them. Sir Robert Sibbald, and Mr. Wallace, in their accounts of Scotland, have both named them under the title of Molucca beans.

ORKNEY, or *Orknay Iſlands*, in *Geography*, a cluſter of iſlands, ſituated in the northern ocean, between the coaſt of Caithneſs, the moſt northerly county of the main-land of Great Britain, and the Shetland iſles, are diſtant from the former about four, and from the latter nearly twenty leagues. The latitude of the chief town, Kirkwall, is computed to be 59° 9′ N., and the longitude 2° 30′ W. from the meridian of Greenwich. From the force of the ocean, their form, as may be ſuppoſed, is extremely irregular. Their ſize alſo varies greatly; ſome of them being mere iſolated rocks, incapable of human habitation; while others are ſeveral miles in circumference. Pomona, or the Mainland, extends above 30 miles in length from eaſt to weſt, and diſcovers, throughout that ſpace, a conſiderable degree of diverſity in point of appearance, ſoil, culture, and elevation.

According to the moſt accurate ſurveys, the whole iſlands, compoſing this intereſting group, are ſixty-ſeven in number; twenty-eight of which are inhabited. The remaining thirty-nine are denominated holms, and are appropriated to paſturage, during the ſummer months. The names of the inhabited

inhabited iſlands are Pomona or the Mainland, Graemſay, Hoy, Waas, Ruſſay or Riſſay, Farray, Cavay, Flotay, South Ronaldſay, Swannay or Swinna, Pentland, Skerry, Burray, Lamon or Lambholm, Copinſay, Shapinſay, Stronſay, Papay-Stronſay, Eday, Faray, Sanday, North Ronaldſay, Weſtray, Papay-Weſtray, Eagleſhay, Rouſay, Weir, Enhallow, Gainſay, and Damſay. The chief of theſe will be found deſcribed under their reſpective appellations, in preceding or ſubſequent pages of this work.

*Hiſtory.*—The period at which the Orkney iſlands were firſt made known to the civilized world is not recorded in the works of any ancient author. Dr. Barry, however, deems it more than probable that they were diſcovered by the Carthaginians, or by the ſpirited Greek colony at Marſeilles, ſeveral centuries previous to the Chriſtian era. But whether they were inhabited at that time, is a queſtion which the ſame writer admits it to be impoſſible to determine; though he is of opinion that they were, and thinks it moſt likely that the original inhabitants came hither from the north of Scotland. At all events, there is no doubt of their having been known to the later Greeks, and to the Romans. Herodotus mentions Britain in general. Diodorus Siculus takes notice of Scotland in particular, mentioning cape Orcus, or Dunnet, the moſt northern promontory of Caithneſs, from which theſe iſlands can be diſtinctly ſeen; and Pomponius Mela points them out under the name of Orcades, which is to this day their Latin appellation. Buchanan and ſome other authors mention the names of ſeveral kings, who reigned over theſe iſlands during the firſt five centuries of the Chriſtian era. And in the diviſion of the Roman empire among the ſons of Conſtantine, the Orcades are claſſed with Britain, Gaul, and Spain, in the enumeration of thoſe countries which fell to the lot of young Conſtantine.

Theſe circumſtances tend ſtrongly to ſhew that the Orkneys were formerly conſidered as an ancient kingdom; but of their hiſtory throughout this period, nothing can be affirmed with certainty, except that they were inhabited by the ſame race of people, who, under the denomination of Picts, occupied the whole eaſtern coaſt of Scotland, forming two diſtinct monarchies, ſeparated from each other by the Grampian hills. To the more northern of theſe ſovereignties the iſlands were tributary, in the eighth and ninth centuries. Towards the cloſe of the latter, however, they were reduced under the dominion of Norway, by Harold Harfager, who likewiſe ſubdued the weſtern iſlands and the Iſle of Man. This prince conferred the hereditary government of his new conqueſts on Ronald, count of Merca; but that nobleman immediately reſigned them in favour of his brother Sigurd, whom the king, at the ſame time, created earl of Orkney.

By the nature of this grant, Sigurd, though tributary to the king of Norway, was in effect as independent as any ſovereign prince, and could levy troops and make war at his own pleaſure. Accordingly he turned his arms againſt Scotland, and reduced under his ſway the whole of Caithneſs and Sutherland. This earl was ſucceeded by his ſon Gottorm, who dying without iſſue, the earldom reverted to his uncle Ronald, by whom it was given to Hallad, one of his own ſons. His government was marked with timidity and weakneſs. Inſtead of exerting himſelf to repel the inroads of the numerous pirates who infeſted the iſlands, he ſhut himſelf up in one of his caſtles, and at length abdicated the government, and returned to Norway. Einar, his brother, now obtained the earldom. The adminiſtration of this earl was as vigorous and wiſe as that of his predeceſſor had been weak and impolitic. He introduced many improvements into the iſlands, and not only freed them from piratical invaſion, but, throwing off the Norwegian yoke, on account of the murder of his father, rendered himſelf independent of that kingdom. Sigurd left three ſons, the two eldeſt of whom were ſlain in battle, ſhortly after their father's death; ſo that the earldom devolved upon Thorfin, the youngeſt. This earl lived in peace during his whole life; but after his death, the iſlands were diſtracted by the contentions of his ſons. At length the death of the others gave the undiſputed poſſeſſion of the earldom to Landver, who married the celebrated Audna, daughter of Kiawala, one of the kings of Ireland. By this princeſs he had one ſon, Sigurd, his ſucceſſor, who was one of the moſt illuſtrious men of his age. He fell in battle at Clontarf, near Dublin, and was eventually ſucceeded by his youngeſt ſon Morfin, who maintained the glory of his father's name. He left two ſons, Paul and Erlend, who lived in the utmoſt cordiality, till their friendſhip was diſturbed by the ambition of Hacon, the ſon of Paul. This young nobleman went over to Norway, where, as well as in Sweden, he acquired great military reputation. During his reſidence in the former country, he repreſented to king Magnus the advantages which would accrue from a weſtern expedition. That prince accordingly ſailed for Orkney, and diſpoſſeſſing the two earls, appointed one of his own ſons viceroy in their ſtead. He then made excurſions into Scotland, Ireland, and England, accompanied by Hacon, and his two couſins, Erlend and Magnus. This laſt was highly diſtinguiſhed for his learning and piety, which ſo much excited the envy of Hacon, that he cauſed him to be murdered. Soon after he obtained the earldom. Hacon had two ſons, Paul the Silent and Harold the Orator. The latter ſucceeded in Caithneſs, and the Orkneys were governed by Paul, till the deceaſe of the former, by his own imprudence, gave the entire ſovereignty to Paul. Another competitor for the earldom, however, ſoon after appeared. This was Ronald, the nephew of the murdered Magnus, who, after a long ſtruggle, ſucceeded in obtaining poſſeſſion of the iſlands, and built the noble cathedral of St. Magnus, his uncle having been previouſly canonized by the pope. But Ronald did not long continue ſole maſter of the iſlands, being induced by motives both of policy and juſtice to take young Harold, the heir of Paul, as a partner in the earldom. Theſe noblemen lived amicably together, but found great difficulty in maintaining their poſſeſſions againſt other pretenders. At length, however, Harold, who ſurvived Ronald many years, rendered himſelf ſo powerful, as to be able to levy war againſt the king of Scotland, and to wreſt Caithneſs once more from that monarchy. Harold died in the 73d year of his age, and with him ended the independent ſovereignty of the Orkneys; for though ſeveral earls of the Norwegian race governed after him, they were completely under the controul of the ſovereigns of Norway.

The laſt reſident earl of Orkney was Magnus V., at whoſe death, in 1379, the male line became extinct, and Henry Sinclair of the family of Strathearn, a deſcendant by the female line, ſucceeded to the title. Caithneſs and Sutherland were now alienated for ever to the crown of Scotland; and the kings of that country ſoon after claimed the ſovereignty of the iſlands alſo. This, however, they did not obtain till the reign of James III., who having married a daughter of Eric, king of Denmark, Orkney and Shetland were pledged in payment of her dowry, which was never paid; and conſequently both theſe cluſters of iſlands have, ſince that period, formed a part of the Scottiſh monarchy, and followed its deſtiny. The earls, however, retained for ſome time longer many of the high privileges annexed to their ſtation; but theſe alſo, and even the title,

were eventually renounced, in exchange for other poſſeſſions and honours. Queen Mary attempted to confer theſe iſlands, with the title of duke, on her favourite the earl of Bothwell, when ſhe intended to marry him. James VI. gave them to Patrick Stewart, at whoſe attainder they again reverted to the crown, and were afterwards granted to the earl of Morton. In this family they continued till the year 1766, at which time they were ſold to the father of their preſent proprietor, lord Dundas.

*Geology and Mineralogy.*—The eaſtern coaſt of the iſlands is low, and generally flat. As the ſhore advances to the weſt, the land is ſo elevated, as, with a few interruptions, to form itſelf into a range of hills, the higheſt of which is about 1200 feet in perpendicular height from the ſurface of the ſea. The ſhores in this quarter are bold and ſteep, and preſent many ſcenes truly ſublime. In ſome places they remain entire; but in others, having yielded to the force of the ocean, and the ravages of time, they appear ſhattered into a thouſand pieces, formed into majeſtic arches, or hollowed out into dark and unfathomable caverns. From the diſpoſition of the ſtrata, and many other conſiderations, little doubt can be entertained but that theſe iſlands, in remote times, were connected with each other, and alſo with the main-land of Scotland.

Both in the iſlands to the north of Pomona, and in thoſe ſouth from it, the ſtrata conſiſt chiefly of ſand-ſtone, ſand-ſtone flag, ſchiſtoſe, clay, and lime-ſtone, together with ſome mixture of baſalt and breccia. The ſand-ſtone, which is very plentiful, is in ſome places red, and in others of a dirty grey colour. The lime-ſtone and baſalt generally lie under a ſtratum of ſand-ſtone; and ſo little metallic ore does this group afford, that almoſt the only veins of any conſequence, hitherto diſcovered, are two of lead in the iſland of Shapinſay, and ſome iron-ſtone in Hoy. The ſtrata of the main-land are ſimilar to thoſe in the other iſlands; but it likewiſe contains ſome ſlate, granite, marble, and alabaſter, and is more abundantly ſupplied with metallic ores. A large rock, of rather ſingular character, ſtands at the weſtern entrance of the Pentland frith. The ground of this rock is of various colours; brown, red, grey, white, yellow, and greeniſh. Small rounded pebbles, generally quartz, of a white colour, are diſſeminated through it; and fragments of granite and other ſtones are immerſed in it, in various places. Veins and detached nodules of white calcareous ſpar are likewiſe frequent. In ſome parts it is rudely ſtratified, but in general is a ſhapeleſs maſs or blotch. Being ſuſceptible of a fine poliſh, cups, vaſes, and ornamental trinkets, are formed from it.

*Soil and Climate.*—The ſoil of the Orkney iſlands is more various, probably, than in any other diſtrict of Great Britain; and theſe varieties are ſo intermixed, that ſcarcely a ſingle farm is in this reſpect uniform. All the ſoils are thin or ſhallow, being ſeldom more than one or two feet deep; but they are nevertheleſs uncommonly fertile. The rocks upon which the ſoil reſts, and which in many places are ſo ſoft and friable as to break before the plough, appear by their decompoſition to prove favourable to vegetation, or to afford food for plants.

Though ſituated ſo much to the north, the climate of theſe iſlands is not liable to thoſe extremes of heat and cold, which prevail in continental countries, leſs diſtant from the equator. This fact is the reſult of the proximity of every part of them to the ocean. The medium temperature, as appears by the ſprings, amounts to 45°; and the whole range, between the loweſt point of cold in winter and the higheſt of heat in ſummer, is from 25 to 75° of Fahrenheit's thermometer. The moſt prevalent winds here blow from the ſouth-weſt and ſouth-eaſt, in the ſpring, ſummer, and harveſt months; but during the reſt of the year, northerly winds are moſt frequent. Calms ſeldom occur for any length of time; and the winds, from whatever quarter they blow, or in whatever ſeaſon, are ſcarcely ever tempeſtuous, though often loud and ſtrong; a circumſtance which contributes greatly to the ſalubrity of the atmoſphere. Rains fall here in conſiderable quantity, and more on the weſtern than on the eaſtern coaſt. Snows are neither frequent nor of long duration; but they come with uncommon violence, and generally from the north-weſt and ſouth-eaſt quarter of the heavens. One peculiarity with reſpect to this ſubject is, that ſnow and hail are very prevalent for about a fortnight in the month of June. They are accompanied by a ſtrong piercing wind from the north, which, deſtroying the buds and their bloſſoms, checks the progreſs of vegetation, and clothes the fields with the appearance of approaching winter. The cauſe of this extreme and ſeemingly unnatural cold is the diſſolving of the immenſe fields of ice, in the northern ocean, happening at this ſeaſon, and the conſequent abſorption of heat, occaſioned by the change of that body from the ſolid to the fluid ſtate. About 50 years ago, the inhabitants were thrown into great alarm, by the fall of what was termed black ſnow, during this period. The phenomenon, however, was ſoon afterwards explained, and their fears allayed, by an account of an eruption of mount Hecla, in Iceland, having taken place on the day previous, which no doubt was the ſource whence the ſnow derived its unuſual hue. Thoſe who may be inclined to doubt this view of the fact, on account of the diſtance, will do well to conſult Buffon (Natural Hiſtory), who diſtinctly ſtates, that in ſome of the eruptions of mount Ætna, or Veſuvius, the aſhes have been carried by the winds to the ſhores of Egypt.

Another ſtriking peculiarity in the climate of theſe iſlands is, that thunder and lightning, the uſual concomitants of hot and ſultry weather, are ſeldom obſerved here in ſummer; but, in direct contradiction to the apparently general law of nature, are common in winter, and then only when the elements are in commotion. To what cauſe this anomaly ought properly to be referred, is yet a queſtion of uncertainty among natural philoſophers. Experience, however, has ſufficiently teſtified that their appearance in the cold ſeaſon has no effect in rendering them either more violent or deſtructive than in other parts of the globe. They are not accompanied by hail-ſtones of ſuch magnitude, nor have they ſuch a tremendous glare, nor ſuch loud and awful peals, as in more ſouthern climates.

From the proximity of theſe iſlands to the north pole, the days here in ſummer are of extreme length, but thoſe of winter are ſhort in proportion. The long abſence of the ſun, however, throughout this ſeaſon, is in ſome meaſure compenſated by the great luſtre of the moon, during her periods of ſhining, and by the ſcarcely leſs tranſcendent brilliancy of the aurora-borealis, which ariſes almoſt every unclouded night in the harveſt, winter, and ſpring months, and is of incalculable advantage to the navigation of thoſe ſeas, which are perilous only when want of light renders it impoſſible for the ſeamen to aſcertain the poſition of their numerous rocks, or to enter one of the excellent harbours with which almoſt every iſland abounds. For ſome account of this phenomenon, ſee AURORA-*Borealis*.

*Tenure of Lands.*—Landed property in Orkney is held in a variety of forms, which may, however, be generally reduced to three: crown-lands, church-lands, and udal-lands. The firſt were anciently the private property of the earls, but came in the courſe of time to be feued out, or granted

in perpetuity to vaſſals, who are bound to pay for ever the old rents. The church-lands are thoſe which formerly belonged to the biſhops and clergy, and which are now held by individuals, whoſe anceſtors had obtained them in feu or perpetuity, for payment in kind of the original rents. The udal-lands are thoſe poſſeſſed without any written charters. This tenure occurs alſo in Shetland, and in the town of Lochmaben. Hence it would appear that the feudal ſyſtem had never fully penetrated to theſe iſlands. The udallers, however, are comparatively few in number: ſome of them pay a trifling rent to the crown or church, but many pay to neither. Several of the larger, and many of the ſmaller, proprietors cultivate their own grounds; but the far greater proportion of the lands is let out to tenants; the larger farms on leaſes of ſeven, fourteen, or nineteen years, and the leſſer ones uſually at will. The ſize of farms in tillage varies from two acres to two hundred: an average ſize may be about eight acres in cultivation to each farm.

*Agriculture.*—The great irregularity of form diſcernible in theſe iſlands renders it almoſt impoſſible to compute the number of ſquare miles, or of acres they may contain. An attempt to effect this object has been made, however, by Templeman; according to whom, the whole group compriſes 384,000 Engliſh acres, of which only 24,000 are arable, and 60,000 laid down in paſture. The remainder is occupied by heath, and moſs, and by houſes, walls, roads, water, &c.

The uſual grains cultivated in the Orkneys are grey oats and bigg or bear; and theſe in alternate crops, without intermiſſion. Fallowing is very ſparingly practiſed by the larger farmers, but not at all by the ſmaller ones. A few acres of turnips are ſown annually; and from the abundance of the produce, the ground and climate would ſeem to be peculiarly adapted to that crop. The manure in ordinary uſe is ſea-weed. Lime and marle, though ſufficiently abundant, and eaſy of acceſs, are ſcarcely ever uſed; and even the dung of animals is neglected, in compariſon of their favourite ſea-weed. Draining is a cuſtom totally unknown. In ſhort, neither the ſcience nor the practice of agriculture is yet underſtood in this part of the Britiſh empire; nor is it probable that much improvement will take place, ſo long as the payment of rents and duties is managed on the preſent ſyſtem. In a country ſo ſituated as the Orkneys, the farmer has obſtacles enough to combat of a phyſical nature, and requires more than ordinary incentives to vigorous exertion. To clog him, therefore, with civil burdens, is to extinguiſh every feeling of which induſtry is the reſult.

The inſtruments made uſe of here for agricultural purpoſes are lamentably deficient. The ſame plough, which was formerly univerſal, is ſtill common. It has only one ſtilt, without either wreſt or mould-board; and its other parts are joined in ſuch a form, that it does not poſſeſs a ſingle quality to recommend it but its ſimplicity, and the low price at which it can be purchaſed. This awkward tool is drawn by three or four ſmall horſes abreaſt, with the driver moving backwards before them. The harrows are very ſmall and light, and often have wooden teeth, even where the ſoil is ſtrongeſt. The roller is little known, being uſed only by a few of the great farmers. For ſome further remarks on the agriculture of theſe iſlands, ſee POMONA.

*Botany.*—To enumerate all the indigenous plants, which have been obſerved in the Orkneys, would far exceed the limits allotted to an article of this kind. Thoſe uſually raiſed for convenience, or ornament, differ little from ſuch as are met with in ſimilar ſituations, in other parts of Scotland. Bear or bigg and oats are the kinds of grain moſt commonly cultivated; but to theſe, though in very ſparing quantities, are ſometimes added peaſe, beans, wheat, rye, and flax, on the grounds of the more enterpriſing gentlemen farmers. The ſame deſcription of perſons likewiſe raiſe tares, ſaintfoin, lucern, cabbage, turnips, and different ſorts of clover and rye-graſs. In the flower-garden, the roſe, the tulip, the carnation, the pink, and a multitude of other flowers, are cultivated with ſucceſs; and the kitchen-garden produces cabbage, brocoli, cauliflower, peaſe, beans, ſpinnage, leeks, onions, turnips, carrots, parſnips, celery, and artichokes. The fruit-garden affords excellent black, white, and red currants: the other fruits, however, are very inferior both with reſpect to ſize and flavour. Of trees there are only a few in Hoy; and theſe, on account of their ſtunted growth, ſcarcely deſerve the name: and ſome of larger dimenſions in the gardens around Kirkwall. This fact would excite little ſurpriſe, if the moſt unequivocal evidence of their former exiſtence here, in great plenty, were not derived from hiſtory, and from the number of trunks dug up in the moſſes. The opinion ſo commonly entertained, that trees will not grow in the Orkneys, is completely erroneous. When proper attention is paid to the early growth of the young ſhoots, its fallacy will ſoon become manifeſt. The failure of the attempts hitherto made has been the conſequence of neglect, or of the want of judgment in planting in ſituations too much expoſed to the violence of the weather, or of the ſea ſpray.

*Zoology.*—The quadrupeds of theſe iſlands are the horſe, the ox, the ſheep, the hog, the dog, the cat, the otter, the ſhrew-mouſe, the role-mouſe, the field-mouſe, the Norwegian rat, the rabbit, and the ſeal. The horſe is preciſely ſimilar in appearance and qualities to that of Shetland. (See MAINLAND *of* SHETLAND.) The ox is of a very ſingular breed, and altogether different from any kind known in other parts of Great Britain. This animal is of a very diminutive ſize, but ſtrong and hardy; and is ſuppoſed to have originally come from the Scandinavian ſhores. The ſheep is likewiſe a peculiar breed, and, from ſome features in its character, appears to be ſprung from the ſame ſtock with that of Iceland, the Ferroes, and Shetland. It is reared entirely in a wild ſtate, and hence is extremely ſmall; the whole carcaſs ſeldom weighing more than 36 pounds. The hog is very different from the ordinary ſpecies bred in Scotland. Its back is highly arched, and covered with a great quantity of long, ſtiff briſtles; the ears erect and ſharp pointed, and the noſe amazingly ſtrong. The hair of this animal is an article of conſiderable value: it ſerves as an excellent ſubſtitute for hemp, in making ropes to anchor fiſhing-boats.

The brown or Norwegian rat has been introduced by the ſhipping that frequents the iſlands, and has nearly baniſhed the common black rat. From the tip of the noſe to the point of the tail it meaſures about 18 inches. This animal diſplays great fierceneſs, and has even been known to brave the attack of man. Rabbits are ſo abundant here, that their ſkins form a conſiderable branch of commerce. Their colour is uſually brown; an entirely white one is ſeldom ſeen. Though devoured by various animals of prey, the ſtock never ſeems to ſuffer any diminution. The caſe, however, is very different with the hare, which was formerly an inhabitant of the Orkneys, but has entirely diſappeared within the laſt two centuries. Seals are common in all the ſmall iſlands, or holms, and are valuable for their ſkins and oil. Hams, made of young ſeals, are much reliſhed by the natives.

The domeſtic birds are dung-hill fowl, ducks, geeſe, turkeys, and a few peacocks. The wild birds conſiſt of an immenſe

immenſe variety of land and ſea-fowls, both migratory and indigenous. In ornithology, indeed, the Orkneys conſtitute the moſt intereſting diſtrict in the Britiſh iſles. It is the general breeding-place of our native water birds; and in the towering cliffs and precipices of many of the iſles are numbers of eagles, falcons, and owls. Swans alſo are abundant, during winter, in the freſh-water lakes. Mr. Bullock, the proprietor of the London Muſeum, has lately enriched his valuable collection by many beautiful and rare ſpecimens from theſe remote iſlands, where he ſpent a great part of the ſummer of 1812. In the awful cliff he found every ſpecies of Britiſh eagle, except the oſprey; and brought away ſeveral of the young birds, as well as thoſe of the peregrine falcon. The great northern diver frequents the bays of this iſle; and thoſe rare Britiſh birds, the red-throated diver and the arctic gull, breed on the edges of the freſh-water lakes. In North Ronaldſay the gentleman above mentioned diſcovered, and added to the Britiſh Fauna, the majeſtic ſtrix nyctea, or great ſnowy owl of Hudſon's Bay. In the marſhes of Sanda he found the neſt of the beautiful little red phalarope. The great black-backed gull breeds in the Souliſkerry, a low flat iſle ſituated 10 leagues from Hoy. Here were ſeen ſuch myriads of birds, that they darkened the air; and it was difficult to walk, without deſtroying their eggs In the ſmall holm of Papay-Weſtray were diſcovered the king-duck, the eider-duck, ſo valuable for its down, and the only ſpecimen of the great auk Mr. Bullock ever ſaw on the Britiſh ſhores. Grous are common in all the mountainous iſles, but partridges are unknown. The ſtormy petrel, or Mother Carey's chick, breeds in the rabbit-holes on ſeveral of the iſles. The peregrine is diſcovered on head-lands and inacceſſible precipices: never more than one pair and their offspring inhabit the ſame rock; and as ſoon as the young ones have acquired ſufficient ſtrength, they alſo are driven away by their parents to ſeek new places of habitation for themſelves. When falconry was in vogue, this noble kind of hawk was frequently carried hence for the amuſement of the Scottiſh monarchs. In ſuch eſtimation, indeed, was it held, that when the earldom was diſannexed from the crown by act of parliament, all hawks were reſerved to his majeſty, with the falconer's ſalaries; and accordingly, even at this day, a hen from every houſe here is paid annually to the royal falconer.

Among the eagles which abound in Orkney, the ſpecies called the ring-tail eagle is moſt remarkable. It is diſtinguiſhed from the other kinds, by a band of white encompaſſing the root of the tail, and by the feathers covering its legs to the very feet. This bird is ſo prodigiouſly ſtrong, that he has been known to carry off, not only large fowls, but lambs, pigs, and even children. So great was the devaſtation committed by him in ancient times, that a law was paſſed, aſſigning a conſiderable reward to any perſon who deſtroyed a neſt, or one of the birds. In the exhibition of the Royal Academy of London, 1813, was a very fine and intereſting picture, from the pencil of G. Dawe, A.R.A., repreſenting a mother reſcuing an infant child from the neſt of one of theſe eagles.

The dexterity of the natives in catching the various kinds of aquatic fowls is ſurpriſing, and the attempt is apparently fraught with the utmoſt danger. Sometimes an individual is lowered down by a rope, from the ſummit of a precipice, to the place where the birds neſtle. At other times, one party proceeds in a boat to the foot of a rock, while another is ſtationed on the top. Thoſe on the ſummit are provided with two ropes, which are thrown down to their comrades in the boat, who faſten them to the upper corners of a large net. The net is then hoiſted up, ſo as to cover the rock on which the birds are ſitting; and as ſoon as this has been effected, a noiſe is made with a rattle by the boatmen below. The fowls, terrified at the ſound, fly into the boſom of the net, in which they are inſtantly incloſed, and lowered down into the boat.

The marine animals, which haunt the coaſt of theſe iſlands, are no leſs various than the birds which frequent their rocks. Lobſters and crabs are diſcovered in great abundance. Of the former fiſh, many thouſands are ſhipped for the London market every week. The coal, cod-fiſh, and haddock, are plentiful, and ſo likewiſe are herrings; but notwithſtanding the great advantage which might accrue from theſe fiſheries, very little attention is paid to this ſpecies of induſtry. Skates are found here from one to five feet in diameter. The grampus is ſeen in great numbers in moſt of theſe coaſts, and particularly in ſtrong and impetuous currents. The ſize of theſe animals is from fifteen to twenty-five feet in length, and they are very thick in proportion. Its appetite is ſo voracious, and its nature ſo fierce, that it will attack the largeſt fiſhes. The ſpermaceti whale, the bottle-noſe, and the round-lipped whale, are very frequently thrown on ſhore in theſe iſlands; a circumſtance ſuppoſed to be occaſioned by the attacks of the grampus. Herds of porpoiſes to the amount of a hundred and upwards are often ſeen together.

*Natural Curioſities.*—Among the curioſities of Orkney, the ſtupendous arches, and immenſe caverns formed by the ocean, are the moſt prominent, and cannot fail to attract the notice and excite the ſurpriſe of all who are ſtrangers to ſuch ſcenes. The Old-man-of-Hoy is probably as remarkable a monument of its kind as any in the univerſe. It riſes boldly from the ſea to the height of 1500 feet, and exhibits a perpendicular ſection of the ſand-ſtone ſtrata, built upon each other with all the regularity of architecture. In ſome aſpects it reſembles a rude pyramid, whoſe baſe has been narrowed by the waves; in others, it bears a ſtriking ſimilitude to the ruins of a vaſt cathedral, or of a turreted caſtle. Near the ſummit of this hill, in the ſummer months, ſomething is obſerved to ſhine and ſparkle with uncommon luſtre. The natives regard it as an enchanted carbuncle; and it is curious, that, though many perſons have clambered up the rock to aſcertain the occaſion of this appearance, they have hitherto failed in their object.

On the ſhores here are found a great number and variety of curious marine ſhells, and many ſtrange fiſhes, driven hither by the currents of the ocean. But the greateſt curioſity thrown by the ſea on theſe iſlands are the phaſeoli, commonly known by the name of the Molucca or Orkney beans. They are of ſeveral ſpecies, none of which are the produce of a northern climate, but are probably of American or Weſt Indian origin; many of them being natives of Jamaica. They are found chiefly on the weſtern coaſts, and are on theſe ſo plentiful, that they might be gathered in large quantities, if of any value; but the only uſe they are adopted for is the making of ſnuff-boxes. See ORKNEY *Beans*.

Exotic birds, the inhabitants of diſtant and warm climates, occaſionally viſit theſe iſlands; whither they have been doubtleſs forced by tempeſtuous weather. A Laplander, from the ſame cauſe, is ſometimes ſeen here, in his ſlender canoe, covered with ſkins. Fiſh, as large as whitings, are frequently thrown aſhore to a conſiderable diſtance within the land; and at Cantick Head, ſuch is the force of the meeting tides, that, in ſtormy weather, huge ſtones are often heaved up from the bowels of the deep, and caſt over the rocks upon the ſhore.

*Ancient and preſent State of Religion.*—Previous to the Norwegian

wegian invaſion, the inhabitants of Orkney appear to have been worſhippers of the ſun, and to have had Druids for their prieſts. That event, however, brought along with it the barbarous ſuperſtition of the north, or the worſhip of Odin. This god was ſuppoſed to delight in bloodſhed and war; and thoſe who fell in battle were deemed ſo many victims on his altars. Death in action was the ſureſt paſsport to his paradiſe, the pleaſures of which conſiſted of indulging in immortal drunkenneſs, accompanied with the triumph of victory, or of drinking ale to all eternity out of the ſkulls of an enemy.

To this horrid worſhip ſucceeded the milder doctrines of Chriſtianity, towards the end of the tenth century, when Sigurd was in poſſeſſion of the earldom. The manner in which its eſtabliſhment was effected affords a ſingular view of the manners of the age, and of the zeal with which that religion was propagated. Olaus Frigueſſon, who then filled the throne of Norway, having been converted while in England, and perceiving the ſuperior excellence of the Chriſtian creed and precepts, became inſpired with the moſt earneſt deſire of converting others. For this purpoſe, accordingly, he viſited Ireland; and on his return, brought his fleet to anchor in one of the harbours of South Ronaldſay, and ſent an invitation to Sigurd and his ſon to come on board his ſhip. The earl ſuſpecting no treachery, and confident in his acknowledged fame and power, inſtantly complied, imagining that the king wiſhed to hold a conference with him reſpecting ſome military enterpriſe. He was ſoon, however, undeceived, by Olaus telling him the object of his expedition, and declaring, that unleſs he and his people would immediately embrace the Chriſtian faith, he would deſolate his country, and put every heretic to death. Sigurd, though confounded at this unexpected threat, nevertheleſs anſwered with firmneſs, that he could not ſuffer himſelf to renounce his religion, ſanctioned as it was by the wiſdom of his anceſtors, until ſome ſufficient reaſons were offered why he ſhould be guilty of ſuch abjuration. The Norwegian monarch replied by ſeizing the ſon of the earl, and ſwearing he would plunge his ſword into his breaſt, if his father continued obſtinate: whereupon Sigurd agreed to his propoſals, and publicly profeſſed himſelf a Chriſtian. His example was followed ſhortly after by all the people; and, from that period, Chriſtianity conſtituted the religion of the Orkneys, which, with Shetland, ever after formed one biſhopric. Some of the prelates who filled this ſee were men diſtinguiſhed, not only as divines, but as eminent literary and political characters. Among the more celebrated of them were Robert Reid and Adam Bothwell. The former held ſome of the higheſt offices in Scotland, and was one of the commiſſioners ſent to witneſs the marriage of Mary, queen of Scots, with the dauphin of France. He left by will 8000 marks, for the purpoſe of founding a college in Edinburgh. Adam Bothwell, his ſucceſſor, was the firſt epiſcopal biſhop of the iſles. This prelate performed the marriage ceremony between queen Mary and Bothwell; and alſo inaugurated her ſon, king James, after ſhe was compelled to reſign her crown. By his aſſiſtance the Scotch laws were firſt collected into a body, and publiſhed; and when the unhappy differences occurred between the young king and his mother, during her impriſonment in England, he was choſen by the eſtates to aid the regent in bringing them to a termination.

So long as the Catholic and epiſcopal form of church government continued in theſe iſlands, eighteen ordinary officiating clergymen were ſtationed here. The ſame number was employed after the eſtabliſhment of preſbyterianiſm; moſt of whom had, as their ſucceſſors ſtill have, two or even three churches to occupy, frequently ſituated at conſiderable diſtances from each other, and ſeparated by branches of the ſea. Notwithſtanding this, however, divine ſervice is ſaid to be performed in all of them with becoming regularity. For ſome time ſubſequent to the change of religion, the whole clergy were united into one preſbytery; but they afterwards divided into two, and now form three preſbyteries, conſiſting of ſix miniſters each; the whole compoſing a provincial ſynod. The three preſbyteries chooſe each three members, and the borough one, to repreſent them in the general aſſembly. Lord Dundas is patron of all the pariſhes both of Orkney and of Shetland.

*Civil Government.*—Before the transfer of the Orkneys to the crown of Scotland, the inhabitants were governed by the laws, and adhered to the cuſtoms of Norway. Indeed, for a long period after they changed their maſters, theſe iſlands ſtill retained the ſame political conſtitution as before. The ſupreme court, called in the language of the country lawting, continued in the exerciſe of its legiſlative powers ſo late even as the time of the commonwealth, when it was entirely aboliſhed. The acts paſſed in this aſſembly, which are ſtill known under the name of county acts, are ſaid by Mr. Barry to diſcover much regard to the proſperity of the place, as police regulations, though lamentably defective on the ſubject of trade and commerce. The conſtitution of the lawting is ſuppoſed to have reſembled, in ſome degree, that of the tyndal-court, or houſe-of-keys, in the Iſle of Man. The preſident, or principal perſon of this court, was named the great foud, or lagman; and ſubordinate to him were ſeveral little fouds, or under-ſheriffs or bailiffs: and as the chief judge had a council, conſiſting of ſeveral members, called raddmen; ſo the inferior ones had their council alſo, compoſed of members denominated lagraetmen, or lawwrightmen, who were a kind of conſtables for the execution of juſtice in the reſpective iſlands. To theſe members were added, at leaſt latterly, the governors for the time, the gentlemen of the county, and even a certain number of the peaſantry, who, among a free people, claimed a vote in framing the laws that were to govern them.

The legiſlative enactments of the lawting have for many years totally fallen into diſuſe, and the deciſions of all the courts are now regulated by the principles and practice of the law of Scotland. Lord Dundas, as high ſteward or lord lieutenant of the county, which includes both the Orkney and the Shetland iſles, has the power of nominating certain judges called bailies, one of whom is eſtabliſhed in every iſland and pariſh. Theſe petty magiſtrates act as juſtices of the peace, and hold courts for the deciſion of civil pleas to the value of 16*s.* 8*d.* ſterling. All queſtions of higher import muſt be pleaded in the ſheriff's court, which is held at Kirkwall, uſually by the ſheriff-ſubſtitute; the ſheriff-depute, who is always a Scotch barriſter, and appointed by the crown, only viſiting his juriſdiction occaſionally, to determine ſuch cauſes as may chance to involve more difficult and abſtruſe points of law. Subſervient to the bailies are ſix or ſeven of the more reſpectable inhabitants, who act as conſtables, and ſuperintend the morals of the other pariſhioners. In Kirkwall, which is the ſeat of juſtice, there are, beſides the ſheriff's court, a commiſſary, a juſtice of the peace, and admiralty court. The commiſſary court is appropriated to pleas of an eccleſiaſtical nature, ſuch as divorces, marriages, &c. See SCOTLAND.

*Towns, Repreſentation, &c.*—The only towns or villages of any conſequence in the Orkney iſlands are Kirkwall and Stromneſs. Both theſe places are ſituated on the Mainland, and are ſuppoſed to contain nearly 3000 inhabitants each. The former is a royal burgh, and the capital of the county; but

but Stromneſs is merely a village, though it probably carries on more trade than Kirkwall. See KIRKWALL and STROMNESS.

The county is repreſented in the Britiſh parliament by one knight of the ſhire; and the burgh, in conjunction with four others, make choice of a burgeſs, who is likewiſe conſidered as the repreſentative of the inhabitants at large. Lord Dundas, as may be ſuppoſed, poſſeſſes the chief intereſt both in the county and burgh.

*Population.*—As there are no authentic data, by which the ancient population of theſe iſlands can be accurately aſcertained, the conjectures which have been hazarded on this ſubject afford very different reſults. When, however, the power of the earls, and the anxiety with which their alliance was courted, are taken into view, it ſeems reaſonable to conclude that it muſt have been very conſiderable. In a general muſter of the people by P. Stewart, earl of Orkney, it is ſaid that 10,000 men could be raiſed on any emergency, and as many left as were ſufficient for the agriculture and fiſheries. Guthrie, in his Hiſtory of Scotland, aſſerts that the ſame amount of perſons from this country carried arms, at the time of the great rebellion, in the 17th century. Theſe repreſentations, if admitted to be correct, would ſeem to ſwell the population beyond the bounds of probability. Dr. Barry, therefore, conſiders them as extravagant. It is certainly evident, however, that the population of the Orkneys has ſuffered a great decreaſe within the laſt century; and no leſs clear, that the iſlands are capable of ſupporting four times the amount of their preſent inhabitants, which, according to the parliamentary returns of 1811, were computed at 23,238 in number.

*Manufactures and Commerce.*—At the commencement of the laſt century, a very conſiderable manufacture of woollens is ſaid to have been carried on in theſe iſlands. This branch of induſtry is now much decreaſed, and confined entirely to a home conſumption. The articles manufactured are chiefly ſtockings and blankets, and a very coarſe kind of cloth worn by children, and by thoſe reſident in the country; for the inhabitants of the town almoſt univerſally wear Engliſh cloth. The linen manufacture was introduced about ſixty years ago; and though at firſt it met with an unfavourable reception, it ſoon triumphed over every oppoſition, and became very widely diffuſed, to the great benefit both of the manufacturers and of the labouring poor; many of whom muſt have periſhed for want, but for the timely ſupport it was the means of ſupplying. This improving condition of affairs continued for upwards of twenty years, when the manufacture ſuffered a temporary decline, by a competition among the manufacturers, occaſioning an undue riſe of wages, which ſeldom fails to be attended with a proportionate diminution of induſtry among an indolent people. The natural courſe of events has happily, however, corrected this evil; and the linen manufacture is now more extenſive, and better conducted, than at any former period. The quantity of linen cloth ſtamped annually exceeds 60,000 yards; and the amount of yarn ſold in the ſame ſpace, to the merchants of Newcaſtle, Edinburgh, and Glaſgow, and to itinerant purchaſers, is eſtimated at conſiderably above 100,000 ſpindles. Almoſt all the flax conſumed is imported from Ruſſia and Holland.

But the principal and moſt lucrative manufacture of the Orkney iſlands is that of *kelp*. This ſubſtance is chiefly valuable on account of the large quantity of ſoda it contains, which renders it uſeful in the compoſition of ſoap; in the manufacture of alum, and in the formation of crown and bottle glaſs; indeed in theſe manufactures kelp anſwers completely all the purpoſes of the very beſt potaſh. It is formed by burning certain ſpecies of marine plants; and affords employment to about three thouſand perſons of both ſexes during the ſummer months. Each of them makes in that period a ton, conſiſting of 24 cwt. of kelp, for which they receive, according to circumſtances, from 30*s.* to 3*l.*, ſo that the total quantity made every ſeaſon is ſomewhere about 3000 tons. The price at which it is ſold to dealers in the ſouth, varies from 8*l.* to 10*l. per* ton, including the expence of freights, inſurance, &c. which are moſtly effected by natives. Hence the profits accruing to the iſlands from this manufacture are calculated on an average at 25,000*l. per annum*. For ſome account of the proceſs of making kelp, ſee CARBONAT *of Soda*.

The Orkneys, from their ſituation, and from the excellence of their harbours, are certainly well calculated for a commercial connection, not only with the different trading towns of Great Britain, but with the north of Europe, and with America. Such a connection, however, cannot poſſibly ſubſiſt to any conſiderable extent, until an important amelioration of their agricultural and manufacturing condition takes place; and this, we fear, is not ſoon to be expected. Nevertheleſs, it is pleaſing to obſerve that the limited trade theſe iſlands poſſeſs is in a progreſſive ſtate of improvement. The principal exports are beef, pork, butter, tallow, hides, calf ſkins, rabbit ſkins, ſalt fiſh, feathers, linen, yarn, and coarſe linen cloth and kelp; and, in favourable ſeaſons, corn, meal, and malt. The imports are wood, iron, flax, coal, ſugar, ſpirits, wines, ſnuff, tobacco, flour, and biſcuit, ſoap, leather, hard ware, broad cloth, and printed linens, and cottons. In 1790 the exports were valued at 26,598*l.* 12*s* 0*d.* and the imports at 20,803*l.* 0*s.* 0*d.* prime coſt in the Engliſh and Scotch markets; but in 1800 the exports were ſtated at 39,677*l.* 9*s.* 4*d.* and the imports at 35,789*l.* 17*s.* 4*d.*

*Obſtacles to Improvement, Weights, &c.*—The chief obſtacle to the improvement and value of theſe iſlands, is the neceſſity the farmers are under of paying their rents in kind, and principally in grain. Hence it ariſes that the latter produce muſt either be raiſed on grounds which are far better adapted for the cultivation of graſs or green crops, than of corn; or the farmer muſt commute at a rate which renders his rent extravagant, and ſuch as wholly precludes him from realizing a reaſonable profit for his labour. This rate is the price brought by the beſt foreign grain, loaded as it is with freight charges and mercantile emoluments. To remedy this ſerious evil, which is alike prejudicial to agriculture, manufactures, and commerce, the intervention of the legiſlature is indiſpenſibly requiſite, as otherwiſe it is impoſſible to compel a fair converſion of the rents into money.

The weighing inſtruments of Orkney are likewiſe among the grievances which obſtruct the improvement of this territory. Theſe were brought from Norway at a very early period, and not only differ from thoſe in uſe on the Mainland, but the original ſtandards being loſt or deſtroyed, are themſelves fluctuating, and in ſome meaſure arbitrary. Theſe inſtruments are called the byſmer and pundler. The firſt conſiſts of a lever, or beam of wood, three feet long, and about three inches diameter from one end to near the middle, whence it tapers gently to the other end, which is not above one inch in diameter. From the middle, all along this ſmall end, iron pins are fixed at unequal diſtances, which ſerve to point out the weight of the body weighed. The pundler is ſo nearly ſimilar in form to the Statera-Romana, or Steelyard, as to ſuperſede any further deſcription, than merely to obſerve that the beam of which it is compoſed is about ſeven feet long, and between three and four inches in diameter. This inſtrument is employed in weighing malt, meal, beer, oats, and other groſs commodities; while the byſmer is made

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uſe of for aſcertaining the weight of butter, oil, ſalt, wool, cheeſe, and ſuch other articles as are commonly purchaſed in ſmaller quantities. The loweſt denomination of weight is the mark, twenty-four marks make a ſetteen or liſpund, the higheſt quantity weighed by the byſmer, ſix ſetteens, a meil, and twenty-four meils a laſt. So intricate are theſe weights, and ſuch the uncertainty that attends them, that even the natives, moſt accuſtomed to weighing, find great inconvenience ariſing from the uſe of them, and differ materially concerning the exact weight of each denomination. Some contend that the mark, which is the radical weight of which all the reſt are multiples, ſhould weigh eighteen ounces, while others aſſert it ſhould weigh twenty-two. The latter, however, is the moſt juſt, as well as the moſt prevalent opinion; of conſequence the ſetteen, or liſpund, ſhould contain thirty pounds, and the meil eleven ſtone four pounds, Amſterdam weight.

*Language, Manners, and Cuſtoms*.—The ancient language of Orkney was derived from the Gothic, which generally ſpread itſelf over Germany and Scandinavia. It was called the Norſe, but ſeems to have been a diſtinct dialect from that ſpoken either in Denmark, Sweden, or Norway, though it had a much greater ſimilitude to the laſt than to the others; but whether this difference was the reſult of chance and time, or was owing to a mixture of the old Pictiſh language, are queſtions of no eaſy ſolution. Such as it was, however, it continued to be ſpoken in great purity for two centuries after the iſlands became annexed to the crown of Scotland. Some perſons were even to be found who could ſpeak it with perfect eaſe within theſe fifty years back. At preſent it is only to be traced in the names of places and perſons; the Engliſh language, with a Norwegian accent, and a great mixture of Scottiſh terms and phraſes, having become the common language of all the iſlands.

The manners of the gentry in this country differ very little from thoſe of the ſame claſs in Edinburgh, where indeed they moſt frequently receive their education, and imbibe thoſe habits and feelings, which are ſeldom obliterated under any circumſtances of human life. They are generally kind without careſſing, civil without ceremony, and reſpectful without compliment; they are obliging and hoſpitable to ſtrangers, and when no party differences interfere, (which are unhappily too frequent,) ſocial and friendly among themſelves. Dr. Barry characteriſes them as diſtinguiſhed for their good ſenſe and literary acquirements, but blames them much for their ſupine indifference on the ſubject of religion, in which reſpect, however, the ſame author obſerves, they differ entirely from their female companions, whom he holds up as models of innocence, induſtry, and economy, and no leſs alive to the tender ſenſibility that adorns their ſex, than ſuperior in underſtanding and perſonal attractions.

The ſecond claſs of perſons, conſiſting of thoſe denominated tradeſmen and ſhopkeepers, reſide moſtly in the two principal towns, only a few being ſcattered over the iſlands. The traders reſident in the country, Dr. Barry repreſents as decent, peaceable, induſtrious, honeſt people, who commonly unite the buſineſs of the farmer with that of retail dealer. The ſhopkeepers of Stromneſs are ſaid to bear the ſame character, but in Kirkwall, though undoubtedly many exceptions are to be found, dealers are unhappily deficient both in induſtry and education. A ſimilar remark may be applied to thoſe who follow mechanical employments in that town.

With reſpect to the third claſs, which comprehends all thoſe connected with the cultivation of the land, ſuch as farmers with their ſervants and cottagers, it may in general be obſerved that they are, in a high degree, indolent, wedded to old cuſtoms, averſe from improvement, dark, artful, intereſted, and more reſpectful to their ſuperiors from fear than attachment. But with theſe defects and vices are blended ſome good and amiable qualities. In point of underſtanding they are ſcarcely inferior to any peaſantry in Great Britain. They are faithful in the obſervance of the marriage vow, affectionate to their children, and uſually honeſt in their tranſactions with one another, though negligent in payment of their rents. Their faults are the reſult of their oppreſſed and mean condition, and of the frauds practiſed upon them by unprincipled dealers in the towns, or by itinerant merchants, to whom they are compelled to diſpoſe of their own produce, either in barter for other goods, or at a long and uncertain credit. One remedy for this evil would be the eſtabliſhment of regular markets in different parts of the iſlands, which at preſent are much wanted.

Like the common people in moſt other places, thoſe of Orkney, whatever profeſſion they follow, are extremely credulous, and more inclined to truſt quacks in every line than men regularly bred and diſtinguiſhed for their judgment and education. The ſame diſpoſition leads them to give implicit belief to all the abſurd and ridiculous tales which are ſo frequently circulated reſpecting witches, fairies, and other ſupernatural agents. Hence a multitude of charms are ſtill in practice to ſecure good fortune, relieve diſeaſes, or to ward off ſome real or imaginary danger. Some days of the week are lucky, and others ominous of misfortune. Thurſdays and Fridays are the only days on which they incline to enter upon the marriage ſtate; and they are anxious, in the higheſt degree, to avoid doing it except when the moon is waxing. When intending to kill an ox or a ſheep, they are careful that it ſhall be done during the firſt quarters of that luminary, conceiving that if it is delayed till the waning, the meat will be of an inferior quality. In ſetting out on a voyage, they always turn their boats in the direction of the ſun's motion, and utter a ſhort prayer. Though Preſbyterians in profeſſion, they ſtill retain many relics of Romiſh ſuperſtition, and have a great veneration for ancient places of worſhip, eſpecially ſuch as have been dedicated to favourite ſaints. Theſe they invoke to aſſiſt them in any emergency, and vow to perform ſervices, or preſent oblations to them if their prayer is granted. The feſtivals of the Popiſh calendar are obſerved with the utmoſt punctuality, not indeed as times of religious worſhip, but as days ſet apart for feaſting and conviviality. On ſome of theſe days they refrain from work, and on others, only undertake work of a certain kind, and for a certain period. At one time they muſt go fiſhing, at another they carefully avoid that ſort of employment; now they muſt eat fiſh, now fleſh, now eggs, milk, &c. according as the particular day, or ſeaſon, may require.

*Antiquities*.—From the hiſtorical importance of the Orkneys, at a very early period, and during ſo many centuries after the Norwegian conqueſt, it might readily be conjectured that they muſt contain numerous remains of antiquity of different kinds, and aſſignable to different ages. This is accordingly the fact, and we believe few diſtricts are more worthy than theſe iſlands of antiquarian inveſtigation. All the ſhores and headlands abound with thoſe buildings which have been denominated Picts-houſes; but the preciſe uſe of which is not yet determined by the reſearches of the learned. Sometimes they appear ſingle and detached, and at other times are collected together in conſiderable numbers. One of them, at Quarterneſs, near Kirkwall, on the Mainland, is minutely deſcribed by Dr. Barry. (See POMONA.) At Stennis alſo, on the Mainland, is one of thoſe circles of ſtones, commonly regarded as Druidical temples, and on this, as well as on moſt of the other iſlands, may be ſeen a

number of huge ſingle ſtone monuments, of which it is not eaſy to conjecture the origin or intention. They are uſually from twelve to twenty feet in height above ground, and five or ſix feet in diameter each way; and as moſt of them are placed on loſty ſituations, it may juſtly excite wonder, how, in the ignorance of mechanical powers, they could be brought hither and erected. As they bear no inſcription, or hieroglyphics, nor any marks of an inſtrument, but are as rude and unpoliſhed as when dug up from the quarry, it ſeems conſonant to reaſon to conſider them as the monuments of a very early age, when the people were ignorant of arts and of letters. And this is all that can be ſaid concerning them, for not even tradition affords the ſmalleſt clew to determine the purpoſe of their erection. Some indeed have hazarded the ſuppoſition that they were intended to mark the ſpot that contained the bones of a deceaſed prince or chieftain, or to ſerve as a boundary between the lands of one great man and another; but the firſt idea is rendered extremely improbable by the fact that no tumuli, urns, or graves, have hitherto been found near them; and it is ſcarcely poſſible to conceive that any ſet of men would expend ſo much labour on landmarks as the quarrying, removal, and fixing of ſuch immenſe maſſes muſt of neceſſity have required. The writer of this article is therefore inclined to regard them as belonging to the ſame claſs of antiquities with the circles of Stennis, Avebury, or Stonehenge, that is, either as monuments of religion, or memorials of ſome great national event. In the iſland of Weſtray, are a number of ſtone ſepulchres ſcattered over two extenſive plains. Some of them have been opened, and found to contain human bones, and a variety of warlike and domeſtic inſtruments. Similar burying places have been diſcovered at Skael on the Mainland, and at Rowſholm in Stronſay. At Skael is likewiſe a curious cauſeway about a quarter of a mile long, compoſed of reddiſh ſtones impreſſed with a variety of figures. The veſtiges of many ancient buildings can be traced in different parts of the iſlands; and ſome ſtructures of leſs antiquity are ſtill tolerably entire. Among the latter may be mentioned the cathedral of St. Magnus, the biſhop's palace and the king's caſtle at Kirkwall. The firſt is kept in good repair, but the two laſt are extremely ruinous. In the iſland of Weir are the remains of the caſtle of Coppirow, or Cubbirow, built by Kobbem Stavanga, a man of great note in the twelfth century. This edifice forms a ſquare of fifteen feet on each ſide; and is ſurrounded by ditches and ramparts, which, with the ſtrength of its walls, evinces it to have been a fortification of no ſmall importance. Of the numerous other buildings characteriſed by ancient writers as lofty and magnificent piles, few retain traces ſufficient to mark decidedly the ſcite on which they ſtood. The biſhop's palace in Eagleſhay, the houſe of Siguid of Weſtneſs, that of Sween in Gairſay, the caſtle of Damſay, the reſidence of Thorkil in Sandwich, the palace of the earls in Orphir, and the celebrated palaces of the princes and biſhops in Birſa, are now completely demoliſhed. Theſe laſt ſtood on a fine lawn near the preſent church, and cloſe to the ſhore, oppoſite to what is called the burgh of Birſa, ſuppoſed to have been formerly a rock fortification, as ſome remnants of a wall are yet viſible on the land ſide. Here are numerous ruins of popiſh chapels, which continue to be much viſited by the common people, from motives of religious veneration. On the iſland of Rouſay is a high ridge or mound, which has received the name of the camp of Jupiter Fring. As it is plainly, however, a natural elevation, and bears no marks of human art either on it or around it, Dr. Barry is of opinion that its preſent appellation has originated with ſome whimſical genius in later times, probably on account of this ſpot being a favourite haunt of the eagle; the bird ſacred to the king of gods and men. Such other veſtiges of antiquity as ſeem worthy of notice, will be mentioned under the name of the iſland to which they may reſpectively belong. Hiſtory of the Orkney Iſlands by the Rev. Dr. Barry, 2d edition by the Rev. James Headrick, 4to. Lond. 1808. The preſent marchioneſs of Stafford has publiſhed a folio volume, with ſeveral etchings executed by her own hand, illuſtrative of the ſcenery, antiquities, &c. of the Orkneys; only 150 copies of this curious, and certainly intereſting volume, were printed, and thoſe for preſentation; when the copper-plates were deſtroyed. Fauna Orcadenſis, or the Natural Hiſtory of the Orkney and Shetland Iſlands, 4to. 1813, by the Rev. Geo. Low.

ORLAMUNDY, a town of Saxony, in the principality of Altenburg, at the conflux of the Orla and the Saal; 40 miles W.S.W. of Altenburg. N. lat. 50° 45′. E. long. 11° 25′.

ORLAND, a town of America, in Hancock county, and ſtate of Maine, ſituated on the eaſt bank of Penobſcot river, at its mouth, having Buckſtown on the north, Penobſcot on the ſouth, and Ellſworth on the eaſt; 17 miles N. of Caſtine.

ORLANDIN, Nicholas, in *Biography*, a learned Italian Jeſuit, was born at Florence in the year 1554. He entered the ſociety at the age of eighteen, and diſtinguiſhed himſelf by his proficiency in literature, particularly in the knowledge of the Latin tongue. Having finiſhed his ſtudies, he filled the poſt of Latin tutor in different houſes belonging to his order, till the ſtate of his health obliged him to relinquiſh that employment, when he was made rector of the college at Nola, and afterwards preſident of the ſeminary for novices at Naples. In the year 1598 he was ſent for to Rome, where he undertook the taſk of drawing up a grand hiſtory of the Jeſuits; but died in the year 1606, when he had completed only the firſt volume of the projected work. It was publiſhed at Rome in 1615, under the title of "Hiſtoriæ Societatis Jeſu Pars prima, ſive Ignatius." This work was continued by father Francis Sacchini, who at different periods publiſhed four volumes; and was at length brought down to the year 1616 by father Jouvency, who publiſhed a ſixth volume at Rome in 1710. Orlandin was the author of "Annuæ Litteræ Societatis Jeſu," for the years 1583, 1584, and 1586; and alſo of "Vita Petri Fabri Soc. Jeſ.," &c. Moreri.

ORLANDO di Lasso, a native of Mons, in Hainault, born 1520. Orlando not only ſpent many years of his life in Italy, but had his muſical education there; having been carried thither ſurreptitiouſly, when a child, on account of his fine voice. The hiſtorian Thuanus, who has given Orlando a place among the illuſtrious men of his time, tells us, that it was a common practice for young ſingers to be forced away from their parents, and detained in the ſervice of princes; and that Orlando was carried to Milan, Naples, and Sicily, by Ferdinand Gonzago. Afterwards, when he was grown up, and probably had loſt his voice, he went to Rome, where he taught muſic during two years; at the expiration of which, he travelled through different parts of Italy and France with Julius Ceſar Brancatius, and at length, returning to Flanders, reſided many years at Antwerp, till being invited by the duke of Bavaria to Munich, he ſettled at that court, and married. He had afterwards an invitation, accompanied with the promiſe of great emoluments, from Charles IX. king of France, to take upon him the office of maſter and director of his band; an honour which he accepted, but was ſtopped on the road to Paris, by the news of that monarch's death. After this event he returned to Munich, whither he was recalled by William, the ſon and



ſucceſſor

ſucceſſor of his patron Albert, to the ſame office which he had held under his father. Orlando continued at this court till his death, in the year 1593, at upwards of 70 years of age. His reputation was ſo great, that it was ſaid of him, "Hic ille Orlandus Laſſum, qui recreat orbem."

As he lived to a conſiderable age, and never ſeems to have checked the fertility of his genius by indolence, his compoſitions exceed in number even thoſe of Paleſtrina. There is a complete catalogue of them in Draudius, amounting to upwards of fifty different works, conſiſting of maſſes, magnificats, paſſiones, motets, and pſalms; with Latin, Italian, German, and French ſongs, printed in Italy, Germany, France, and the Netherlands.

He was certainly one of the moſt fertile and able muſicians whom Europe had then known, ſince the invention of counterpoint. Among the great number of his works, the "Magnum Opus Orlando di Laſſo complectens omnes Cantiones quas Motetas vulgò vocant tam antea editas, quàm hactenus nondum publicatas, a 2 ad 12 Voc., Monachii, 1604," 7 vols. in folio, is much eſteemed. But in France, his popularity chiefly aroſe from the great number of ſongs by Ronſard and Clement Marot, which he ſet to muſic, and which were printed by Adrian le Roy, from 1576 to 1584. His compoſitions were in high favour in England, during the reign of queen Elizabeth.

Two of Orlando di Laſſo's ſons, Ferdinand and Rodolph, were able muſicians, and both in the ſervice of Maximilian, duke of Bavaria; the eldeſt as chapel-maſter, and the other as organiſt to that prince. They were theſe muſicians who collected their father's works, in 7 vols. folio, and publiſhed them in a very ſplendid and ſumptuous manner, dedicating them to their patron, the ſovereign of Bavaria. The general reception, however, of theſe compoſitions ſeems not to have equalled the expectations of the editors: other productions had taken poſſeſſion of the public ear and favour. It is, we fear, in vain to hope for the revival of old muſic; too many are intereſted in the ſucceſs of the new; and ſuch are the viciſſitudes of what are called taſte and expreſſion in this art, that if ſufficient probity and zeal could be found in faſhionable performers, to incline them to attempt doing juſtice to the productions of former times, it is hardly poſſible for them to ſucceed; the accent, energy, and expreſſion are either loſt in the execution, or unintelligible to the hearers. There is, indeed, as little chance for a muſician of the preſent age to perform ſuch productions in the manner of the times in which they were compoſed, as to pronounce a foreign language as well as his own; and if, againſt all calculation, he ſhould ſucceed, this muſic will ſtill be an unknown tongue to the public.

We ſaw, in 1772, Orlando's tomb in the Recollet's church-yard at Munich. On it are carved his own figure, with thoſe of his wife, three ſons, and eight daughters, kneeling by him; date 1595, with a long Latin epitaph.

ORLAY, Bernard Van, was born at Bruſſels about the year 1490. He went to Rome to ſtudy painting, when very young, and had the good fortune to become a diſciple of Raphael Sanzio.

Upon his return to Brabant, he was appointed principal painter to the governeſs of the Netherlands, and was employed for ſeveral years by the emperor Charles V., being conſidered as one of the beſt painters of his time.

The prince of Naſſau engaged him to paint ſixteen cartoons, as models for tapeſtries, which were intended for the decorations of his palace at Breda. Each cartoon conſiſted of only two figures, a knight and a lady on horſeback, repreſenting ſome of the Naſſau family. They were thought worthy of a ſcholar of Raphael, and were afterwards copied by Jordaens in oil. He died in 1560, aged 70.

Orlay, Richard Van, was born at Bruſſels in 1652, the ſon of Peter Van Orlay, an indifferent landſcape painter, from whom, of courſe, Richard firſt received the rudiments of his art.

He furniſhed the world with a prodigious number of works, and is one of thoſe who have contributed to puzzle the connoiſſeurs, by having at different periods choſen different maſters as his models, and made compoſitions in their peculiar taſtes of ſtyle. Altano, Pietro da Cortona, and frequently Nicolo Pouſſin, ſuffer in reputation, by having Van Orlay's labours attributed to them, which are nevertheleſs ingenious enough to give their author a decent place in the ſcale of artiſts. He died in 1732, aged 80.

ORLE, Orlet, or *Orlo*, in *Architecture*, a fillet under the ovolo, or quarter-round of a capital.

The word is French, formed from the Latin *orletum*, or *orlum*, of *ora*, a *border* or *liſt*.

When it is at the top or bottom of the ſhaft, it is called the *cincture*.

Palladio alſo uſes orlo for the plinth of the baſes of columns and pedeſtals.

Orle, in *Heraldry*, is an ordinary in form of a fillet, drawn round the ſhield, near the edge or extremity thereof, leaving the field vacant in the middle. Or it is an inner border (ſee Border), of the ſame ſhape as the eſcutcheon, which doth not touch the extremities of the ſhield, the field being ſeen within and round it on both ſides; ſo that it appears like an eſcutcheon voided.

Its breadth is but half that of the bordure, which contains a fifth part of the ſhield; the orle only a tenth; add, that the orle is its own breadth diſtant from the edge of the ſhield; whereas the bordure comes to the edge itſelf.

There is ſometimes one orle, ſometimes there are two, and ſometimes three. When there are three, or more, they take up the whole ſhield. It is ſometimes borne flory, or counter-flory, or like the *treſſure*; which ſee.

The form of the orle is the ſame with that of the ſhield; whence it reſembles an ineſcutcheon; as repreſented in the *Plate* of *Heraldry*.

The edges of the orle may be ingrailed, indented, inverted, &c. When any bearings, as martlets, trefoils, &c. are placed round an eſcutcheon, on a field, they are termed, or ſaid to be, *in orle*. Some writers mention the number of martlets: but in this, ſays Edmondſon, they expreſs themſelves erroneouſly; becauſe martlets, trefoils, &c. when placed *in orle*, are always eight in number.

ORLEANA, in the *Materia Medica*, the name of the arnotto, or roucou.

ORLEANOIS, in *Geography*, a province of France, before the revolution, bounded on the north by Normandy and Iſle de France, on the eaſt by Iſle de France, on the ſouth by Nivernois, Berri, and Touraine, on the weſt by Maine and Perche; lying between 47° 15′ and 48° 40′ N. lat., and between 0° 35′ and 3° 30′ E. long.; being 33 leagues from north to ſouth, and 42 from weſt to eaſt. This government included Orleanois proper, Sologne, Blaiſois, Beauce, Dunois, Vendomois, the greateſt part of Gatinais, and Perche Gouet. It derived its name from Orleans, its capital. The foreſt of Orleanois, north of the capital, is 15 leagues long, and from two to five broad. This province, together with the Blaiſois and Chartrain, is now divided into the three departments of Loire and Cher, the Loiret, and the Eure and Loire.

ORLEANS, Peter Joseph de, in *Biography*, was born at Bourges in 1641, of an ancient family, in the pro-

vince of Berry. He entered into the ſociety of Jeſuits in 1659, became a very popular preacher, but was particularly famous for his hiſtorical compoſitions, in which he aſſiduouſly employed himſelf till his death, which happened at Paris, in the year 1698. His principal work, and that by which he is moſt known, is his "Hiſtoire des Revolutions d'Angleterre," in three volumes. "But Engliſh hiſtory," ſays the writer in the General Biography, "is a ſubject on which it is impoſſible for a Jeſuit to write with a proper ſpirit; and that of father d'Orleans may be judged of, from his calling Magna Charta 'the rock on which the royal authority is ſplit, and the ſource of all the contentions which have ſince agitated England,' while at the ſame time he avoids giving a view of the contents. From the reign of Henry VIII., if his narrative improves in intereſt and vivacity, it is ſtill more diſtorted by the prejudices of his order." The next conſiderable work of this author is entitled "Hiſtoire des Revolutions d'Eſpagne." The titles of ſeveral other of his works are given in the General Biog.

Orleans, Lewis, *Duc de*, firſt prince of the blood in France, was ſon of Philip, duke of Orleans, afterwards regent of the kingdom, and born at Verſailles in the year 1703. At the early age of ſixteen he was introduced into the council of the regency, made governor of Dauphiné, and nominated grand maſter of the order of our Lady of Mount Carmel and St. Lazarus. In 1724 he married a princeſs of Baden, with whom he lived very happily about two years, when he had the misfortune to loſe her by a premature death. This event led him to renounce the world, and to devote himſelf wholly to devotional exerciſes, and the ſtudy of religion and the ſciences. In the year 1730 he took an apartment in the abbey of St. Genevieve, in which he at length became a conſtant reſident. He expended his immenſe income in the moſt laudable acts of beneficence, and at the ſame time applied himſelf with great diligence and ſucceſs to his literary and ſcientific ſtudies, making himſelf maſter of the Hebrew, Chaldee, Syriac, and Greek languages. He alſo became well acquainted with the writings of the ableſt divines, eccleſiaſtical hiſtorians, and fathers. He was likewiſe extremely well verſed in general hiſtory, geography, botany, chemiſtry, natural hiſtory, natural philoſophy, and the art of painting. He fell a ſacrifice to the intenſeneſs of his ſtudy, and to the ſeverity of the diſcipline to which he ſubjected himſelf, and died in 1752, when he was in the 59th year of his age. He left behind him a vaſt number of theological works, ſome of which poſſeſſed great merit. They, and a very valuable library, were bequeathed by him to the Dominican order. His ſon Lewis Philip, duke of Orleans, died in 1785, at the age of 60. Moreri.

Orleans, Philip Louis Joseph, *Duke of*, was born at St. Cloud in 1747, and became exceedingly notorious in the late revolution. In his youth, his title was that of duke of Chartres. He was brought up to the ſea-ſervice; and in 1778 we find him on board the fleet, commanded by count d'Orvilliers: but we have no account of his having diſtinguiſhed himſelf at that, or any other time. It has indeed been recorded, to his diſgrace, that, in the action with Keppel, he went down into the hold, and refuſed to appear on deck till the engagement was over. This fact, if true, would be ſufficient to put a ſtamp on his character for every thing that was bad: cowardice, in a military officer, is reckoned, of all others, the foulеſt ſtain that can attach to it. After this, however, he was raiſed to a ſtill higher rank in the navy, but without having any opportunity of redeeming his credit, or of adding to his diſgrace. Upon his return, he became extremely diſſipated; and anxious to ſignalize himſelf, where he probably expected little danger, he joined the popular party againſt the meaſures of the court. He violently oppoſed the regiſtering the edicts of the king, as an infringement of the rights of parliament; and entered his written proteſt againſt it. The parliament confirmed the proteſt; and on the next day the duke was ordered to retire to his country-ſeat, at the diſtance of 15 leagues from Paris, and to receive no company there, excepting his own family. He was regarded as the victim to the power of the court. As firſt prince of the blood, his ſituation allowed of no increaſe of dignity; his immenſe revenue was thought to exceed that of any other ſubject in Europe: therefore, as far as honour or wealth was concerned, he could not expect any augmentation, by a change in the government; his conduct was accordingly regarded by the maſs of the people as purely patriotic, and he obtained the title of "Prince of the patriots." He was not contented with this, but was deſirous of going before the public; and accordingly, at a later period, he aſſumed the title of citizen Egalitè. He was elected preſident of the national aſſembly in 1789, but he declined the honour intended him. About this time, the people were ſuffering moſt grievouſly by a ſcarcity, almoſt approaching to a famine; and he liberally expended his immenſe income in relieving, as far as he was able, thoſe neceſſities which he could not avert: hence he became not only obnoxious to the champions of arbitrary power, but was looked upon with extreme jealouſy by thoſe who hoped to riſe by the favour of the multitude, and who, having little or no fortune with which to purchaſe their voices, found themſelves eclipſed by his ſuperior rank and influence. Theſe inſinuated that the name and popularity of the duke might be applied to purpoſes the moſt dangerous; and the duke, who it was thought had given no inſignificant proof of his forbearance, by declining the proffered honour of preſident of the national aſſembly, now eſtabliſhed his character for moderation, by yielding to the wiſhes of his ſovereign, and accepting a commiſſion to the court of St. James, he withdrew himſelf from the eyes of his partial countrymen. This was towards the cloſe of the year 1789; but in the beginning of the following year, rumours were propagated, and reports induſtriouſly circulated, the moſt injurious to the reputation of the duke of Orleans. But that prince, by his ſudden and unexpected return, confounded the malice of his enemies, and ſet at defiance charges that would probably have never been made in his preſence, and which, as they were unſupported by circumſtances, were treated by the national aſſembly as frivolous, and unworthy of any credit. Notwithſtanding this acquittal, he was ſuſpected by thoſe who were neither deficient in penetration nor candour, of having very ambitious deſigns, and of ſecretly attempting the dethronement and deſtruction of the royal family. This became more apparent, from his conduct on the trial of the king. In the courſe of that tranſaction, nothing created greater ſurpriſe and horror than that the ſelf-created l'Egalitè ſhould vote, not only for the death of his ſovereign and very near relation, but againſt allowing him any appeal to the people. It was ſaid in his juſtification, that he intended to have abſtained from giving his vote, but that he was terrified into the act by the threats of the ferocious Robeſpierre. When, on the firſt queſtion of guilty, or not guilty, he pronounced the affirmative, a general murmur pervaded the convention: his vote againſt the appeal to the people was received with equal indications of ſurpriſe; and his opinion on the third queſtion of life or death was awaited with curioſity and impatience. From the tribune he deliberately pronounced theſe words: "Influenced by no conſideration but that of performing my duty; convinced that all who have conſpired,

or who ſhall hereafter conſpire, againſt the ſovereignty of the people deſerve death; I VOTE FOR DEATH." The aſſembly, though not remarkable for its compaſſion, when the king or his family was concerned, was in a general ferment: one member, ſtarting from his ſeat, and ſtriking his hands together, exclaimed, "Ah, le ſcelerat!" and many joined in the expreſſion, and added, "Oh, l'horreur! Oh, le monſtre!" This was in January 1793; and before the cloſe of the year, he was doomed to a like fate. On the 2d of November he was brought to Paris, and on the 6th he was convicted and executed, unpitied by perſons of all parties. In his way to the ſcaffold, he was overwhelmed with all the abuſe and indignities that a rancorous and cruel populace could deviſe; but on that occaſion, aware that he did not merit the perſecution of the people, from whom it came, and on whom he had liberally expended his property, he called forth a degree of dignity and courage that was unexpected, and ſubmitted to the blow with decent fortitude. Adolphus's Hiſtory of France, 1803. Hiſt. of Revolution, by Rabaut de St. Etienne.

ORLEANS, in *Geography*, a city of France, and principal place of a diſtrict, as well as capital of the department of the Loiret. It is divided into three parts, containing 36,165 inhabitants; and its three cantons contain 45,630 inhabitants, on a territory of 12½ kiliometres, in one commune. It was formerly called Aureliana Civitas, Cenabum or Genabum, and being the capital of the province of Orleanois, was a biſhop's ſee, the reſidence of the Merovingian line, and the ſeat of five councils. The city is large and indifferently built; it contains a cathedral of excellent Gothic architecture with a handſome ſpire, 22 pariſh churches, an old univerſity, and a literary ſociety. The city is pleaſantly ſituated at the foot of a declivity bathed by the Loire; 24 leagues S S.W. of Paris. Without including ſeveral ſuburbs, the city is 2396 toiſes in circuit, formerly environed by a wall and ditch. The mall is an agreeable walk, 2890 feet in length: and here is a fine ſtone bridge of 16 arches over the Loire. Orleans has ſome traffic in corn, wine, and brandy; its manufactures are cloth, ſtockings, refining of ſugar, &c. North of it is an extenſive foreſt, and the country from hence to Paris is flat and unintereſting. This city was taken by Julius Cæſar; in 451 it was beſieged by Attila, king of the Huns, who was defeated by Theodoret, king of the Goths, aſſiſted by Ætius, the general of Valentinian, and the king of the Franks. It was taken by the Normans twice, *viz.* in 855 and 865. The ſiege of the Engliſh in the year 1429, was raiſed by the conduct of Jean de Arc, commonly called the Maid of Orleans. N. lat. 47° 54'. E. long. 1° 59'.

ORLEANS, a county of America, being the middle of the three northern counties of Vermont; a part of the lake Memphremagog projects into the northern part of it from Canada. It contains 27 townſhips: the land is high, and ſends its waters almoſt in every direction. Clyde, Barton, and Black rivers empty into lake Memphremagog; the waters of many branches of Miſſiſcoui, Le Moelle, and Onion rivers, riſing here, fall into lake Champlain; thoſe of Mulhegan and Paſanopſie diſcharge themſelves into Connecticut river. This county contains 1439 inhabitants. —Alſo, a poſt-town of Barnſtaple county, Maſſachuſetts, taken from the ſoutherly part of Eaſtham, and incorporated in 1797; 91 miles from Boſton. Clams are found here in abundance, and conſtitute a profitable article of traffic. One thouſand barrels, of the value of ſix dollars a barrel, are in ſome years ſalted here. The number of houſes in 1800 amounted to 141, and the whole population conſiſted of 174 families, and 1095 perſons.

ORLEANS, *Iſle of*, an iſland of Canada, ſituated in the river St. Lawrence, at a ſmall diſtance below Quebec, remarkable for the richneſs of its ſoil. The S.W. end of the iſland is called Point Orleans. The coaſt is rocky for a mile and a half within the S. channel, where is a careening place for merchants' ſhips. Round Point Levi, and along the S.E. ſide of the river, the ſhore is rocky, but the middle of the baſon is entirely free.

ORLEANS, *New*, the capital of Louiſiana, in North America, ſituated on the E. bank of the Miſſiſippi, 95 miles from the mouth of the river. N. lat. 30° 2'. W. long. 89° 53'. The town is regularly laid out, the ſtreets running at right angles, but they are very narrow, and unpaved. This town ſuffered much by fire in 1788, being reduced from 1100 to 200 houſes in three hours; but it has been ſince rebuilt, principally of brick, and not as before of timber, with flated roofs. Thoſe that are conſtructed of brick conſiſt of two ſtories, without cellars; and the old wooden houſes are of one ſtory, raiſed from the ground for the accommodation of cellars. Some few houſes have piazzas. The public buildings are, a handſome Catholic church, a government houſe, a calabozo or priſon, which alſo ſerves as a court-houſe, a convent, barracks for the ſoldiers, king's hoſpital, a lunatic hoſpital, and a ſmall market-houſe. The ſide next the river is open, and ſecured from its inundations by a raiſed bank, which extends to a diſtance of more than 50 miles. To the N.E. of the town are large marſhes, which contribute to render it unwholeſome in ſummer and autumn, particularly to ſtrangers; whereas the conſtant inhabitants are never afflicted by the epidemic diſeaſes which prevail among foreigners, but are ſaid to be as long-lived as the inhabitants of the northern parts of the United States. Lake Ponchartrain communicates with the town by means of the creek St. John, which proceeds from the lakes through a courſe of ſix miles, and within two miles of the town. But a bar at the entrance of this creek prevents veſſels that draw more than three or four feet of water from entering; but ſmall craft are numerous, and paſſing from Mobile, Penſacola, and the adjacent country, bring their tar, lime, &c. to market by means of this communication. A canal was formed in 1792 from the creek to the town; and at the mouth of the creek where it enters the lake is a ſmall fort of ſix guns. In the year 1802 the principal aggregate exports of American and Spaniſh produce have been eſtimated at

| | Dollars. |
|---|---|
| 30,000 bales of cotton, value - | 2,000,000 |
| 8,000 hogſheads of ſugar, do. - | 480,000 |
| 90,000 hogſheads of flour, do. - | 400,000 |
| Total | 2,880,000 |

In the ſame year were exported, of former crops, about 300,000 lbs. of indigo, value 300,000 dollars. Conſiderable quantities of deer-ſkins and ſome furs are alſo exported; alſo tobacco, ſalt beef and pork, hams, lard, &c. from the Illinois and Ohio rivers. The inhabitants of New Orleans were eſtimated in 1802 to be 10 or 11,000. Its ſituation, not far from the ſea, on a noble river, in a very fertile country, under a ſalubrious climate, and near Mexico, but ſtill nearer to the French, Spaniſh, and Britiſh Weſt India iſlands; with the moral certainty of its becoming a general receptacle for the produce of the extenſive and valuable country on the Miſſiſippi, Ohio, and its other branches, afford advantages which ſeem to enſure the growing proſperity of this city, more eſpecially as it is now in the poſſeſſion of the United States. Morſe.

ORLENGA, a town of Ruſſia, in the government of Irkutſk, or the Lena. N. lat. 56°. E. long. 105° 40'.

ORLEY, a town of Pruſſia, in Oberland; 16 miles N.N.E. of Soldau.

ORLIAC, a town of Croatia; 20 miles S. of Carlſtadt.

ORLOI, a town of Lithuania; 60 miles E. of Pinſk.

ORLOP, in *Ship Building*, a tier of beams below the lower deck of large ſhips, the intervals of which are framed with earlings, and laid with oak board along the midſhips of the ſhip, chiefly for the convenience of ſtowing away the cables. There is alſo a *platform* in the midſhips of ſmaller ſhips, called the *orlop*, and for the ſame purpoſe.

ORLOV, in *Geography*, a town of Ruſſia, in the government of Viatka, on the Viatka. N. lat. 58° 20'. E. long. 49° 44'.—Alſo, an iſland in the Caſpian ſea. N. lat. 45° 50'. E. long. 53° 14'.—Alſo, a river of Ruſſia, which runs into the Tchernaia, N. lat. 65° 20'. E. long. 168° 14'.

ORLOVKA, a river of Ruſſia, which runs into the Irtiſch, N. lat. 53° 50'. E. long. 75° 24'.—Alſo, a river of Ruſſia, in the government of Archangel, which runs into the Frozen ocean; 28 miles N. of Ponoi.

ORLOVOGORODITSCHE, a town of Ruſſia, on the river Iſchim; 120 miles S.E. of Tobolſk. N. lat. 56° 32'. E. long. 70° 44'.

ORLOVSKOE, a government of Ruſſia, bounded on the N. by the governments of Smolenſk and Kaluga, on the W. by Smolenſk and Novgorod Sieverſkoi, on the S.W. by Novgorod Sieverſkoi, on the S.E. by Kurſkoi and Voroneztſkoi, and on the E. by Tambovſkoe and Tulſkoe: its length from E. to W. is 208 miles, its breadth variable from 20 to 100. N. lat. 50° to 54°. E. long. 33° 14' to 39°.

ORLUCE, a town of Poland, in the palatinate of Sandomirz; 8 miles N.W. of Kreminiek.

ORLY, a town of Lithuania, in the palatinate of Brzeſk; 44 miles E. of Pinſk.

ORME, Robert, in *Biography*, the ſon of Dr. Alexander Orme, a phyſician and ſurgeon in the ſervice of the Eaſt India Company, was born at Anjengo, in the Travancore country, in 1728. He was ſent to England for his education, and was entered at Harrow-ſchool when he was only ſix years of age. After he left ſchool, he was placed for a year in the office of the accomptant-general of the African Company, in order that he might be initiated in commercial tranſactions, and then he embarked for Calcutta, where he arrived in 1742. At firſt he was not in the Company's ſervice, but when once engaged for them, he acquired the higheſt reputation for the zeal with which he entered into their intereſts. At the ſame time he made the deepeſt reſearches into the inſtitutions, manners, and cuſtoms of the natives of India, ſo that, in the year 1752, when ſome regulations were thought neceſſary in the police of Calcutta, he was deſired to give his opinion on the ſubject. He accordingly drew up the greater part of "A General Idea of the Government and People of Indoſtan." In 1753 he returned to England, and was frequently conſulted by men in power on Indian affairs, and reſpecting plans, at that time in agitation, for ſupporting the Britiſh intereſt in Hindooſtan. Mr. Orme reviſited India in 1754, having already been appointed by the court of directors a member of the council at Fort St. George. He ſeconded, by his able and ſpirited advice, thoſe meaſures which annihilated the French power in that country, and gave to the Engliſh that decided aſcendancy which they have ever ſince poſſeſſed. Mr. Orme held the office of commiſſary and accomptant-general during the years 1757-8, but in the latter year his health obliged him to embark for England. He was taken priſoner on his return, and carried to Mauritius, from whence he was embarked for the Cape of Good Hope. He arrived in England in the autumn of 1760, and ſettling in London, began to collect a choice library, and to employ himſelf in preparing a work on the Military Tranſactions in India. The firſt volume was publiſhed in 1763, entitled "The Hiſtory of the Military Tranſactions of the Britiſh Nation in Indoſtan from the Year 1745." This volume brought down the hiſtory to the year 1756. An hiſtorical diſſertation on the Mahomeddan conqueſts and eſtabliſhments in that country, compriſing a view of the peculiar character and cuſtoms of the Hindoos, was prefixed. It was extremely well received by the public. The Eaſt India Company, duly ſenſible of his merits, and of the importance of his hiſtorical reſearches, not only gave him free acceſs to all their records, but appointed him to be their hiſtoriographer, with a ſalary of 400*l. per annum*. To obtain the moſt accurate information reſpecting the war which was to be the ſubject of the ſecond volume, he went over to France in 1773, where he was furniſhed liberally with various authentic documents. It was not till 1778 that the work was brought to its completion. The ſecond volume was now publiſhed, which contained all the events which took place in the Engliſh ſettlements in India from 1756 to 1763, with an inveſtigation of the riſe and progreſs of the Engliſh commerce in Bengal, and an account of the Mahommedan government from its eſtabliſhment in 1200. In 1782 Mr. Orme publiſhed a work, entitled "Hiſtorical Fragments of the Mogul Empire of the Marattoes, and of the Engliſh Concerns in Indoſtan from the Year 1659." This, which was an octavo volume, was his laſt publication, for though his literary purſuits were unremitted, yet his health was unequal to the exertions required for the compoſition. In 1792 he left the metropolis, to enjoy in retirement the ſociety of his friends, and the recreation afforded by a well aſſorted library. In January 1802 he died in the ſeventy-third year of his age. "The intellectual character of Mr. Orme," ſays his biographer, "was chiefly marked by good ſenſe, ſagacity, and judgment. To theſe qualities were added an active curioſity, and a cultivated taſte, which fitted him both for the collection and for the lucid arrangement and happy diſplay of hiſtory. He poſſeſſed a refined taſte for muſic, the arts of deſign, and poetry, and among his literary compoſitions are ſome elegant copies of verſes."

After his death his "Hiſtorical Fragments" were reprinted in a quarto volume, with the addition of a paper on the "Origin of the Engliſh Eſtabliſhment, and of the Company's Trade at Broach and Surat;" and another, containing "A General Idea of the Government and People of Indoſtan." To this volume is prefixed an account of the life and writings of the author, to which our readers are referred for farther information.

Orme, L', in *Geography*, a town of France, in the department of the Nievre, and chief place of a canton, in the diſtrict of Clamecy. The place contains 2416, and the canton 12,788 inhabitants, on a territory of 375 kiliometres, in 10 communes.

Orme's *Head, Great*, a cape on the N. coaſt of Wales, in the county of Carnarvon. N. lat. 53° 24'. W. long. 2° 5'.—Alſo, *Little Orme's Head*, a cape on the ſame coaſt, five miles S.E. of the former.

ORMEA, a town of France, in the department of the Stura, on the Tanaro; 10 miles S. of Ceva.

ORMILLOS, Los, a town of South America, in the province of Tucuman; 36 miles N. of St. Salvador de Jugui.

ORMO, a ſmall iſland in the Baltic, between the coaſt of

of Finland, and the iſland of Aland. N. lat. 60° 27′. E. long. 20° 43′.

ORMOND, the name of two extenſive baronies in the county of Tipperary, Ireland, diſtinguiſhed by the terms Upper and Lower. From them the illuſtrious family of Butler took the titles of earl and duke of Ormond.

ORMOSIA, in *Botany*, a genus founded by the late Mr. George Jackſon, F.L.S. and named by him from ὅρμος, *a necklace*, or *ſtring of beads*, becauſe the beautiful ſeeds, parti-coloured of ſcarlet and black, are worn, by ladies, in the Weſt Indies, as well as in Europe; being uſually intermixed with thoſe of *Abrus precatorius*, with which they agree in colours, though they greatly exceed the *Abrus* in ſize. Jackſon Tr. of Linn. Soc. v. 10. 358. Brown in Ait. Hort Kew. ed. 2. v. 3. 3. Claſs and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, ſhort, bell-ſhaped, gibbous at the baſe, two-lipped; upper lip two-lobed; lower in three deep ſegments. *Cor.* papilionaceous, of five petals, with linear claws; ſtandard roundiſh, emarginate, erect, ſcarcely longer than the wings, convex; wings two, oblique, obtuſe, ſomewhat heart-ſhaped at the baſe; keel of two obtuſe hatchet-ſhaped petals, the length of the wings. *Stam.* Filaments ten, ſeparate, awl-ſhaped, the length of the corolla, concealed in the keel; anthers roundiſh, of two cells. *Piſt.* Germen ſuperior, ovate-oblong; ſtyle the ſize and ſhape of the filaments, incurved; ſtigmas two, obtuſe, approximated, one above the other. *Peric.* Legume woody, compreſſed, of two valves and one cell. *Seeds* one or more, orbicular, compreſſed, large, coloured.

Eſſ. Ch. Calyx five-cleft, two-lipped. Corolla papilionaceous. Stigmas two, approximated, obtuſe; one of them lateral. Legume woody, compreſſed. Seeds one to three.

1. O. *coccinea*. Scarlet Necklace-tree. Jackſ. Tr of Linn. Soc. v. 10. 360. t. 25. (Robinia coccinea; Aubl. Guian. v. 2. 773, excluding Plumier's ſynonym.)—Leaves pinnate; leaflets coriaceous, ovate, revolute, naked on both ſides. Legume ſmooth and ſhining.—Native of Guiana; not yet introduced alive into Europe. A *tree*, with zigzag branches, clothed with ruſty down. *Leaves* a foot long or more, compoſed of from four to ſix pair of ſtalked leaflets, each near three inches in length, elliptical or ovate, and entire, furniſhed with a ſtrong midrib, and many fine tranſverſe veins. *Stipulas* in pairs, diſtinct from the footſtalk. *Flowers* in a large, terminal, racemoſe paniele, purpliſh. *Legume* ſhort, very hard and ſhining. *Seeds* moſtly ſolitary, rarely two, ſhining, ſcarlet with a large black ſpot.

2. O. *daſycarpa*. Ruſty-podded Necklace-tree. Jackſ. n. 2. t. 26. Ait. n. 1. (Sophora monoſperma; Swartz Ind. Occ. 722. Willd. Sp. Pl. v. 2. 501.)—Leaves pinnate; leaflets numerous, pointed, flat, ſmooth on both ſides. Legume downy.—Native of Jamaica and other parts of the Weſt Indies; brought by Capt. Bligh, in 1793, to Kew, where it flowers in the ſtove in June and July. Much like the former, but differing in the above characters. The *legume* is often orbicular, with one ſeed only; ſometimes oblong, with two or three.

3. O. *coarctata*. Cloſe-flowered Necklace-tree. Jackſ. n. 3. t. 27.—Leaves pinnate; leaflets unequal; naked above; ruſty and hairy beneath.—Gathered by Mr. Alexander Anderſon in Guiana. The *leaves* are ſmaller than in the laſt; their leaflets gradually larger as they recede from the branch. *Panicle* denſe and ſhort, though of many flowers. *Germen* hairy. *Seeds* like the laſt, but ſmaller.

ORMSKIRK, in *Geography*, a market town in the hundred of Weſt-Derby, and county palatine of Lancaſter, England, is ſituated at the diſtance of 40 miles S. by W. from Lancaſter, and 209½ miles N.W. by N. from London. It conſiſts chiefly of four principal ſtreets, which interſect each other nearly at right angles. The property of this town anciently belonged to Burſcough priory, in the neighbourhood. Edward I. conferred on it the privilege of a market and fair, and this grant was renewed and confirmed by his ſucceſſor, with additional immunities. Ormſkirk at preſent is a conſiderable manufacturing place; a large quantity of cotton, and thread for making ſail-cloth, being ſpun here, both by the hand and by means of machinery. Here are held the petty ſeſſions for the Ormſkirk diviſion of the hundred. The market day is Saturday weekly, and there are two fairs during the year. The church, an ancient ſtructure, with a tower at one end, poſſeſſes the remarkable feature of having a ſpire entirely detached from it. The reaſon of this ſtrange circumſtance remains unknown; but as it is an anomaly in our ſacred architecture, it ſeems not unlikely to have been merely the reſult of whim, to which ſource indeed it is aſcribed by tradition. The interior of this church contains ſeveral monuments in honour of the Stanlies, earls of Derby.

According to the parliamentary returns of 1811, Ormſkirk compriſes 678 houſes, and 3064 inhabitants, which is an increaſe, ſince 1801, of 64 houſes, and 510 perſons.

Two miles north from the town ſtand the remains of Burſcough priory. This houſe was founded in the time of Richard I. by Robert Fitzhenry, lord of Lathom, who beſtowed upon the monks conſiderable property, emoluments, and alms. Lathom-houſe, ſituated in its vicinity, is noted for the vigorous defence which Charlotte, counteſs of Derby, made againſt the parliamentary forces diſpatched to beſiege it in the reign of Charles I. After loſing about two thouſand men, the republican commanders were compelled to raiſe the ſiege, by the approach of prince Rupert, without having been able to bring the heroic counteſs to ſubmiſſion either by force or perſuaſion. The preſent houſe is the ſeat of E. Wilbraham Bootle, eſq. M.P. Beauties of England and Wales, vol. iv., by John Britton, F.S.A.

ORMUS, or HORMUZ, an iſland of Aſia, at the entrance of the Perſian gulf, about 10 miles in circumference; diſtant about five miles from the continent of Perſia, and ſomewhat more than 25 from that of Arabia, formerly much celebrated, but now retaining little or nothing of its ancient ſplendour. It has lately belonged to Mulla Ali Shah, a Perſian, who made himſelf maſter of it immediately after the death of Nadir Shah, whoſe admiral he had been. This prince of Ormus poſſeſſes likewiſe a part of the iſle of Kiſheme, the other part being ſubject to the prince of Seer. This ſmall iſland is traverſed by a high mountain from E. to W., and is believed to be anciently a volcano; it is full of rocks, barren and deſtitute of all neceſſaries, except ſalt, of which there is ſuch plenty, and that ſo hard, that it is ſaid to be uſed in building houſes. The ſoil is compoſed of a white ſand, formerly imported into Europe. It has no water but that which is preſerved, after rain, in ciſterns; ſo that, in its moſt flouriſhing times, when it was the emporium of this part of the world, its inhabitants had not only their victuals, but alſo the water they uſed from the continent. The air in ſummer was ſo exceſſively ſultry, that people were forced to live in grots. Its commodious ſituation, however, rendered it formerly the moſt famous mart in the Eaſt. Ships repaired hither from all parts of the Indies, from the coaſts of Africa, Egypt, and Arabia, and a regular trade was carried on by caravans acroſs the country. Hence its ſovereigns, who poſſeſſed ſome ſmall territory upon the continent of Perſia, became rich and powerful; and at proper ſeaſons of the year, merchants reſorted to it from

from all countries, and particularly the Venetians, who carried on a great trade in jewels tranſported from hence to Baſſora, and by caravans to Aleppo, or to Suez by ſea, then overland, by the Nile, to Alexandria, where they were delivered to the merchants to whom they were conſigned. Its commercial accommodations and celebrity drew the attention of the Portugueſe, who made themſelves maſters of the town and citadel. The former ſtood upon the ſea-coaſt, and conſiſted of about 3000 houſes; and the inhabitants, conſiſting of Arabians, Mahometans, Indians, and Jews, were eſtimated at 40,000. The fortreſs built on a point of land was regular, beautiful, and ſtrong; and at length furniſhed with 300 pieces of cannon. Caravans paſſed twice a year, *viz.* in April and September, from Aleppo to Baſſora, and thence were tranſported to the iſle of Ormus. Theſe caravans conſiſted of 5 or 6000 perſons, and brought with them articles of immenſe value. At the ſame time, private ſhips navigated the ſea from Malacca, and the caravans that traverſed Perſia, brought vaſt quantities of rich and valuable commodities. The city and caſtle of Ormus were in ancient times deemed the pride and glory of the Eaſt, the magnificence of which was expreſſed after the oriental manner, in this phraſe, "that the world being round as a ring, Ormus might be conſidered as its jewel." By the wealth which flowed into and from it, in the manner already related, it became the richeſt and moſt buſy, not to add the moſt delightful place in the world. This city was founded at the beginning of the 14th century; and the famous Perſian monarch, Shah Abbas, with the aſſiſtance of the Engliſh, deſtroyed it in 1622, hoping thus to transfer its trade to Gambroon or Bander-Abaſſi, *i. e.* the port of Abbas; the moiety of the cuſtoms of which port he granted the Engliſh for their good ſervice. Gambroon, however, is far from being what Ormus was. When Ormus was loſt by the Portugueſe, it was computed, that excluſively of jewels and rich merchandiſe, the plunder and ready money amounted to more than two millions. The Portugueſe afterwards made an attempt for the recovery of Ormus, but were diſappointed in conſequence of failure of ſuccour and ſupport from the viceroy of Goa; and the place remained in a ruined ſtate. N. lat. 27° 8′. E. long. 56° 40′.

ORNAMENTS, in *Architecture*, expreſs all the ſculpture, or carved work, with which a piece of architecture is enriched.

Ornaments *in Relievo*, are thoſe carved on the contours of mouldings: as leaves, ſhells, ſcrolls, flowers, &c. See Relievo.

Ornaments *in Creux*, are thoſe cut within the mouldings; as eggs, flutes, &c. See Creux.

Vitruvius and Vignola alſo uſe the word ornament to ſignify the entablature.

Ornaments, *Diſtribution of*. See Distribution.

ORNANO, in *Geography*, a town of the iſland of Corſica, and chief place of a canton, in the diſtrict of Ajaccio; the canton contains 4478 inhabitants.

ORNANS, a town of France, in the department of the Doubs, and chief place of a canton, in the diſtrict of Beſançon; nine miles S.S.E. of it. The place contains 3500, and the canton 13,838 inhabitants, on a territory of 272½ kiliometres, in 28 communes. N. lat. 47° 6′. E. long. 6° 13′.

ORNE, one of the nine departments of the N.W. region of France; compoſed of the ſouth part of Normandy, and almoſt the whole of Perche, is bounded on the N. by the department of the Calvados, on the N.E. by the department of the Eure, on the E. by the department of the Eure and Loire, on the S. by the departments of the Sarte and the Mayenne, and on the W. by the department of the Channel, in N. lat. 48° 10′; 32 French leagues in length, and 15 in breadth; containing 6375 kiliometres, or 310 ſquare leagues, and 397,931 inhabitants. It is divided into four diſtricts, or circles, 35 cantons, and 627 communes. The circles are Domfront, including 110,526, Argentan, 106,495, Alençon, 67,372, and Montagne, 113,538 inhabitants. According to Haſſenfratz, the circles are ſix, the cantons 51, and the number of inhabitants 348,972. The contributions in the 11th year of the new era amounted to 3,666,903 fr. and the expences to 535,186 fr. 33 cents. The capital is Alençon.

This department is traverſed from E. to W. by a ridge of hills partially covered with foreſts, and contains many tracts of an indifferent ſoil, yielding grain, flax, hemp, and paſtures. Here are iron mines and mineral ſprings.

ORNES, a town of France, in the department of the Meuſe; ſix miles N.N.E. of Nerdun.

ORNITHIÆ, a name given by the ancients to certain winds, which uſually blew in ſpring, at the time when the birds of paſſage came over to them. Pliny ſays, that theſe winds blew from the weſt, and that, by ſome, the Eteſian winds were called by this name. Others ſuppoſe that they blew from the north, or north-weſt.

ORNITHOGALUM, in *Botany*, an ancient name, adopted by the Latins from the Greeks, evidently derived from ορνις, ορνιθος, *a bird*, and γαλα, *milk*; but its application has proved a ſtumbling block to moſt etymologiſts. Ambroſinus preſumes the word may allude, either to the ſhining milky white of the flowers, like that of a hen's egg; or to the white egg-ſhaped bulbs. Tournefort ſuppoſes the flowers, being green when cloſed, and white when expanded, may have been compared to the wings of ſeveral birds. Linnæus firſt gave the true explanation, in ſuggeſting, (*Mant.* 364. *Prælect. in Ord. Nat.* 287), that the *O. umbellatum* appears to be the "doves' dung," mentioned in the 2d book of Kings, chap. vi. v. 25, as having fetched ſo high a price during the ſiege of Samaria. It is recorded by the ſacred writer, that a quarter of a cab of dove's dung then ſold for five pieces of ſilver; and the rabbinical commentators, taking the words literally, have aſſerted, abſurdly enough, that it was uſed as fuel. As the plant grows copiouſly in Paleſtine, whence the Engliſh name, ſtar of Bethlehem, and the roots are ſtill in common uſe for food in that country, the name is explained by the reſemblance in the colours of the flower to the dung of birds, the white or milky part of which, their urine, is contraſted with dull green, exactly as in the petals of this original ſpecies of the genus before us, and which appears to be the very one deſcribed by Dioſcorides. The writer of the preſent article had the ſatisfaction of finding this, his own explanation of the matter, had previouſly occurred to Linnæus.—Linn. Gen. 166. Schreb. 221. Willd. Sp. Pl. v. 2. 111. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 362. Prodr. Fl. Græc. Sibth. v. 1. 229. Ait. Hort. Kew. ed. 2. v. 2. 256. Tournef. t. 203. Juſſ. 53. Lamarck Dict. v. 4. 612. Illuſtr. t. 242. Gærtn. t. 17.—Claſs and order, *Hexandria Monogynia*. Nat. Ord. *Coronariæ*, Linn. *Aſphodeli*, Juſſ.

Gen. Ch. *Cal.* none. *Cor.* Petals fix, lanceolate, their lower half erect; upper ſpreading; permanent, fading. *Stam.* Filaments ſix, erect, alternately dilated at the baſe, ſhorter than the corolla; anthers ſimple. *Piſt.* Germen angulated; ſtyle awl-ſhaped, permanent; ſtigma obtuſe. *Peric.* Capſule ſuperior, roundiſh, angulated, of three cells and three valves. *Seeds* ſeveral, roundiſh.

Obſ. In ſome ſpecies the filaments are flat and erect, the alternate ones trifid at the top, their middle point bearing

bearing the anther; in others the alternate filaments are ſimple.

Eſſ. Ch. Corolla of ſix petals, erect, permanent, their upper part ſpreading. Filaments dilated at the baſe. Capſule ſuperior, of three cells. Seeds roundiſh, naked.

Obſ. Of this beautiful and extenſive genus the 14th edition of *Syſtema Vegetabilium* mentions only 22 ſpecies, diſtributed into two ſections; firſt ſuch as have all their ſtamens awl-ſhaped; ſecondly, ſuch as have the alternate ſtamens emarginate. But this arrangement is aboliſhed in Willdenow who gives 43 ſpecies, and in the 2d edition of *Hortus Kewenſis*, where 24 are mentioned. We ſhall ſelect ſeveral for the ſake of illuſtration, two of which, *arvenſe* and *nanum*, are not in Willdenow.

O. *uniflorum*. One-flowered Star of Bethlehem. Linn. Mant. 62. Laxm. in Nov. Comm. Petrop. v. 18. 529. t. 6. f. 3.—Stem with two approximated leaves. Flower ſolitary. Outer petals lanceolate, abrupt; inner twice as broad, elliptical. Found on the ſummits of ſome hills in Siberia. It flowers at Kew in May and June. This ſpecies greatly reſembles *O. luteum* in herbage, but the *flower* is ſolitary, and thrice as large, with broad *petals*, approaching to our *Melanthium flavum*. (See MELANTHIUM.) The *ſtem* is almoſt a ſpan high, bearing two lanceolate leaves, nearly oppoſite. *Petals* yellow above, green below, an inch long or more.

O. *ſpathaceum*. Sheathed Star of Bethlehem. Hayne in Uſt. Annal. faſc. 21. 11. t. 1. Willd. n. 4. Sm. Fl. Græc. Sibth. t. 331, unpubliſhed. (O. minimum; Fl. Dan. t. 612.)—Corymb ſimple, of few flowers, on ſmooth ſtalks. Bracteas lanceolate, ſlightly fringed. Leaves linear.—Native of the Levant, as well as of Germany and Denmark.—A ſmall ſpecies, with two linear, very ſlender, radical *leaves*; broad *bracteas*, one of them far below the *corymb*, and never more than three *flowers*, whoſe narrow obtuſe *petals* are yellow above, green beneath. The figure in *Fl. Dan.* makes them by far too broad and pointed.

O. *arvenſe*. Yellow Field Star of Bethlehem. Perſoon in Uſt. Annal. faſc. 11. 8. t. 1. f. 2. Sm. Fl. Græc. t. 332, unpubliſhed. (O. anguſtifolium bulbiferum; Tourn. Inſt. 379.)—Corymb compound, many-flowered, downy. Bracteas lanceolate, fringed. Leaves linear.—Frequent in the Levant.—Much larger than the laſt, with the numerous *flower-ſtalks*, and under ſide of the *petals*, downy. There are many ſmall partial *bracteas*.

O. *luteum*. Common Yellow Star of Bethlehem. Linn. Sp. Pl. 439. Engl. Bot. t. 21. Fl. Dan. t. 378.—Stalk angular, with a linear leaf at its baſe. Flower-ſtalks umbellate, ſmooth, undivided. Petals lanceolate.—Occaſionally found early in the ſpring, about woods and paſtures in Oxfordſhire, Yorkſhire, and ſome other parts of England, as well as on the continent. The *ſtem*, or rather *ſtalk*, is triangular, near a ſpan high. *Leaves* keeled, linear-lanceolate, radical, and moſtly ſolitary. *Bracteas* two, unequal, fringed, broadiſh. *Umbel* ſmooth, of ſeveral *flowers*, coloured as in the two foregoing.

O. *nanum*. Dwarf White Star of Bethlehem. Sm. Prodr. Fl. Græc. Sibth. v. 1. 230. Fl. Græc. t. 333, unpubliſhed. (O. humifuſum, floribus umbellatis albis; Buxb. Cent. 2. 35. t. 37. f. 1.)—Corymb ſimple, ſmooth, longer than its ſtalk, of few flowers. Bracteas inflated, membranous. Leaves linear, numerous.—Gathered by Dr. J. Sibthorp in Arcadia, as well as near Abydos, flowering in March. The *bulb* is as big as a hazel-nut. *Leaves* ſix or more, widely ſpreading, ſix inches long, narrow, rather glaucous. *Stalk* very ſhort, bearing two or three large, erect, white *flowers*, ribbed with green, three of whoſe *ſtamens* are dilated at the baſe.

O. *umbellatum*. Common Star of Bethlehem. Linn. Sp. Pl. 441. Engl. Bot. t. 130. Jacq. Auſtr. t. 343. Redout. Liliac. t. 143.—Corymb ſimple, many-flowered, its lower ſtalks riſing above the reſt. Filaments tapering, entire.—Not unfrequent in meadows, paſtures and groves in England, flowering in April and May. Dr. Sibthorp found it abundantly in the fields of Greece, nor does this ſpecies ſeem to be rare throughout the Levant. It is unqueſtionably the ὀρνιθογαλον of Dioſcorides, and we have already explained that name. With us it is frequent in gardens, conſpicuous in the ſpring for its large umbel-like *corymb* of ſhining white ſtarry *bloſſoms*, green at the back. The *roots* are eaten boiled, chiefly by poor people, in the Levant.

O. *pyrenaicum*. Spiked Star of Bethlehem. Linn. Sp. Pl. 440. Engl. Bot. t. 499. Jacq. Auſtr. t. 103. Redout. Liliac. t. 234.—Cluſter very long. Petals linear, obtuſe. Filaments all dilated. Style the length of the ſtamens. Partial flower-ſtalks equal, ſpreading; ſubſequently erect.—Native of mountainous paſtures in many parts of Europe, rare in England, flowering in June and July. The *leaves* are radical, very long, furrowed. *Stalk* round, about three feet high, erect. *Flowers* very numerous, ſmall, greeniſh, by no means ornamental. *Stamens* all of equal length.

O. *nutans*. Drooping Star of Bethlehem. Linn. Sp. Pl. 441. Engl. Bot. t. 1997. Curt. Mag. t. 269. Jacq. Auſtr. t. 301. Fl. Dan. t. 912. Redout. Liliac. t. 253.—Flowers pendulous toward one ſide. Filaments dilated, cohering, bell-ſhaped; three of them longer and cloven.—The original place of growth of *O. nutans* is doubtful; but Dr. Smith thinks it ſo far naturalized in this country as to be admiſſible into the Britiſh catalogue. The ſpecimen figured in Engliſh Botany grew near Bury in Suffolk, where it flowers in great profuſion early in May. *Bulb* large, commonly deep in the ground. *Leaves* all radical, pale, and ſomewhat glaucous, linear, channelled, acute. *Stalk* ſolitary, rather taller than the leaves, cylindrical, erect. *Cluſter* ſimple, a little drooping, compoſed of ſeven or eight large, elegant, greeniſh, ſilvery-white *flowers*, which lean towards one ſide, and as they fade become pendulous.

O. *lacteum*. Large Milk-white Star of Bethlehem. Willd. n. 14. Jacq. Ic. Rar. t. 434. Curt. Mag. t. 1134.—Cluſter long, denſe. Filaments awl-ſhaped, the alternate ones ſlightly dilated. Bracteas membranous, ovate. Leaves lanceolate, acute, fringed.—Native of the Cape of Good Hope, requiring with us the ſhelter of a frame. It blooms in ſummer, and is conſpicuous for its numerous, crowded, large *flowers*, whoſe ovate *petals* are white on both ſides, though greeniſh at the baſe. The *leaves* are about a foot long and an inch broad.

O. *arabicum*. Great-flowered Star of Bethlehem. Linn. Sp. Pl. 441. Herb. Linn. Curt. Mag. t. 728. Redout. Liliac. 63.—Corymb many-flowered. Filaments awl-ſhaped. Corolla widely bell-ſhaped. Outer petals with three ſlight blunt teeth.—Native of Egypt and Madeira, long ſince introduced into our gardens, where it flowers, though very rarely, in the frame in March and April. The *leaves* are numerous, ſpreading, green. *Stalk* above a foot high, bearing an hemiſpherical *corymb* of many very large, fragrant, white *flowers*, furniſhed with a dark-green *germen*.

ORNITHOGALUM, in *Gardening*, contains plants of the bulbous-rooted, flowery, herbaceous, perennial kinds, of which the ſpecies cultivated are: the umbelled ſtar of Bethlehem (O. umbellatum); the yellow ſtar of Bethlehem (O. luteum);

(O. luteum); the ſmall ſtar of Bethlehem (O. minimum); the Pyrenean ſtar of Bethlehem (O. pyrenaicum); the broad-leaved ſtar of Bethlehem (O. latifolium); the pyramidal ſtar of Bethlehem (O. pyramidale); the one-leafed ſtar of Bethlehem (O. unifolium); the Neapolitan ſtar of Bethlehem (O. nutans); the Cape ornithogalum (O. capenſe); and the golden ſtar of Bethlehem (O. aureum.)

*Method of Culture.*—All the ſorts are capable of being increaſed by planting the ſtrong off-ſets from the old roots in the latter end of the ſummer ſeaſon, when their leaves and ſtems begin to decay, either in beds or the borders; the old roots may either be immediately replanted or kept out of the ground ſome time, but they flower much ſtronger when put into the ground in autumn, than if kept out till the ſpring. The ſmall off-ſet bulbs ſhould be planted out in nurſery rows in beds for ſome time, till ſufficiently large to be finally ſet out where they are to grow. They ſhould have a light ſandy ſoil, little manured.

They afterwards require the ſame management as other hardy bulbs, but they ſhould be removed every other year, as when let remain longer they become weak. See BULB.

The two laſt ſorts ſhould have the off-ſets or ſlips planted in ſeparate pots, at the ſame time with the above, filled with good light earth, placing them under a hot-bed frame, ſo as to be protected from wet during the winter ſeaſon, giving them full air in the ſummer. The old roots may be taken up in the autumn as in the other ſorts, and after being kept a little while out of the ground, be replanted in the beginning of the autumn.

The hardy ſorts are all highly ornamental among other flowering bulbous-rooted plants, in the borders, clumps, &c.

And the two laſt kinds afford variety in the collections of potted plants of the flowering bulbous-rooted ſorts.

ORNITHOGLOSSUM, in *Botany*, is ſo denominated from ορνις, *a bird*, and γλωσσα, *a tongue*, on account of the ſhape of the petals. Salif. Parad. 54. Ait. Hort. Kew. ed. 2. v. 2. 327. Claſs and order, *Hexandria Trigynia.* Nat. Ord. *Tripetaloideæ*, Linn. *Junci*, Juſſ.

Gen. Ch. *Cal.* none, unleſs the corolla be taken for ſuch. *Cor.* Petals ſix, lanceolate, inferior, ſeſſile, ſpreading, equal, permanent, with a nectariferous depreſſion in the baſe of each. *Stam.* Filaments ſix, inſerted into the receptacle, awl-ſhaped, ſhorter than the corolla, unconnected with it, deciduous; anthers roundiſh-heartſhaped. *Piſt.* Germen ſuperior, roundiſh, furrowed; ſtyles three, divaricated, ſlender, the length of the ſtamens, deciduous; ſtigmas bluntiſh. *Peric.* Capſule ovate, with three furrows, three cells and three valves. *Seeds* ſeveral, ovate, ranged in two rows along the edges of each partition.

Eſſ. Ch. Calyx none. Petals ſix, equal, ſeſſile, permanent. Stamens inſerted into the receptacle, deciduous. Styles deciduous. Capſule of three cells, with many ſeeds.

Obſ. We have already alluded to this genus; ſee the obſervations under the generic character of MELANTHIUM. The only ſpecies known to us is,

1. O. *viride.* Ait. as above. (O. glaucum; Saliſ. Parad. t. 54. Melanthium viride; Thunb. Prodr. 67. Linn. Suppl. 213. Willd. Sp. Pl. v. 2. 269. Andr. Repoſ. t. 233.) —Native of the Cape of Good Hope, from whence it was ſent to Kew by Mr. Maſſon, in 1788. It flowers in the greenhouſe in October or November. *Root* tuberous, perennial, annually proliferous at the ſummit. *Stem* obliquely aſcending, by a taper baſe, under ground, then erect and leafy, two or three inches high. *Leaves* ſheathing, alternate, ſpreading, lanceolate, entire, rather glaucous, ſmooth, hollow, the upper ones ſmall. *Flowers* axillary, ſolitary, on long ſtalks which are tumid at the top. *Petals* dull purple, with a glaucous tinge, channelled. There can be no doubt of Mr. Andrews's ſynonym, though he repreſents the leaves as not glaucous.

ORNITHOGLOSSUM, or *Lingua avis*, has alſo been uſed, by ſome authors, as a name for the ſeed of the aſh.

ORNITHOLOGY, is a word derived from the Greek ορνις, *a bird*, and λογος, *a diſcourſe*, and denotes that branch of natural hiſtory which conſiders and deſcribes birds, their natures and kinds, their form, external and internal, and teaches their economy and uſes. On many of theſe particulars we have treated at large under the word BIRDS, *Anatomy of*; to which we refer the reader, as we do alſo to the ſeveral genera in their alphabetical order. Birds have been defined as two-footed animals, covered with feathers, and furniſhed with wings. Like quadrupeds and the cetaceous tribe, they have warm blood, a heart with two ventricles and two auricles, and lungs for the purpoſe of reſpiration. They are, however, diſtinguiſhed from both by their feet, feathers, wings, and horny bill, as well as by the circumſtance of their females being oviparous.

*Hiſtorical View and Claſſification of Ornithology.*—Of the hiſtory of this department of ſcience much has been written; we ſhall confine ourſelves to a few particulars. Among the ancients we may notice the writings of Ariſtotle and Pliny. The former compoſed no particular treatiſe on birds, but he refers to them generally in ſeveral parts of his "Hiſtory of Animals." He enumerates the different kinds of nouriſhment adapted to different ſpecies, and their various modes of feeding: he has alſo given an imperfect nomenclature, and remarks on the diverſified modes of mdification, and ſome intereſting obſervations on the family of eagles. Pliny's deſcription of the feathered race is contained chiefly in his tenth book, but it is not at all preciſe, and is mixed with abſurdity and much fabulous matter. Among the more modern ornithologiſts, ſome have directed their labours to method and claſſification: ſome have treated of the whole claſs; others of particular portions of it: ſome have been contented to define and deſcribe, and others have taken vaſt pains to illuſtrate what they have written by deſigns, not always very accurate, from living or prepared ſpecimens. This combination of the effects of the pen, the pencil, and graver, which has ſo eminently contributed, in our day, to the acquiſition and diffuſion of knowledge, ſeems to have been unknown to the ancients.

Among thoſe who firſt excited a taſte, on the continent, for the ſtudy of ornithology, and for a methodical diſtribution of that portion of ſcience, may be mentioned Peter Belon, who flouriſhed in the middle of the 16th century, and who travelled from the laudable deſire of collecting information, which, as we have ſeen in his article, he communicated to the world in various works. (See BELON.) His Hiſtory of Birds, which is a thin volume, divided into ſeven parts, and illuſtrated by wooden cuts, was publiſhed in 1555 at Paris. The principle of claſſification which he adopts, is chiefly founded on the circumſtances of habitation and food, and only occaſionally on external forms and characters: it is accordingly very defective. His deſcriptions are tolerably accurate, but the figures are ſaid to be very inadequate repreſentations of the originals. It is however ſaid, "that he frequently ſuggeſts judicious views of his ſubject; that he notes with ingenuity the points of reſemblance between the human ſkeleton and that of birds, and that he has penned ſeveral paſſages which may be ſtill peruſed with intereſt and inſtruction."



The

The next perſon in order to be noticed is the celebrated Conrad Geſner, of whom our readers will find a full account in the article already devoted to his labours as a naturaliſt and phyſician. He was a contemporary of Belon, and has aſſigned the third volume of his hiſtory of animals to the department of ornithology. It contains much learning, and exhibits alphabetical tables of the names of birds, in Hebrew, Chaldee, Arabic, Greek, Latin, and moſt of the ſpoken languages. His deſcriptions are chiefly compilations made by abridgments, but his references at the cloſe of each article are numerous, and ſhew that his ſtudies were extenſive, and his knowledge very general. The arrangement of this naturaliſt is that made according to alphabetical order.

The ſame topics are diſcuſſed by Ulyſſes Aldrovandus, or Aldrovandi, a learned phyſician, who, as we have ſeen, vol. i. was denominated the modern Pliny; who availing himſelf of the writings of Belon and Geſner, added greatly to their ſtores, and compiled three folios, divided into twenty books, illuſtrated by wood-cuts. His catalogue compriſes but few birds, excepting ſuch as are natives of Europe. He is ſaid to adopt too implicitly the vague diſtinctions of Belon, to copy too ſervilely from Ariſtotle, and to overſpread his borrowed materials with a maſs of dark commentary. See ALDROVANDI.

Mr. John Johnſton, mentioned in the 19th volume of the New Cyclopædia, publiſhed a thin folio on this ſubject, but he did little more than condenſe the compilations of Geſner and Aldrovandus. In his work he divides the whole claſs of birds into land and water-fowls, and deduces his ſubordinate diviſions from the nature of their aliments. His deſcriptions are well ſpoken of as correct, but ſcanty, and even his figures, though traced with more character than thoſe of his predeceſſors, exhibit much parſimony of engraving.

The next writers of eminence in this branch of zoology were our countrymen Francis Willoughby, or Willughby, eſq. and Mr. Ray. The former laid the foundation of a more accurate arrangement: he obſerved that the hiſtory of animals had in a great meaſure been neglected, and accordingly he made the ſtudy of that his province, and the illuſtration of it his chief and moſt delightful employment. With this view he travelled into foreign countries, with his friends Mr. Ray, ſir Philip Skippon, and other gentlemen, in the year 1663 and 4, on purpoſe to ſearch out and deſcribe the ſeveral ſpecies of animals, beaſts, fiſhes, and inſects. Though he was but a ſhort time abroad, yet he travelled over moſt parts of France, Spain, Italy and Germany, in all which places he was ſo diligent and ſucceſsful, that not many ſorts of animals, deſcribed by others, eſcaped his obſervation. He drew them with a pencil, and afterwards the birds were curiouſly engraved on copper plates, at the charge of his widow, and printed with his ornithology, under the title of "Franciſci Willoughbeii de Middleton, Armigeri, e Reg. Soc. Ornithologiæ Libri tres, in quibus Aves omnes hactenus cognitæ, in Methodum naturis ſuis convenientem redactæ, accurate deſcribuntur: Deſcriptiones iconibus elegantiſſimis et vivarum Avium ſimillimis, æri inciſis, illuſtrantur. Totum opus recognovit, digeſſit, ſupplevit, Joh. Raius." Mr. Ray made conſiderable additions and improvements to Mr. Willoughby's materials, and afterwards tranſlated it into Engliſh, and cauſed it to be printed in 1678. This work of Mr. Willoughby is divided into three books, which are ſubdivided into chapters. In theſe he treats of the form and external ſtructure of birds, of their organiſation and internal ſtructure. In one part are included twenty-four queries, the anſwers to which, if founded in fact, and drawn up with judgment, would not fail greatly to contribute to the advancement of ornithology. The author recognizes the grand diviſion of terreſtrial and aquatic birds, compriſing under the former thoſe which live at a diſtance from water, and under the ſecond thoſe which live on the margin, or ſurface of that element. He then inſtitutes his leading diſtinction from the form of the bill and feet, and would doubtleſs have accompliſhed a complete arrangement had he uniformly adhered to the ſame principle; but, in compliance with the prejudices of his time, he aſſumes the different kinds of food, the varieties of ſize, the nature of the fleſh, and even what he called the moral qualities, as the grounds of ſubdiviſions. His ſecond and third books contain the deſcription and hiſtory of the ſpecies. To the expoſition of each genus are prefixed general obſervations, including the fabulous accounts of the ancients, and then ſuch common properties as appertain to the genus. The author then proceeds to the ſpecific details, ſtating the moſt important particulars with preciſion, and finiſhes with an account of peculiar habits. Mr. Ray drew up a Synopſis of Birds and Fiſhes, which was publiſhed after his death by Dr. Derham, with the title "Joannis Raii Synopſis methodica Avium et Piſcium; Opus poſthumum, quod vivus recenſuit et perfecit ipſe inſigniſſimus Autor: in quo multas ſpecies, in ipſius Ornithologiâ et Ichthyologiâ deſideratas, adjecit, &c. Iconibus." The figures here referred to are contained in four plates, of which two repreſent Indian birds about Fort St. George, and the others fiſhes diſcovered on the coaſts of Cornwall, by the Rev. George Jago. In the Synopſis the author follows, with a few exceptions, the method of Willoughby, referring at the ſame time to the tail, feathers, and ſome parts of the internal conformation.

Jacob Theodore Klein publiſhed at Lubeck, in 1750, a quarto volume, entitled "Hiſtoriæ Avium Prodromus cum prefatione de ordine animalium in genere." In this work he divides birds into families, orders, and tribes. According to his ſyſtem the eight families are diſtinguiſhed by the conformation of the feet: the orders by the form of the bill: and the tribes ſometimes by the form and proportions of the head, and ſometimes by accidental differences of the bill. Two years after the publication of Klein, we had the ſcientific catalogue of Mœhring, phyſician to the prince of Anhalt. His claſſes, orders, and genera, are founded on the formation of the feet and bill; and his deſcriptions of birds, examined by himſelf, are thought to be very accurate; but for want of a diſcriminating judgment, he is miſled by the errors of others.

Of our great naturaliſt Linnæus we ſhall ſpeak hereafter: to him has been aſſigned the date of 1766, the year in which he publiſhed the 12th edition of his Syſtema Naturæ.

M. Salerne, a phyſician of Orleans, left behind him a manuſcript treatiſe on ornithology, which was publiſhed by his friends. He follows Mr. Ray's method, but the hiſtorical part is from the pen of Salerne. The typography is executed with neatneſs and elegance, and the plates, thirty-one in number, are engraved with uncommon ſkill.

The Syſtem of Ornithology by M. Briſſon, in French and Latin, is compriſed in ſix volumes, quarto. He diſtributes birds into 26 orders, inſtituted from the form of the feet, bill, &c.; 115 genera, which are determined by the peculiarities of the bill or mandibles, and about 1300 ſpecies. Each article is preceded by a numerous and accurate liſt of references and figures; many ſpecies, till then undeſcribed, are particularized; and the work is illuſtrated with more than 220 excellent engravings. The principal merit of

Briſſon's plan conſiſts in the adoption of external and permanent characters, which enable the ſtudent to aſſign the name and ſtation of a bird which he ſees for the firſt time. This work is ſaid to be equally accurate with that of Willoughby, and much more copious; and though not free from errors, holds a reſpectable rank in the library of the ornithologiſt.

The Natural Hiſtory of Birds by the Comte de Buffon, and his learned friends, is defective in arrangement, but the ſtyle of the work is popular, luminous, and even elegant, and the plates add greatly to its value. "It poſſeſſes many qualities that recommend it to public attention: it exhibits a clear and comprehenſive view of the knowledge to be acquired in ornithology, ſcattered through a multiplicity of volumes, and in various languages: it diſcuſſes and elucidates, with much critical accuracy, the numerous controverted points: it reduces the whole to ſimplicity, order, and elegance; and by large additions of valuable matter, it greatly extends the bounds of the ſcience." Such is the opinion of the tranſlator reſpecting the value of M. Buffon's Natural Hiſtory. Although the whole work commonly goes under the name of Buffon, yet he derived very important aſſiſtance from his friends. The learned and eloquent M. Gueneau de Montbeillard compoſed the greater part of the two firſt volumes of the Hiſtory of Birds, which appeared, in 1771, under the name of M. de Buffon, and the public did not diſcover the difference of ſtyle which might have been expected in the writings of different authors. It was, however, thought proper to throw off the maſk, and in the ſubſequent volumes each author prefixed his name to his own articles. The third volume was nearly completed when new aſſiſtance was received from the communications of the celebrated Bruce, who on his return from his travels paſſed ſome days with M. de Buffon at Paris. Sonnini's edition of Buffon's Natural Hiſtory contains many valuable additions, and forms, perhaps, one of the moſt complete works of the kind that has yet appeared. In the ornithological department, it gives deſcriptions and figures of every bird to which the editors could have acceſs, either in the living or preſerved ſtate, or of which they could obtain good drawings.

The ornithology of the Encyclopédié Methodique, by M. Mauduyt, is celebrated on account of the preliminary diſcourſes, the accuracy of the deſcriptions and references, and the correct execution of the plates. In the year 1773 Mr. Pennant publiſhed a ſmall volume, entitled "Genera of Birds." In the preface to this work he enters into a minute account of the external parts of birds, their feathers, flight, modification, &c. With reſpect to the ſyſtematic arrangement he gives a decided preference to that of Ray, which he ſays is ſo judicious, that it appears ſcarcely poſſible to make any change in it for the better. In ſpeaking of the Linnæan claſſification, he ſays; "I permit the land-fowl to follow one another, undivided by the water-fowl, the Grallæ and Anſeres of his ſyſtem; but in my generical arrangement, I moſt punctually attend to the order he has given in his ſeveral diviſions, excepting in thoſe of his Anſeres and a few of his Grallæ. For, after the manner of Briſſon, I make a diſtinct order of water-fowl with pinnated feet, placing them between the waders, or cloven-footed water-fowl, and the web-footed. The oſtrich, and land-birds with wings uſeleſs for flight, I place as a diſtinct order. The trumpeter, or Pſophia of Linnæus, and the buſtards, I place at the end of the gallinaceous tribe: all are land-birds; the firſt multiparous, like the generality of the gallinaceous tribe; the laſt granivorous, ſwift runners, avoiders of wet places; and both have bills ſomewhat arched. It muſt be confeſſed, that both have legs naked above the knees; and the laſt, like the waders, lay but few eggs. They ſeem ambiguous birds, that have affinity with each other, and it is hoped that each naturaliſt may be indulged the toleration of placing them as ſuits his own opinion."

In 1781 Mr. Latham commenced his General Synopſis of Birds, a work of much accurate detail, and extending to ſix quarto volumes, with two of ſupplement. He adheres, with few exceptions, to the Linnæan genera, and illuſtrates each genus by one coloured copper-plate engraving, uſual of ſome rare ſpecies. Mr. Latham was likewiſe the author of an "Index Ornithologicus," in two volumes quarto, which forms a convenient appendage to his larger work. The works of this able and induſtrious author conſtitute a precious repoſitory of deſcriptions and facts, and muſt always hold a diſtinguiſhed place in the library of the ornithologiſt. Having ſaid thus much of our own moſt diſtinguiſhed naturaliſts in this department of ſcience, we ſhall give, in a tabular view, their modes of claſſification, that the reader may, with a glance of his eye, almoſt compare them with one another.

| | | | | | | |
|---|---|---|---|---|---|---|
| In the Linnæan ſyſtem there are ſix orders of birds, *viz.* | Accipitres. | According to Pennant there are nine orders, in two diviſions, which anſwer to the ſix of Linnæus, as in the ſubjoined method. | Diviſion I. Land Birds. | Diviſion I. | Order I. Rapacious - | Accipitres. |
| | Picæ. | | | | II. Pies - - | Picæ. |
| | Anſeres. | | | | III. Gallinaceous - | Gallinæ. |
| | Grallæ. | | | | IV. Columbine - | Paſſeres. |
| | Gallinæ. | | | | V. Paſſerine - - | Paſſeres. |
| | Paſſeres. | | | | VI. Struthious - | Gallinæ. Grallæ. |
| | | | Diviſion II. Water Fowl. | Diviſion II. | VII. Cloven-footed, or Waders | Grallæ. |
| | | | | | VIII. Pinnated-feet - | Anſeres. Grallæ. |
| | | | | | IX. Web-footed - | Anſeres. Grallæ. |

which anſwer to the Linnæan

TABLE of the Orders of Birds according to Mr. Latham.

| Ind. Orn. | Syn. of Birds. |
|---|---|
| Div. I. | Div. I. |
| I. Accipitres - - | Rapacious. |
| II. Picæ - - - - | Pies. |
| III. Paſſeres - - - | Paſſerine. |
| IV. Columbæ - - | Columbine. |
| V. Gallinæ - - - | Gallinaceous. |
| VI. Struthiones - - | Struthious. |
| Div. II. | Div. II. |
| VII. Grallæ - - - | Waders. |
| VIII. Pinnatipedes - - | Pinnated-feet. |
| IX. Palmipedes - - | Web-footed. |

For another mode of claſſification we refer our readers to the eighth volume of this work, under the title CLASSIFICATION *of Animals for Comparative Anatomy*. It is not neceſſary in this place to enumerate the genera under their reſpective orders, inaſmuch as they differ but little in the ſeveral ſyſtems. It may, however, be obſerved, that the Lanius, which by Linnæus is placed laſt among the Accipitres, is by Pennant and Latham put firſt among the Picæ: the genera Struthio and Didus, arranged with the order Gallinæ in the Linnæan ſyſtem, make a diſtinct order with Pennant, entitled Struthious; whereas Latham conſiders them only as part of an order, with which he claſſes, as ſeparate genera, the Caſſuarius or caſſowary, and the Rhea, or American oſtrich, which, as will be ſeen hereafter, are but ſpecies of the genus Struthio, in the Linnæan method. Again, Pennant and Latham devote their fourth order to the genus Columba of Linnæus, who conſiders it only one of ſeventeen of the Paſſerine tribe. So that, as is ſeen in the table, the order Paſſeres of Linnæus includes the Columbine and Paſſerine orders of the other naturaliſts, who likewiſe include the Gallinæ of Linnæus in their Gallinaceous and Struthious, and the Grallæ are likewiſe divided among four of their orders, ſome being placed with the Struthious; ſome with the Waders; ſome with thoſe that have Pinnated-feet; and ſome among the Web-footed. The reaſon of theſe changes is obvious: the Swediſh naturaliſt diſtinguiſhes his orders chiefly by the form of the *bill*, but our countrymen ſeparate them from one another according to the characteriſtic form of their feet. It may be farther obſerved, that Pennant makes no diſtinction in his ninth order, the web-footed birds, but Latham divides them into two ſections, *viz.* thoſe with *long*, and thoſe with *ſhort* legs, in the former he places the Recurviroſtra, the Currira, and the Phœnicopterus. Pennant, in his Ornithology, divides all birds into 95 genera, but Latham makes 101, whereas Linnæus includes them all in 90 genera.

Such are the outline of, and diſtinction between, the ſeveral ſyſtems uſually referred to as ſtandards in this country, and which, on that account, we have been particular in explaining.

We may now briefly mention ſome other writers in this branch of ſcience. Francis Hernandez, a Spaniſh phyſician, of whom we have in the proper place given an account, deſcribed the birds of Mexico. His work conſiſts of 229 chapters, each of which generally treats of a ſingle ſpecies. They are deſignated only by their Mexican names, and deſcribed with ſo much brevity, that their preciſe ſtations in the Linnæan arrangement can ſcarcely be aſcertained. The ſame objections apply with equal force to a work of Nieremberg, who has deſcribed the birds of the ſame country. From both, however, it has been inferred, that the feathered tribes in Mexico are numerous, and diverſified with the moſt brilliant colouring. The birds of Brazil preſent a ſtill more rich and ſplendid field for the reſearches of the ornithologiſt, and of theſe a great number have been deſcribed by George Marcgrave, or, as he is deſignated in our 22d vol. MARCGRAF: but whatever he may have been as a delineator of botanical ſubjects, his plates in ornithology are badly executed, and very frequently they do not correſpond with the deſcriptions. See MARCGRAVIA.

Sir Hans Sloane, who was the aſſociate and friend of Boyle and Ray, publiſhed in 1707 the firſt volume of his Hiſtory of Jamaica, but the ſecond did not make its appearance till the year 1725. In this hiſtory he has given repreſentations of 44 ſpecies of birds, but no great reliance can be placed on the accuracy of his delineations.

Mr. Mark Cateſby, of whom we have given a pretty full account in the 7th volume of the Cyclopædia, publiſhed an excellent deſcription of the birds of Carolina, Florida, and the Bahama iſlands, in French and Engliſh: it makes a large portion of "The Natural Hiſtory, &c." referred to in the article already noticed: the firſt volume, and part of the appendix to the ſecond, are devoted to ornithological ſubjects. The deſcriptions are conciſe and perſpicuous, and accompanied with ſome intereſting notices relative to the manners and habits of the ſpecies deſcribed. The plates, which are numerous, are generally faithful repreſentations of the originals, and admirably coloured.

Schwenckfel, who publiſhed his Natural Hiſtory of Siberia in the year 1603, includes birds in his fourth book. The introduction to this work is followed by the enumeration of birds in alphabetical order, according to their Latin names. His deſcription of the parts which belong to birds in common with other animals, and of the appropriate parts of the organization of the former, are neat and accurate, but his differences, founded on habitation and food, are not at all to be depended upon. "The deſcriptions, though accurate, are for the moſt part too ſhort, and though adequate to recall a bird already known, are not ſufficient to convey a preciſe notion of thoſe which are deſcribed for the firſt time."

M. Brunnick, in 1764, publiſhed an account of the birds of Denmark, and the neighbouring iſlands and provinces, but he chiefly dwells on the rare and non-deſcript ſpecies. He generally follows the Linnæan nomenclature, and ſometimes the ſynonymy of Briſſon.

M. Sonnerat publiſhed, in 1776, an account of his voyage to New Guinea, the Molucca, and the Philippine iſlands, the Iſle of France, &c. and in 1783 he gave a narrative of his ſecond voyage to ſeveral parts of the Eaſt Indies and China. This very intelligent traveller exhibits a conſiderable ſhare of accuracy and taſte; and beſides correcting the errors of thoſe who had preceded him, he has noticed a conſiderable number of birds for the firſt time, and moſt of them remarkable for their ſingularity and beauty. His account of the wild cock and hen, the origin of our common domeſtic fowls, is a very intereſting article.

John Leonard Friſch, a German naturaliſt, was, as we have ſeen, author, among many other works, of one entitled, "A Repreſentation of the Birds of Germany, with a few of foreign Countries, coloured after Nature." This work conſiſts chiefly of European birds, arranged in twelve claſſes according to diſtinctions, which are far from preciſe and convenient. In addition to what has been ſaid in the article FRISCH, (which ſee,) may be added, that the figures are, for the moſt part, accurate and lively repreſentations from nature, though, in a few inſtances, they are larger than life. The author has beſtowed uncommon pains on the different colourings of the two ſexes of the ſame ſpecies.

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M. le Vaillant, author of A Voyage to the Cape, and of the "Natural Hiſtory of Birds of Africa," is eminently diſtinguiſhed by the ardour and acuteneſs with which he has proſecuted his ornithological reſearches, and has availed himſelf with laudable diligence of his opportunities of collecting accurate details relative to the ſeveral ſpecies which he undertakes to illuſtrate. His "Natural Hiſtory of the Birds of Paradiſe, Rollers, Toucans, and Barbets," is reckoned the moſt ſplendid publication that has appeared in any of the departments of ornithology. His work is thus deſcribed; "The figures, about 100 in number, are engraved by Pèrèe, from the drawings of Barraband, coloured by Langlois, and retouched by the pencil of the original deſigner; while the elder Didot has executed the typography in his beſt ſtyle, on vellum paper. Each figure is as large as life, and is uſually drawn from a ſpecimen in the higheſt ſtate of preſervation; and in many caſes, an exact repreſentation of the female bird has alſo been obtained. Though the pre-eminent merit of the work conſiſts in the figures and deſcriptions, it is in a few inſtances agreeably diverſified by traits of character which the author remarked in the living bird, and by ſome intereſting hints of a more general complexion, which his accurate and extenſive obſervation enabled him to collect."

M. Anſeline Gaëtan Deſmareſt has given a natural hiſtory of the genera Tanagra, and Pipra of the Paſſerine order: and of the genus Todus in the order Picæ, with coloured plates, from drawings by Paulina de Courcelles, the pupil of Barraband, which reflect great credit on the perſons concerned in ſo ſplendid a work. The paper, type, and figures, all beſpeak the admiration of the reader. The author, Deſmareſt, ſays that they have limited their deſcriptions to ſpecies which they have ſeen, and from which they have been enabled to exhibit figures. Beſides deſcriptions and plates of the male, uſually the moſt beautiful bird, the authors have not unfrequently repreſented the female, or young of the ſame ſpecies, or an individual as it appears in the moulting ſtate.

The natural hiſtory of birds by Mr. George Edwards, in four volumes, 4to., which is without method, and without any reference to particular countries, contains many excellent coloured deſigns, and uſually may be recommended for the correctneſs of the deſcriptions. The ſame obſervation applies to his "Gleanings of Natural Hiſtory," of which the moſt conſiderable portion relates to birds. (See the article Edwards, vol. xii.) Several other writers of our own country have deſcribed and delineated the birds of this iſland with various degrees of merit. The ornithological part of Pennant's Britiſh Zoology, has always been regarded as a work of high authority; and ſome others muſt be barely mentioned before we conclude the hiſtorical part of this article, ſuch are Hayes' "Natural Hiſtory of Britiſh Birds," with their portraits accurately drawn and beautifully coloured fron nature; Lord's "Natural Hiſtory of Britiſh Birds;" Lewin's "Birds of Great Britain," with delineations of their eggs, in three volumes, 4to.; Walcott's "Synopſis of Britiſh Birds," in two volumes, 4to.; a work on "Britiſh Ornithology," by Mr. Graves; Mr. White's "Natural Hiſtory of Selborne;" and Bewick's "Hiſtory of Britiſh Birds," with figures engraved on wood, in two volumes royal octavo, 1805. The diviſion of the laſt mentioned author is into Britiſh Land and Water Birds, to each of which a volume is devoted. To theſe may be added the Ornithological Dictionary, or Alphabetical Synopſis of Britiſh Birds, by Mr. George Montagu, in two volumes, 8vo. In this work a large portion of accurate and important information is brought within a very narrow compaſs.

*External Characters of Birds.*—The ſtructure of birds, and their habits of life, are wonderfully adapted to the various functions which they are deſtined to perform. The pointed beak, the long and pliant neck, the expanſive wings, the tapering tail, the light and bony feet, are all wiſely calculated to aſſiſt and accelerate their motion through the yielding air. Every part of their frame is formed for lightneſs and buoyancy; their bodies are covered with a ſoft and delicate plumage, ſo diſpoſed and arranged, as to protect them from the intenſe cold of the atmoſphere through which they paſs; their wings are formed of the lighteſt materials, and yet the force with which they ſtrike the air is ſo great, as to impel their bodies forward with aſtoniſhing rapidity, while the tail ſerves the purpoſe of a rudder to direct them to the different objects of their purſuit. It is not, however, by the power of flying alone, that birds have been diſtinguiſhed from the other claſſes of animals; a ſpecies of ſquirrel, denominated the Sciurus *volans*, and the bat genus among the Mammalia, and the Exocoetus *volitans*, (which ſee,) or flying-fiſh, are endowed with the ſame faculty, though in a very imperfect degree. On the other hand, birds of the ſtruthious kind, as the dodo and oſtrich, from their great weight, are wholly unable to aſcend into the regions of the air by means of their wings. Still, however, as we have noticed, birds in their characters differ remarkably from other animals in their external ſtructure, as they do alſo in their internal conformation; if they are deſtitute of teeth, lips, external ears, and ſcrotum; ſo likewiſe they have no epiglottis, no diaphragm, nor urinary bladder. (See Bird and Feather.) As the ſlender ſubſtance of feathers is apt to be diſcompoſed by accident, by illneſs, by terror, or by the exceſſive heat or moiſture of the atmoſphere, nature has made an extraordinary proviſion for their adjuſtment and preſervation in a proper temperament. The animals are furniſhed with a gland behind, which ſecretes a proper quantity of oil, that can be preſſed out by the bird's bill, and laid ſmoothly over the feathers which require to be dreſſed. This gland is ſituated on the rump, and furniſhed with an opening or excretory duct, about which a ſmall tuft of feathers grow, ſomewhat like a painter's pencil. When, therefore, the feathers are rumpled, the bird turning its head backward, with the bill catches hold of the gland, and preſſing it, forces out the oily ſubſtance, with which it anoints the disjointed parts of the feathers, and drawing them out places them in due order. Poultry that live for the moſt part under cover, are not furniſhed with ſo large a ſtock of this fluid as thoſe birds that live in the open air. The feathers of a hen are pervious to every ſhower; but ſwans, geeſe, ducks, and all ſuch as live on the water, have their feathers dreſſed with oil from the firſt day of their leaving the ſhell. Next to the feathers, ſo important to the very exiſtence of birds, we naturally conſider the other parts that have been reckoned deſcriptive of the generic characters of birds. The marks derived from the plumage are precarious indications of the ſpecies to which birds belong; the more important characters of them are all taken by Linnæus from the unfeathered parts; as the beak, caruncles, noſtrils, and feet, and in this principle he has been deſervedly followed by many other naturaliſts. The bill in all birds conſiſts of two mandibles, the upper and the lower; the former is uniformly fixed, except in the genus of parrots, which have the power of moving the upper mandible at pleaſure, to aſſiſt in climbing. No birds have teeth, but ſome have ſerrated mandibles, as the toucans and merganſer, (ſee Mergus and Ramphastos,) but the ſerræ are not immerſed in ſockets. In the Falco genus, the baſe of the beak or roſtrum is covered with a ſkin called the *cere*, and

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in the Meleagris, or turkey genus, it is overſpread with a carneous appendage. The noſtrils of birds are generally of an oval form, placed near the baſe of the upper mandible: the organ of ſmell in gannets is ſaid to be wanting, but in moſt birds it is peculiarly acute. The wings of birds in every genus excepting the Struthious, are adapted for flight, which is accompliſhed chiefly by means of the flag-feathers, denominated *remiges*. The largeſt of theſe, named the *primary*, are ſituated on the extremity of the wing, and are generally eight or ten in number; the *ſecondary* are placed nearer the body of the animal; are always ſhorter, and commonly of a different ſhape and colour. There are two ſpecies of the genus Aptenodytes, (ſee PENGUIN,) which are deſtitute of the flag-feathers; with them the wings perform the office of fins, in ſwimming and diving. The larger feathers of the tail have been denominated *rectrices*, from the circumſtance of their being the director or rudder of the animal in flight; for beſides ſerving to counterbalance the fore-parts, they enable the bird to riſe, deſcend, or turn at pleaſure. They ſeldom exceed ten or twelve, except in the Anas genus, in which they are more numerous. See DUCK.

There is a conſiderable difference in the form of their feet, according to their manner of life. Hence the feet have obtained various technical names, as they are fitted for perching, walking, running, ſwimming or diving. For perching, thoſe ſeem beſt adapted which have three toes on the anterior part of the foot, and one backward, with the two outward toes partly connected by a membrane: among walkers this membrane is not to be found. Birds chiefly uſed to ſwimming have their feet wholly palmated, or pinnated, as is the caſe in coots and grebes; or ſemi-palmated, as in the American ſpoon-bill. (See FULICA, COLYMBUS and PLATALEA.) The parrots, woodpeckers, and other genera addicted to climbing, have two toes forwards and two backwards. The oſtrich, the ſwifteſt of all running birds, is in this reſpect anomalous, having only two toes.

Without the means of conveying themſelves with great ſwiftneſs from one place to another, birds could not eaſily ſubſiſt, the food provided for them being ſo irregularly diſtributed, that they are obliged to take long journies to diſtant parts, in order to procure the neceſſary ſupplies. Hence, perhaps, the principal cauſe of thoſe migrations which are ſo peculiar to the feathered race. (See MIGRATION.) It has been ſuppoſed that, during the long flights of birds over immenſe tracts of water, the means of ſubſiſtence would inevitably fail; it ought, however, to be remembered, that this objection is obviated, when we reflect upon the ſuperior velocity with which birds are carried forward in the air, and the eaſe with which they continue their exertions for a much longer time than can be done by the ſtrongeſt quadrupeds. The fleeteſt horſe will ſcarcely run more than a mile in two minutes, and that can be continued for a ſhort time only. In ſuch caſes an uncommon degree of exertion has always been attended with its uſual conſequences, debility, and a total want of power to continue the exertion; but the motions of birds are not impeded by ſimilar cauſes, and they not only glide through the air with a quickneſs ſuperior to that of the ſwifteſt quadrupeds, but can continue on the wing with equal ſpeed for a conſiderable length of time. If we ſuppoſe a bird to go at the rate of a mile in two minutes, and to continue that velocity 24 hours, it will in that time have gone over an extent of 720 miles, or 240 leagues, which is ſufficient to account for the longeſt migration; and if aided by a favourable current of air, there is reaſon to believe, that it will perform the ſame journey in a much ſhorter ſpace of time. For the method by which the flight of birds is performed, ſee the article FLYING. As birds are continually paſſing through hedges and thickets, their eyes are protected from external injuries, as well as from too much light, when flying in oppoſition to the ſun's rays, by a nictitating or winking membrane, which can be drawn over the whole eye like a curtain. This covering is neither opaque, nor wholly pellucid, but ſemi-tranſparent. By means of it the eagle is ſaid to be able to gaze at the ſun.

*Of the Nutrition, Neſts, Longevity, Diſeaſes, Fertility, and general Uſes of Birds, in the Economy of Nature.*—Birds may be diſtinguiſhed, like the animals of the claſs mammalia, into two kinds, or claſſes, *viz.* the granivorous and carnivorous, and there are ſome that hold a middle nature, and partake of both. Granivorous birds are furniſhed with larger and longer inteſtines than thoſe of the carnivorous kind. Their food, which conſiſts of grain of various ſorts, is conveyed whole and entire into the firſt ſtomach or craw, where it undergoes a partial dilution by a liquor ſecreted from the glands, and ſpread over its ſurface: it is then received into another ſpecies of ſtomach, where it is farther diluted; after which it is tranſmitted into the gizzard, or true ſtomach, conſiſting of two very ſtrong muſcles, covered externally with a tendinous ſubſtance, and lined with a thick membrane of prodigious power and ſtrength; in this place the food is completely triturated, and rendered fit for the operation of the gaſtric juices. (See BIRDS, *Anatomy of*.) Granivorous birds partake much of the nature and diſpoſition of herbivorous quadrupeds. In both, the number of their ſtomachs, the length and capacity of their inteſtines, and the quality of their food, are very ſimilar; they are likewiſe diſtinguiſhed by the gentleneſs of their temper and manners. Their chief attention is directed to procuring food, hatching and rearing their offſpring, and avoiding the ſnares of men, and the attacks of birds of prey, and other rapacious animals. They are in general ſo tractable as eaſily to be domeſticated. Carnivorous birds are diſtinguiſhed by the powers with which they are furniſhed by nature for the purpoſe of procuring their food. They are provided with wings of great length, the muſcles which move them being proportionably large and ſtrong, whereby they are enabled to keep long upon the wing in ſearch of prey: they are armed with ſtrong hooked bills, and ſharp and formidable claws: their ſight is ſo piercing and acute, as to enable them to view their prey from the greateſt heights in the air, upon which they dart with inconceivable ſwiftneſs, and undeviating aim: their ſtomachs are ſmaller than thoſe of the granivorous kinds, and their inteſtines are much ſhorter. The analogy between the ſtructure of rapacious birds and carnivorous quadrupeds is very obvious: both of them are provided with weapons which indicate deſtruction and rapine; their manners are fierce and unſocial, and they ſeldom live together in flocks, like the granivorous tribes. When not on the wing, rapacious birds retire to the tops of ſequeſtered rocks, or to the depths of extenſive foreſts, where they conceal themſelves in ſolitude. Thoſe which feed on carrion are endowed with a ſenſe of ſmelling ſo exquiſite, as to enable them to ſcent putrid carcaſes at aſtoniſhing diſtances.

Moſt birds, at certain ſeaſons, live together in pairs, and the union generally continues while the united efforts of both are neceſſary in forming temporary habitations, and in rearing their offſpring. Eagles and other birds of prey continue their attachment for a much longer time, and ſometimes for life. The neſts of birds are conſtructed with ſo much art as to baffle the utmoſt exertion of human ingenuity to imitate them. The mode of building, the materials they make uſe of, as well as the ſituations they ſelect, are as various as the different kinds of birds, and are all admirably adapted to their ſeveral wants and neceſſities. Birds of the ſame ſpecies

cies collect the ſame materials, arrange them in the ſame manner, and make choice of ſimilar ſituations for fixing the places of their temporary abodes. Wherever they diſpoſe themſelves, they always take care to be accommodated with a ſhelter, and if a natural one does not offer itſelf, they very ingeniouſly make a covering of a double row of leaves, down the ſlope of which the rain trickles, without entering into the little opening of the neſt that lies concealed below. In forming the neſt, they make uſe of dry wood, bark, thorns, reeds, thick hay, and compact moſs, as a foundation, and on this, as a firſt layer, they ſpread and fold in a round form all the moſt delicate materials, as down, wool, ſilk, ſpiders' webs, feathers, and other light ſubſtances, adapted for the purpoſes for which they are intended, and to the climate in which the neſts are ſituated. Thus, the oſtrich in Senegal, where the heat is exceſſive, neglects her eggs during the day, but ſits on them in the night. At the Cape of Good Hope, where the heat is leſs, the oſtrich, like other birds, ſits upon her eggs both day and night. In countries infeſted with monkies, many birds, which in other climates build in buſhes and clefts of trees, ſuſpend their neſts upon ſlender twigs, and thus elude the utmoſt art of their enemies. In all caſes we may obſerve, without entering into particulars, that the architecture of the neſts of each ſpecies ſeems to be adapted to the number of eggs, the temperature of the climate, or the reſpective dimenſions of the little animal's body. Small birds, whoſe eggs are generally numerous, make their neſts warm, that the animal heat may be equally diffuſed, but the larger ſpecies are leſs ſolicitous in this reſpect. The ſmaller tribes alſo, that live upon fruit and corn, and are often regarded as unwelcome intruders upon the labours of man, uſe every caution to conceal their neſts from the eye, while the only ſolicitude of the great bird is to render their refuge inacceſſible to wild beaſts and vermin.

As ſoon as the important buſineſs of neſt-making is completed, the female lays her eggs, the number of which varies according to the ſpecies: ſome have only two at a time, others four, five, or more, up to eighteen. (See the article Egg.) When the eggs are laid, the male and female brood over them by turns, though this is generally the province of the female.

The term of life varies greatly in birds, and does not ſeem to bear the ſame proportion to the time of acquiring their growth, as has been remarked with regard to quadrupeds. Moſt birds acquire their full dimenſions in a few months, and are capable of propagation the firſt ſummer after they are hatched. In proportion to the ſize of their bodies, they poſſeſs more vitality, and live longer than either man or quadrupeds. It is no very eaſy taſk to aſcertain the ages of birds; nevertheleſs we have, on unqueſtionable authority, inſtances of great longevity in many of them, particularly geeſe, ſwans, ravens, and eagles; among which, eagles have been known to attain the age of ſixty, ſeventy, eighty, or even a hundred years. The following ſcale has been given by Linnæus, Buffon, and other celebrated naturaliſts:

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| An eagle will live | 100 years. |
| A raven - | 100 |
| A gooſe - - | 70 |
| A partridge - | 25 |
| A turtle-dove - | 25 |
| A peacock - - | 25 |
| A pigeon from 10 to | 20 |

Linnets, goldfinches, canary-birds, and others in a ſtate of captivity, have been known to live many years. The longevity of birds has been imputed to the texture of their bones, the hardneſs and ſolidity of which have been aſſigned as the general cauſe of death in other animals. Thoſe of birds being lighter, and more porous in their conformation, preſent fewer obſtacles to the vital powers. Hence it has been aſſumed that the leſs ſolid the bones are, the more diſtant will be the period of death.

From the great longevity of birds, it has been inferred that they are ſubject to a few diſeaſes only: their annual moulting is thought to be the only one to which they are univerſally liable. As quadrupeds caſt their hair, ſo all birds every year obtain a new covering of feathers: this is what is termed moulting. During its continuance, they always appear ſickly and diſordered; the boldeſt loſe their courage; none produce young, and many die under the ſevere viſitation. No feeding can maintain their ſtrength, or preſerve their powers of reproduction. The nouriſhment which formerly went to the production of young, is now conſumed and abſorbed in adminiſtering a ſupply to the growing plumage. The manner in which nature performs this operation is ſlow in its progreſs. When birds have attained their full ſize, the pen part neareſt the animal grows harder and thicker in its ſides, but ſhrinks in its diameter: in conſequence of the firſt of theſe proceſſes, it draws gradually leſs nouriſhment from the body of the animal; and by its decreaſe in ſize, it becomes looſe, till it at length falls off. In the mean time, the rudiments of an incipient quill are forming; the ſkin becomes in ſhape like a little bag, which is fed from the body by a ſmall vein and artery, and which every day increaſes in ſize, till it is protruded. While one end vegetates into the beard or vane of the feather, that part attached to the ſkin is ſtill ſoft, and receives a conſtant ſupply of nouriſhment, which is diffuſed through the body of the quill by the artery and vein. When, however, the quill is come to its full growth, and requires no farther nouriſhment, the vein and artery become gradually leſs, till at laſt the ſmall opening by which they communicated with the quill is ſtopped, and the circulation ceaſes. The quill, after it is thus deprived of new ſupplies, continues for ſome months in the ſocket, till at laſt it ſhrinks, and makes room for another repetition of the ſame proceſs of nature. The moulting ſeaſon commences at the end of ſummer, and the bird continues to ſtruggle under the malady for a conſiderable part of the winter: then the appetite of the animal is leaſt craving, while its proviſions continue to be moſt ſcanty. It is not till the return of ſpring, when the feathers have attained their full growth, that the abundance of food and the mildneſs of the ſeaſon reſtore it to its full vigour.

A few words on the uſes of birds to the world, and its inhabitants, ſhall conclude this article. The rapacious kinds evidently ſerve the purpoſe of preſerving the ſalubrity of the air, by devouring all ſorts of carrion, ſcattered over the ſurface of the earth. The natural death, or accidental deſtruction of living creatures would communicate to the atmoſphere a putrid and noxious influence, were their carcaſes allowed to diſſolve and mingle with the ſoil by the ſlow proceſs of corruption. The order Grallæ co-operate in this employment. They deſtroy toads, lizards, ſerpents, &c, which would otherwiſe increaſe too faſt; and devour their bodies, that would more or leſs infect the air with putrid vapours. Hence the inhabitants of Holland and of Egypt are indebted to the labours of the ſtork. In the latter country, which abounds with every hideous reptile that a humid ſoil or ſultry ſun can quicken into life, this favourite bird is protected, even in its wild ſtate, by the laws of the land. The granivorous birds are alſo deemed of great utility in the ſyſtem of nature, inaſmuch as they abridge the fertility of thoſe weeds, which emit ſuch immenſe quantities

of ſeed, as would ſoon overſpread the earth, and which, if left unreſtrained, would infallibly overpower the more uſeful vegetables. Many ſpecies are uſeful in tranſporting ſeeds from one country to another, and thus diſſeminate plants more univerſally over the ſurface of the globe. Beſides the uſes to which the feathered tribes are ſubſervient in the general plan of nature, we may contemplate their connection with man, and obſerve how far they contribute to his pleaſure and advantage. It is worthy of obſervation, that of the vaſt number of birds which inhabit the globe, it has never been diſcovered that a ſingle one is of a poiſonous nature. They differ very much in being more or leſs ſalutary and palatable, as an article of diet; but none of them are pernicious. None of their eggs have been found to poſſeſs any noxious qualities; a circumſtance well known to ſeafaring people and travellers, who eat freely, and without the ſmalleſt heſitation, every ſpecies of egg, without finding any inconvenience from them.

As an article of food, all carnivorous birds are avoided, though not poiſonous: the piſcivorous alſo, eſpecially thoſe with ſharp bills, are generally diſliked, though ſome of the young are eaten with avidity. All water-fowl are generally reckoned a heavy and rancid food: the gooſe and duck are probably the beſt, and theſe are greatly improved by being fed on grain, and by being reſtricted, as much as poſſible, from fiſhes, ſlugs, worms, &c. Birds that live almoſt wholly on inſects are likewiſe generally avoided as an article of food; while the ſmaller birds, that ſubſiſt upon grain or ſeeds, are very much eſteemed. The woodcock, the ſnipe, and bittern, the whole tribe called mud-ſuckers, are accounted a great delicacy.

It has been remarked as a matter of ſurpriſe, that ſo few birds have been ſubſervient to economical uſes by domeſtication. They are naturally ſhy and timid, and appear but little ſuſceptible of attachment and obedience. Jealous of liberty, and furniſhed with effectual means of eſcape, they fly the haunts of men, and by far the greater part continues in the primitive wildneſs of nature. Few, even of thoſe that we denominate domeſtic, diſcover that familiarity or affection that obtains among thoſe quadrupeds which have given up independence for protection. Of the rapacious birds, not one ſpecies has ever been domeſticated by man, excepting for the purpoſes of falconry; and theſe are always taken, when young, from the neſts of the wild ones, a proof that they do not thrive and propagate in their captivity. The order Picæ, likewiſe, contains not one ſpecies that has ever been reduced to a domeſtic ſtate; but in the order Gallinæ, we have ſeveral ſpecies which have, with great advantage, been made ſubſervient to the purpoſes of domeſtic economy: ſuch are the peacock, turkey, the barn-door fowl, and the Guinea hen. Of the columbine tribe, one ſpecies only has been tamed, *viz.* that of the common pigeon. None of the paſſerine or ſtruthious orders have ever been domeſticated, though many of the former are reckoned delicate food. Four ſpecies of the duck kind have been brought from their wild ſtate to the ſervice of man; the ſwan, gooſe, Guinea duck, and the wild duck. The Grallæ, though excellent food, have none of them been domeſticated; ſo that it has been obſerved, that of four thouſand different ſpecies deſcribed by Latham, not more than ten or twelve have been rendered ſerviceable to the human race.

ORNITHOMANCY, a kind of divination, or method of arriving at the knowledge of futurity by means of birds.

Ornithomancy, amongſt the Greeks, was the ſame with augury among the Romans. See Augury and Omen.

ORNITHOPARCHUS, Andreas, in *Biography*, was born at Meinungen: he was maſter of arts, and author of the moſt general and extenſive treatiſe on practical muſic, that was produced in Germany after the writings of Gaffurio had appeared. His treatiſe was called Micrologus in imitation of Guido, and publiſhed at Cologn in 1535, though Walther thinks that was not the firſt edition. The author chiefly cites John Tinctor, Franchinus, and the tract written by our countryman John Cotton, whom he calls pope John XXII. His treatiſe, though the beſt of the time, ſeems too meagre and ſuccinct to have been of great uſe to the ſtudents of ſuch muſic as was then practiſed. It was, however, tranſlated into Engliſh in 1609, ſeventy years after its firſt publication, by our countryman John Douland, the celebrated luteniſt; a labour which he might have well ſpared himſelf, as Morley's Introduction, which was ſo much more full and ſatisfactory, precluded all want of ſuch a work as that of Ornithoparchus.

ORNITHOPUS, in *Botany*, a name altered by Linnæus from the *Ornithopodium* of preceding botaniſts, and derived, like that, from ὄρνις, *a bird*, and πους, *a foot*, the legumes having a ſtriking reſemblance to the toes of many ſmall birds. Linn. Gen. 381. Schreb. 503. Willd. Sp. Pl. v. 3. 1155. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 776. Prodr. Fl. Græc. Sibth. v. 2. 79. Juſſ. 361. Lamarck Illuſtr. t. 631. Gærtn. t. 155. (Ornithopodium; Tourn. t. 224.)—Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, with five nearly equal marginal teeth, permanent. *Cor.* papilionaceous. Standard inverſely heart-ſhaped, entire. Wings ovate, ſtraight, ſcarcely ſo large as the ſtandard. Keel minute, compreſſed. *Stam.* Filaments diadelphous, (one ſimple, the other in nine diviſions); anthers ſimple. *Piſt.* Germen linear; ſtyle briſtle-ſhaped, aſcending; ſtigma a terminal point. *Peric.* Legume awl-ſhaped, round, curved, jointed, with intermediate partitions, the joints falling off ſeparately. *Seeds* ſolitary, roundiſh.

Eſſ. Ch. Legume jointed, round, curved.

1. O. *perpuſillus*. Common Bird's-foot. Linn. Sp. Pl. 1049. Curt. Lond. faſc. 6. t. 53. Engl. Bot. t. 369. Fl. Dan. t. 730. (Ornithopodium minus; Ger. em. 1241.)—Leaves pinnate. Flowers capitate, accompanied by a leaf. Legumes incurved, beaded.—Native of ſandy or gravelly paſtures in various parts of Europe. A moſt elegant little annual plant, flowering in May. The *root* is fibrous, but often bears little fleſhy tubercles by which it is propagated, and in that caſe it cannot ſtrictly be termed annual. *Stems* proſtrate, much branched, from three to twelve inches long, furrowed, downy. *Leaves* pinnate, of numerous pairs of equal, elliptical, hairy, rather fleſhy leaflets, with an odd one at the end. *Flowers* in ſmall heads, on axillary ſtalks, with a leaf, of fewer leaflets than the others, at the ſummit of each common ſtalk, cloſe to the flowers. The *ſtandard* and *wings* are white, the former prettily ſtreaked with crimſon; *keel* greeniſh. *Legumes* parallel, beadlike, ſlightly compreſſed, pointed, downy, containing one ſeed in each of the numerous joints. There is a more luxuriant variety, whoſe floral leaf, as well as the flowers, are much larger than in our Britiſh kind. This is *Ornithopodium majus*, Ger. em. 1241.

2. O. *compreſſus*. Compreſſed Yellow Bird's-foot. Linn. Sp. Pl. 1049. Sm. Fl. Græc. Sibth. t. 714, unpubliſhed. (Scorpioides leguminoſa; Ger. em. 1241.)—Leaves pinnate. Flowers capitate, accompanied by a leaf. Legumes compreſſed, even-jointed, rugged, recurved.—Native of Italy, Sicily, and Greece, ſometimes raiſed for curioſity in our gardens, where it is a hardy annual, flowering about June. Larger than the former, with which it much agrees

in general habit, but the *corolla* is entirely yellow, and the *legumes* very different, being recurved, much flattened, and formed of quadrangular clofely united joints, making the outline of the margin even, fcarcely at all beaded, or notched.

3. O. *durus*. Spiral Bird's-foot. Cavan. Ic. v. 1. 31. t. 41. f. 2. Willd. n. 3.—Leaves pinnate. Flowers capitate, naked. Legumes fpirally recurved, nearly cylindrical, with flightly curved joints.—Native of hills in Spain, flowering in May and June. *Root* annual, not perennial. *Stems* erect, rigid, branched, three or four inches high. *Leaflets* ufually but three or four pair, with an odd one, obtufe, thick, fmooth, and glaucous. *Flowers* deep yellow, two or three on each ftalk, unaccompanied by a leaf. *Legumes* fpiral, flender, their joints fomewhat lunate as in *Hippocrepis*.

4. O. *fcorpioides*. Purflane-leaved Bird's-foot. Linn. Sp. Pl. 1049. Cavan. Ic. v. 1. 26. t. 37.—Leaves ternate, nearly feffile; the odd leaflet very large.—Differs from all the former in the great fize of its terminal *leaflets*, and the round kidney-fhape of the only pair of lateral ones. The *flowers* are yellow. *Legumes* moft like thofe of the laft fpecies. The whole of the herbage is glaucous and rather fucculent. No *leaf* accompanies the *flowers*.

5. O. *tetraphyllus*. Four-leaved Bird's-foot. Linn. Amœn. Acad. v. 5. 402. Sp. Pl. 1049. (Quadrifolium erectum, flore luteo; Sloane Jam. v. 1. 186. t. 116. f. 3.)—Leaves quaternate. Flowers folitary. Legume beaded.—Native of meadows in Jamaica, on a clay foil. This has the habit of a *Lotus*. The *leaflets* are obovate, emarginate, flightly downy, befprinkled with glandular dots, and grow four together at the fummit of a fhort common *footftalk*. *Flowers* yellow, folitary, on axillary ftalks, with a pair of *bracteas*. *Legume* incurved, flightly beaded, covered with refinous dots, its numerous joints tumid, and obliquely obovate. Linnæus fufpected this plant might form a new genus, for which we fee no other reafon than its foliage; but that indeed is foreign to the nature of the other fpecies, and in this tribe is undoubtedly very important.

6. O. *lævigatus*. Smooth Bird's-foot.—Leaves pinnate. Flowers fomewhat capitate, naked. Legumes incurved, cylindrical, with obfolete joints.—Native of Europe. Gathered by the abbé Durand at Gibraltar. We have it from Jacquin's herbarium for *O. perpufillus*, with which many botanifts feem to have confounded it, yet the plants are totally diftinct. The prefent is much larger than the *perpufillus*, with narrower more diftant *leaflets*, and only one or two *flowers* on a ftalk, without any floral leaf. *Corolla* yellow. *Legume* much incurved, flender, nearly cylindrical, fo even that the joints are hardly difcernible; its furface minutely reticulated, without hairs or downinefs.—It feems wonderful that authors fhould have overlooked this fpecies, which was certainly unknown to Linnæus. The *Ornithopodium pufillum*, Dalech. Hift. v. 1. 487, feems intended for it, and is indeed a very good repreſentation, the fecond, or fmaller figure in his p. 486, being unqueftionably the real *perpufillus*. The figure we have above cited for the latter in Ger. em. appears taken from Dalechamp's p. 487, but the legumes are fome of them made more jointed, and the defcription certainly belongs to *perpufillus*, as indeed does the account in Dalechamp, p. 487. The firft *Ornithopodium* of this author appears to be *Ornithopus compreſſus*.

ORNITHOSCOPI, ὀρνιθοσκοποι, in *Antiquity*, diviners, or foothfayers, who made predictions, and drew omens, from birds. They were likewife called *ornithomantes*, and *orneofcopi*, &c.

ORNITROPHE, in *Botany*, fo called by Commerfon, from ὀρνις, *a bird*, and τροφη, *food*, becaufe the fruit is a favourite food of blackbirds in the ifle of Bourbon, whence the French inhabitants have named the firft fpecies of this genus Bois de Merle. Juff. 247. Lamarck Illuftr. t. 309. Willd. Sp. Pl. v. 2. 322. Ait. Hort. Kew. v. 2. 348.—Claſs and order, *Octandria Monogynia*. Nat. Ord. *Sapindi*, Juff.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in four deep, ovate, rather unequal fegments. *Cor.* Petals four, roundifh, with a beard or creft in the centre of their difk. *Stam.* Filaments eight, inferted into a glandular receptacle, thread-fhaped, the length of the corolla; anthers roundifh. *Pift.* Germen ftalked, two-lobed, compreffed; ftyle one, divided; ftigmas fimple. *Peric.* Drupas two, ovate, fmall, flightly pulpy, each of one cell; one of them fometimes abortive. *Seed.* Nut folitary, obovate.

Eff. Ch. Calyx in four deep fegments. Petals four. Style cloven. Germen two-lobed. Drupas two.

1. O. *integrifolia*. Entire-leaved Ornitrophe. Willd. n. 1. Lamarck fig. 1.—Leaves ternate, ovato-lanceolate, wavy, nearly entire.—Gathered by Commerfon in the ifland of Bourbon. A *fhrub*, with round, fmooth, knotty branches. *Leaves* alternate, on longifh ftalks, ternate; *leaflets* ftalked, two or three inches long, nearly equal, elliptic-oblong, bluntly pointed, unequally and flightly wavy, fmooth, veiny. *Stipulas* none. *Clufters* axillary, ftalked, folitary, very minutely downy, their branches very fhort, and each bearing a tuft of fmall greenifh *flowers*, on fmooth partial ftalks. One lobe of the *germen* being ufually abortive, the fruit becomes a folitary pear-fhaped *drupa*, the fize of a pea

2. O. *ferrata*. Saw-leaved Ornitrophe. Ait. n. 1. Roxb. Coromand. v. 1. 44. t. 61.—Leaves ternate, rough, ovate, pointed ferrated.—One of the moft common plants on the coaft of Coromandel. Dr. Roxburgh obferves that among the mountains it grows to a fmall tree, but in the low lands near the fea it is a low branching fhrub, flowering during the wet feafon. The natives call it *Tauatiky*, and eat the fruit, which is fmall and red, growing in pairs, both lobes of the *germen* coming to perfection. The habit is much like the laft, but the *leaflets* are ftrongly ferrated, and the *petals* turned all to one fide, which does not appear to be the cafe in that, as far as we can learn from figures or dried fpecimens. Some *flowers* want the piftil.

3. O. *Cobbe*. Ceylon Ornitrophe. Willd. n. 3. (Rhus Cobbe; Linn. Sp. Pl. 382. Kobbæ; Herm. Zeyl. 24. Linn. Zeyl. 205.)—"Leaves ternate, ovate, acute, ferrated, downy beneath. Stalk of the clufters downy."—Native of Ceylon. We have feen neither fpecimen nor figure. Linnæus fays the *leaves* are either ternate or quinate. His defcription of the *inflorefcence* accords with both the preceding, but the common ftalk feems to be more downy. The fruit is faid to be black.

4. O. *Cominia*. Yellow-berried Ornitrophe. Willd. n. 4. (Rhus Cominia; Linn. Sp. Pl. 381. Schmidelia Cominia; Swartz Ind. Occ. v. 2. 667. Baccifera indica trifolia, fructu rotundo monopyreno; Sloane Jam. v. 2. 100. t. 208. f. 1.)—Leaves ternate, elliptic-oblong, unequally ferrated, downy beneath. Common flower-ftalks branched, downy.—Native of Jamaica; cultivated by Miller in 1759. A *tree* thirty feet high. *Leaves* dark green above; white and downy, with innumerable reticulated veins, beneath. *Flowers* very fmall, thickly fet in denfe hairy clufters, feveral of which grow on one branched downy common ftalk. The *fruit* is defcribed by Sloane as no bigger than a fmall pin's head, orange-coloured, with very little pulp. *Molago Maram*, Rheede Hort. Malab. v. 5. 49. t. 25, quoted for this fpecies by Linnæus, has whitifh *fruit*, and more diftant *flowers*,

*flowers*, otherwiſe they ſeem nearly allied; but we have reaſon to think there are many ſpecies of this genus as yet undeſcribed by ſyſtematic writers; nor is our knowledge at preſent ſufficient for us to ſettle the ſynonyms of thoſe already publiſhed.

5. O. *occidentalis*. Weſt-Indian Ornitrophe. Willd. n. 5. (Schmidelia occidentalis; Swartz Ind. Occ. v. 2. 665. Alophyllus racemoſus; Swartz Prodr. 62.)—Leaves ternate, ſlightly downy beneath. Cluſters ſolitary.—Native of buſhy hills in Hiſpaniola.—A *ſhrub*, nine or ten feet high, with many ſmooth branches. *Leaflets* nearly ſeſſile, cloſe together, oblong, contracted at the lower part, pointed, ſlightly downy beneath; the lateral ones oblique at the baſe. *Cluſters* ſimple. *Flowers* white, ſmall; on ſome ſhrubs male only.

6. O. *rigida*. Rigid Simple-leaved Ornitrophe. Willd. n. 6. (Schmidelia rigida; Swartz Ind. Occ. v. 2. 663. Alophyllus rigidus; Sw. Prodr. 62.)—Leaves ſimple, with ſpinous teeth. Cluſters ſolitary. Native of dry mountainous parts of Hiſpaniola, but extremely rare. A rigid *ſhrub*, with alternate, ſimple, ſtalked, lanceolate *leaves*, rough above, downy beneath, with ſtrong reticulated veins, and ſmall ſpinous marginal teeth. *Cluſters* axillary, ſolitary, ſtalked, hairy.

After all that has been ſaid of this genus, it is perhaps not diſtinct from *Schmidelia*, with which it preciſely accords in habit, differing chiefly in having but one *ſtyle*, inſtead of two, and a *calyx* with four deep ſegments, inſtead of one of two leaves. But the twin *germen* in *Ornitrophe*, ſhews the former character to be but ambiguous, and the *calyx* having two larger and two ſmaller ſegments, renders the latter ſomewhat ſuſpicious. See SCHMIDELIA.

ORNON, in *Geography*, an iſland in the Baltic, near the coaſt of Sweden. N. lat. 68 . E. long. 18° 6′.

ORNOS, a ſea-port on the S. coaſt of the iſland of Myconi. N. lat. 37° 24′. E. long. 25° 20′.

ORNUS, in *Botany*, the name of a plant mentioned by Virgil and Pliny; as a large and majeſtic tree, preferring mountainous ſituations. It is generally taken for the Manna Aſh, or μελια of Dioſcorides; ſee FRAXINUS *Ornus*. Geſner, Ruellius, Dodonæus, and ſome others, have ſuppoſed our Mountain Aſh, *Pyrus ancuparia*, Fl. Brit. to be the true *Ornus*. Dodonæus very rightly obſerves that Virgil in his Georgics, book 2. l. 71, ſpeaks of it as a tree on which the pear was engrafted. This is much in favour of his opinion, though he did not deduce any argument from it. The pear is much more likely to ſucceed by grafting on a ſtock of its own natural order or genus, than on one ſo remotely allied as any *Fraxinus*. Virgil moreover always ſpeaks of the majeſtic growth and ſtrength of his *Ornus*, which is far more applicable to the plant of Dodonæus, Ruellius, and Geſner than to the Manna Aſh.

ORO, in *Geography*, a mountain of Switzerland, in the country of the Griſons; 13 miles W. of Bormio.

ORO, *Cape d'*, the eaſtern point of the iſland of Negropont, anciently called "Caphareus," in the iſland of Eubœa. N. lat. 38 8′. E. long. 24° 40′.—Alſo, a cape on the W. coaſt of Africa, called "Oleredo." N. lat. 23° 30′. W. long. 15° 20′.

OROBANCHE, in *Botany*, Οξοβαγχη of the Greeks, ſo called from οξοβος, *a vetch*, and αγχω, *to ſtrangle* or *ſuffocate*, becauſe this paraſite is believed to ſtarve, or render barren, the plants on which it grows. Having been originally obſerved upon the Broom in England, it is here named Broom-rape. Linn. Gen. 321. Schreb. 421. Willd. Sp. P. v. 3. 347. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 668. Prodr. Fl. Græc. Sibth. v. 1. 440. Juſſ. 101. Tourn. t. 81. Lamarck Illuſtr. t. 551. Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Perſonatæ*, Linn. *Pediculares*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of two leaves moſtly divided, lateral, ſometimes combined at their baſe, erect, coloured, permanent. *Cor.* of one petal, ringent, withering. Tube bending, ample, inflated. Limb ſpreading; its upper lip concave, dilated, notched; lower reflexed, three-cleft, uneven at the margin, its ſegments various in ſize and proportion. Nectary a gland, in front, at the baſe of the germen. *Stam.* Filaments four, awl-ſhaped, concealed under the upper lip, two of them longeſt; anthers erect, approximated, ſhorter than the corolla, tumid, two-lobed and acutely awned. *Piſt.* Germen ſuperior, oblong; ſtyle ſimple, the length and poſition of the ſtamens; ſtigma drooping, thick, of two obtuſe lobes. *Peric.* Capſule ovate-oblong, pointed, of one cell and two valves. *Seeds* numerous, minute. *Receptacles* four, linear, lateral, attached to the valves.

Eſſ. Ch. Calyx of two lateral leaves. Corolla ringent. Capſule of one cell and two valves. Seeds numerous. A gland under the germen in front.

* *Bracteas ſolitary.*

1. O. *major*. Greater Broom-rape. Linn. Sp. Pl. 882. Sutton Tr. of Linn. Soc. v. 4. 175. Engl. Bot. t. 421. Curt. Lond. faſc. 4. t. 44.—Stem ſimple. Corolla inflated; the ſegments of its lower lip equal and acute. Stamens ſmooth. Style downy.—Native of Europe, in buſhy places on a barren ſandy ſoil, growing paraſitically on the roots of *Spartium* or *Ulex*, and flowering in June and July. The *root* is ſuppoſed to be perennial, and fixes itſelf by numerous fleſhy fibres. Whole *herb* of a dull purpliſh-brown, the *corolla* only when freſh being rather more purple than the reſt. The *ſtem* is ſimple, erect, angular, downy, ſucculent, about a foot high, clothed with ſcattered, lanceolate, leafy *ſcales*, ſhorter and more crowded about the bottom, which aſſumes a ſwelling ovate figure. *Spike* terminal, ſimple, rather cloſe, of many *flowers*, each of which is accompanied by a ſimple lanceolate *bractea*. *Calyx* of two lateral oppoſite leaves, each divided more than half way down into two equal, lanceolate, acute ſegments. *Corolla* an inch long, inflated, a little incurved, keeled at the back; its upper lip entire, with a reflexed waved margin; lower in three equal, acute, dependent lobes, more or leſs wavy or ſlightly crenate; theſe are beſt repreſented in the diſſection of the flower in Engl. Bot. and in every part of Curtis's figure. *Stamens* channelled and quite ſmooth in their lower part, though a little glandular at the very ſummit. *Style* downy throughout, with a ſmooth *ſtigma* of two yellow ſeparate little globes. Every author has confounded this ſpecies with *O. major garyophyllum olens* of Bauhin's Pinax, 87, till the writer of the preſent article diſtinguiſhed them; ſee the next ſpecies. Even Ray fell into this error, the true plant of Bauhin not being a native of Britain; and Curtis attributes to ours "a faint ſmell of cloves," which it has not, from reading in various books that ſuch a ſcent belonged to *O. major*.

2. O. *caryophyllacea*. Clove-ſcented Broom-rape. Sm. Tr. of Linn. Soc. v. 4. 169. Willd. n. 3. (O. major; Pollich. Palatin. v. 2. 200. O. n. 295; Hall. Hiſt. v. 1. 129. O. major, garyophyllum olens; Bauh. Pin. 87.)—Stem ſimple. Corolla inflated, criſped at the edge; the ſegments of its lower lip equal and obtuſe. Lower part of the ſtamens hairy on the inner ſide. Native of Germany, Switzerland, and Italy. Our ſpecimens were gathered in April 1787, on ſhrubby hills near Valcimara, at the foot of the Apennines. This has the appearance of the former, but ſmells ſtrongly like cloves,

when freſh. It has, moreover, the three ſegments of the lower *lip* obtuſe, and much more fringed and curled. The *germen* is entirely ſmooth, which in *O. major* is hairy in the upper part, and the *ſtyle* is much leſs downy than in that ſpecies. But the ſtrongeſt mark of diſtinction is found in the copious hairs which clothe the inner ſide of the *ſtamens*, that part being always quite ſmooth in the *major*. The *ſtigma* is brown or purpliſh, that of the *major* yellow. We have received Swiſs ſpecimens which prove this to be Haller's n. 295. That author deſcribes a variety with a denſe conical ſpike, a very ſhort *flower*, and very prominent *ſtyle*, of which he had ſeen a drawing only. Linnæus had a ſpecimen from Pomerania, which anſwers exactly to this deſcription, and appears really to be a variety of our *caryophyllacea*, with which its *ſtamens* and *ſtigma* exactly agree. We have from Dr. Roth an Hercynian ſpecimen, marked *O. arenaria* of Borkhauſen, which is likewiſe our *caryophyllacea*.

3. O. *fœtida*. Fœtid Broom-rape. Desfont. Atlant. v. 2. 59. t. 144. Willd. n. 2. (O. major β; Vahl. Symb. v. 2. 70. O. flore ſpecioſo fimbriato ruberrimo; Shaw Spec. n. 452.)—Stem ſimple. Corolla ſomewhat inflated; all its ſegments rounded, and toothed at the edge. Stamens hairy at the top and bottom. Style ſlightly hairy upwards.—Frequent in wild as well as cultivated ground in Barbary, in the ſpring. We have a ſpecimen from M. Desfontaines. It is taller and more ſlender in habit than either of the former, with a long cylindrical ſpike. The *calyx-leaves* are ſplit into two deep, long, and narrow, unequal ſegments. *Corolla* dark purple; its upper lip in two, and lower in three, all nearly equal rounded lobes, ſharply toothed at the edge. *Stamens* hairy at the very baſe and ſummit only, otherwiſe ſmooth. *Style*, and top of the *germen*, beſprinkled with hairs. The *flowers* are ſaid to be fœtid, but, according to Vahl, this circumſtance is variable.

4. O. *rubra*. Red Fragrant Broom-rape. Sm. Engl. Bot. t. 1786.—Stem ſimple. Corolla tubular, fringed; its upper lip cloven; lower in three nearly equal ſegments. Stamens fringed on one ſide at the baſe; germen and ſtyle at their ſummits. Calyx-leaves undivided.—Diſcovered by John Templeton, eſq. a moſt acute and obſerving botaniſt, growing plentifully on the baſaltic rock at Cave-hill, near Belfaſt, in Auguſt 1805. The *roots* creep, but do not appear to be attached to thoſe of any other plant. Whole plant near a foot high, of a purpliſh-red, ſlightly downy. The *flowers* ſmell powerfully like a honeyſuckle or pink. It ſeems moſt akin to the laſt, but the ſegments of the upper *lip* are conſiderably larger than thoſe of the lower; all of them are minutely fringed with fine glandular hairs. The peculiar lateral pubeſcence of the *germen*, *ſtyle*, and *ſtamens*, in the parts above-mentioned, and, above all, the undivided *calyx-leaves*, diſtinguiſh this ſpecies from all the foregoing.

5. O. *cæruleſcens*. Blueiſh Broom-rape. Willd. n. 4.—Stem ſimple. Corolla tubular. Bracteas the length of the flower, clothed, like the divided calyx-leaves, with white hairs. Stamens and ſtyle ſmooth.—Native of Siberia, near the Caſpian ſea, from whence it was ſent to Profeſſor Willdenow by his friend Stephanus. We have a ſpecimen, gathered at Algiers by the late M. Brouſſonet, which anſwers in every point to Willdenow's deſcription, except that the *ſtyle* and *germen* in ours are glandular. He deſcribes his plant as having a ſimple *ſtem*, near a foot high, ſtriated, downy, clothed above with white ſhaggy hairs, as are alſo its *ſcales* or *leaves*. *Spike* denſe, three inches long, white in conſequence of the long ſnowy hairs which cover the *bracteas* and *calyx*, though the *flowers* are blueiſh. *Bracteas* ovate, with a taper point equal to the flowers. *Calyx-leaves* in two deep, unequal, awl-ſhaped ſegments, almoſt as long as the tube of the *corolla*, which is not inflated. *Stamens* and *piſtil* ſmooth.

6. O. *comoſa*. Tufted Broom-rape.—Stem ſimple. Corolla inflated. Bracteas hairy; the lower ones broad and ovate; the upper elongated and taper-pointed. Stamens and ſtyle ſmooth. We have received this from our learned friend Mr. Schmaltz of Palermo, by the name of *O. rubra*; but it is different from what we have deſcribed above under that appellation, the *calyx-leaves* being deeply divided. The *ſcales* of the ſtem, as well as the lower *bracteas*, are remarkably broad, obtuſe, and covered externally with white ſhaggy hairs; while the upper *bracteas* are furniſhed with long, ſpreading, ſmooth points, and crowded into a tuft, apparently producing no flowers. The inflated *corolla* ſeems to diſtinguiſh it from the laſt; the lower *lip* is in three very obtuſe, broad lobes, connected by elevated plaits.

7. O. *elatior*. Tall Broom-rape. Sutton Tr. of Linn. Soc. v. 4 178. t. 17. Sm. Fl. Brit. n. 2. Engl. Bot. t. 568. Willd. n. 5. (O. major; Sibth. Oxon. 191, according to Profeſſor Williams.)—Stem ſimple. Corolla tubular; the ſegments of its lower lip equal and acute. Stamens downy. Style ſmooth.—Common in fields, and about their borders, in England and Germany, eſpecially on a gravelly ſoil, flowering in July and Auguſt. This is taller, and of a more yellowiſh hue than *O. major*, with which moſt botaniſts have confounded it, but the Rev. Dr. Sutton, by attending to the hairineſs of the *ſtamens*, firſt well diſtinguiſhed the preſent ſpecies. Its *roots* moſtly adhere to thoſe of *Trifolium pratenſe*, or *Centaurea Scabioſa*. The *flowers* are more copious than in any other Britiſh ſpecies, with a leſs turgid *corolla*, whoſe upper lip is divided, dilated, fringed, and criſped. They have no ſcent. The *calyx-leaves* are united in front. Upper part of the *ſtamens*, as well as the whole *ſtyle* and *germen*, very ſmooth. *Stigma* inverſely heart-ſhaped, yellow.

8. O. *minor*. Leſſer Broom-rape. Sm. Fl. Brit. n. 3. Engl. Bot. t. 422. Sutton Tr. of Linn. Soc. v. 4. 179. Willd. n. 7. (O. major; Loefl. Hiſp. 151. O. flore minore; Bauh. Hiſt. v. 2. 781. Dill. in Raii Syn. *288. Tourn. Inſt. 176.)—Stem ſimple. Corolla tubular; the middle ſegment of its lower lip lobed. Stamens fringed. Style ſmooth.—Abundant in fields of clover in Britain, on whoſe roots it grows paraſitically. Loefling gathered it on the roots of elms, in the royal gardens of Aranjuez, and his ſpecimens are in the Linnæan herbarium. This is ſmaller than the laſt, with fewer and ſmaller *flowers*, whoſe *calyx-leaves* are diſtinct, and variable in ſhape, being ſometimes undivided. The *ſtamens* are merely fringed at their edges. *Stigma* dilated, purple. The middle ſegment of the *lip* being larger, and moſtly three-lobed, is a ſtrong character. The colour of the whole plant is uſually purpliſh, but there is a variety with pale yellow *flowers*, reſembling the *Monotropa* in hue.

9. O. *alba*. White Broom-rape. Willd. n. 8.—Stem ſimple. Corolla tubular, toothed; its lower lip in three rounded, nearly equal ſegments. Stamens ſlightly fringed below. Style hairy upwards. Calyx-leaves undivided, combined.—Native of Siberia, near the Caſpian ſea. *Stem* half a foot high, tawny and hairy. *Spike* about two inches long, the lower *flowers* remote. *Bracteas* ovate, acute, hairy, rather exceeding the *calyx*, whoſe ſegments are undivided, combined at their baſe. *Corolla* cylindrical, the ſize of the laſt, white, clothed with glandular hairs. Upper *lip* inverſely heart-ſhaped, toothed; lower as above deſcribed. *Filaments* ſmooth, dilated at the baſe, where they

are

are furniſhed with a few glandular marginal hairs. *Germen* ſmooth. *Style* ſmooth, clothed with glandular hairs in the upper part. *Stigma* large, two-lobed. *Willd.* We have ſeen no ſpecimen.

10. O. *gracilis*. Slender-ſtalked Broom-rape. Sm. Tr. of Linn. Soc. v. 4. 172. Willd. n. 9.—Stem ſimple. Corolla inflated; its lower lip very ſhort, the ſegments inverſely heart-ſhaped, unequal, criſped and jagged. Stamens and ſtyle looſely hairy, prominent.—Gathered by the writer of this, in July 1787, in hilly paſtures at St. Orſeſe near Genoa. Dr. Noehden found the ſame high on the Pyrenées. This is of a more ſlender habit than any of the above, and is from one to two feet high. The large inflated *corolla*, and ſhort lower *lip*, eſſentially diſtinguiſh it from *O. minor*, as well as the hairy *ſtyle*, and greater length of the *ſtamens*. We do not recollect the plant's having when freſh any peculiar ſmell.

11. O. *cernua*. Drooping-flowered Broom-rape. Linn. Sp. Pl. 882. Loefl. Hiſp. 152, excluding the ſynonyms.—Stem ſimple. Corolla tubular, bent downward; its upper lip divided; lower in three equal rounded ſegments, flat. Stamens ſlightly fringed at the baſe. Style ſmooth, incurved.—Gathered by Loefling, whoſe ſpecimen is before us, on the roots of *Artemiſia campeſtris*, in very barren fields at Aranjuez in Spain. *Stem* about ſix inches high. *Spike* lax, of about a dozen ſmooth pale *flowers*, with a purple limb, remarkable for the ſtrong curvature in their tube, by which the mouth is turned directly downwards. The *bracteas* are broad, ovate, ribbed and downy. *Calyx-leaves* ovate, inflated; thoſe of the lower flowers entire, of the upper uſually cloven. *Stamens* and *ſtyle* ſtrongly incurved. Can this be the *O. media*, Desfont. Atlant. v. 2. 59?

12. O. *americana*. American Broom-rape. Linn. Mant. 88. Willd. n. 10.—Stem ſimple. Scales imbricated, ſmooth, Corolla tubular, bent downward; its upper lip vaulted; lower in three equal oblong ſegments. Stamens and ſtyle incurved, very ſmooth. Calyx ſimple.—Sent by the late Dr. Garden, from South Carolina. The whole plant is remarkably ſmooth, yellow, a ſpan high. *Scales* cloſely imbricated, poliſhed, pale, ovate. *Spike* denſe, of numerous *flowers*, ſmaller than any of the foregoing, and deflexed as in the laſt. *Bracteas* lanceolate, pale and ſmooth like the ſcales of the ſtem. *Calyx* of one leaf, ſcarcely divided.

13. O. *virginiana*. Virginian Broom-rape. Linn. Sp. Pl. 882. Willd. n. 11. (O. minor virginiana lignoſior, per totum caulem floribus minoribus onuſta; Morif. v. 3. 502. ſect. 12. t. 16. f. 9.)—Stem branched. Corolla tubular; its lower lip in three equal acute ſegments. Calyx ſimple, four-toothed. Capſule globoſe.—Gathered by Banniſter and Kalm in Virginia. This is widely different from all the foregoing, in its ſlender much-branched *ſtem*, and ſmall, racemoſe, numerous, rather diſtant *flowers*. The *bracteas* are ſmall and ovate, about as long as each partial *flower-ſtalk*. *Calyx* hemiſpherical, with four teeth. *Corolla* ſlender, ſomewhat incurved, about half an inch long; its *lips* ſmall, the upper vaulted. *Style* prominent, with a capitate, ſcarcely lobed *ſtigma*. The *ſtamens* we have no opportunity of examining.

14. O. *purpurea*. Purple Cape Broom-rape. Linn. Suppl. 288. Willd. n. 6.—Stem ſimple, racemoſe. Corolla tubular; its limb in four rounded equal ſegments. Calyx ſimple, five-cleft. Anthers curved, with a double ſpur at their baſe.—Gathered at the Cape of Good Hope by Thunberg. This appears to us very improperly referred to the genus in queſtion, with which its *calyx* and *corolla* by no means agree. We have not ſufficient materials to fix it firmly elſewhere. The plant is a foot high, nearly leafleſs, downy, purple, turning black in drying. *Corolla* an inch and a half long, curved, taper at the baſe. *Flower-ſtalks* about as long as the *corolla*, with an oblong *bractea* at the baſe of each.

* * *Bracteas three together.*

15. O. *cærulea*. Purple European Broom-rape. Villars Dauph. v. 2. 406. Sm. Fl. Brit. n. 4. Engl. Bot. t. 423. Sutton Tr. of Linn. Soc. v. 4. 182. Willd. n. 13. (O. purpurea; Jacq. Auſtr. t. 276. O. Gmel. Sib. v. 3. t. 46. f. 1. O. n. 294; Hall. Hiſt. v. 1. 129. O. quarta; Lob. Ic. v. 2. 269. O. ſecunda; Cluſ. Hiſt. v. 1. 271. O. flore majore; Ger. em. 1312.)—Stem ſimple. Bracteas ternate. Upper lip of the corolla divided and notched.—Native of graſſy paſtures near the ſea, at Montpellier, as well as in Hampſhire and Norfolk. It is alſo found in Auſtria, Siberia, and Switzerland. This ſpecies flowers with us in July. It is rare, and its ſynonyms have been very much miſunderſtood. Linnæus, who did not know the plant, confounded its hiſtory with that of a Siberian *Lathræa*, under the name of *O. lævis*, which appellation it was impoſſible to retain for the preſent plant, and therefore the above was choſen. The habit is more ſlender, and leſs pubeſcent, than any of our three Britiſh ſpecies in the firſt ſection, the colour more dark and violet; the *flowers* longer. The *bracteas* are three, one large and external, two ſmaller, internal. *Calyx* tubular at the baſe, the leaves being united; their lobes in two nearly equal awl-ſhaped ſegments. *Corolla* paliſh violet, ribbed, tubular much longer than the bracteas; its upper lip aſcending, more or leſs deeply two-lobed, with a notch or two between the lobes; lower of three equal, ovate, entire, dependent lobes, not undulated, the palate elevated, divided, white and downy. *Stamens* entirely ſmooth. *Germen* ſmooth; *ſtyle* a little downy. The *Orobanche* of Beſl. Hort. Eyſt. æſt. ord. 7. t. 2, cited by Bauhin under his *O. flore majore*, (ſee Tr. of Linn. Soc. v. 4. 167) appears intended for the ſpecies before us, though bad, and perhaps imitated from old wooden cuts. It is ſcarcely poſſible that this or any *Orobanche* ſhould have been cultivated in the garden at Aichſtat, though it might grow in the neighbouring fields. The hiſtory of the confuſion between this plant and the *Orchis abortiva* of Linnæus, which gave riſe to the report of the latter growing in Hampſhire, is given at length by the writer of the preſent article, in Tr. of Linn. Soc. v. 4. 164. The reader may alſo conſult Sm. Fl. Brit. 927.

16. O. *ramoſa*. Branched Broom-rape. Linn. Sp. Pl. 882. Sm. Fl. Brit. n. 5. Engl. Bot. t. 184. Sutton Tr. of Linn. Soc. v. 4. 185. Willd. n. 17. Ger. em. 1312. (O. n. 296; Hall. Hiſt. v. 1. 130. O. Camer. Epit. 311.)—Stem branched. Bracteas ternate. Upper lip of the corolla in two rounded entire ſegments. This grows amongſt Hemp, to which plant its roots are attached, and whoſe ſeeds it is ſuppoſed to render abortive. It occurs in various parts of Europe, flowering in the latter part of ſummer. This is more nearly allied to the laſt, and to *O. cernua*, than any other. With *cærulea* it agrees in having a pair of internal *bracteas*, but the *ſtem*, being invariably more or leſs branched, except occaſionally perhaps in a very poor ſtarved ſpecimen, diſtinguiſhes it from all except the *virginiana*, and with that it has few characters in common beſides. The *ramoſa* is of a brighter purple hue in its *flowers* than any other Britiſh *Orobanche*, and in Greece the colour is ſtill more vivid, and the plant very beautiful as well as luxuriant. The ſegments of the *corolla* are more equal and rounded than in *cærulea*, nor are there any intermediate teeth or

notches in the upper lip. The *root* of the ſpecimen figured in Engl. Bot. is diſeaſed and ſwollen, in conſequence of the attacks of ſome inſect, probably a *Cynips*.

*** *Bracteas none.*

17. O. *uniflora*. Single-flowered Broom-rape. Linn. Sp. Pl. 882. Willd. n. 12. (Gentianella minor aurea, flore ſingulari amplo deflexo pallidé flaveſcente; Pluk. Mant. 89. Phyt. t. 348. f. 3.)—Stems ſingle-flowered. Calyx without any bractea.—Native of Maryland and Virginia. The *root* is ſmooth, ſomewhat creeping, branched, thick, but ſhort, furniſhed with rounded alternate *ſcales*, and perhaps ought to be reckoned a partly ſubterraneous ſtem. From within each of the ſcales ſprings a ſolitary, erect, round, ſimple, naked *ſtem* or *ſtalk*, four or five inches high, rather downy, eſpecially upward, bearing one large rather drooping *flower*, of the ſame yelloviſh or purpliſh hue as in ſeveral of the other ſpecies. The *calyx* is bell-ſhaped at the baſe, the leaves being united; but whether there are four ſegments or five, our ſpecimens are not in a condition to ſhew. *Corolla* above an inch long, ribbed, downy; its upper lip in two deep, rounded, obtuſe lobes; lower in three ſimilar equal lobes; all finely fringed with glandular hairs. *Stamens* and *ſtyle* much ſhorter than the corolla, all ſmooth, at leaſt in their upper half. Plukenet's figure repreſents the *corolla* as with only four ſegments; hence Willdenow refers this ſpecies to his firſt ſection; but his mode of ſubdividing the genus is very exceptionable.

Willdenow unites with this genus the *Phelypæa* of Tournefort and Desfontaines, which we cannot but conſider as well diſtinguiſhed by the five deep rounded ſegments of its *calyx*, to ſay nothing of the habit. See PHELYPÆA.

*Æginetia*, publiſhed by Linnæus in the firſt edition of Sp. Pl. but referred to *Orobanche* in the ſecond, is well reſtored by Dryander in Roxb. Coromand. v. 1. 63. t. 91, and by Willdenow, Sp. Pl. v. 3. 347. Its *calyx* is of one leaf, burſting laterally, and the *capſule* of numerous cells.

OROBOIDES, a name given by Hippocrates, and other authors, to a furfuraceous ſediment in the urine of perſons who have the jaundice: it is uſually of a reddiſh-brown colour; and is not peculiar to that diſeaſe, but is found in ſome others.

OROBUS, in *Botany*, a name borrowed from the Greeks, whoſe ὄροβος, however, is generally ſuppoſed to be the *Ervum*, or Tare, of the Latins, a very different genus from what we now call *Orobus*. Ambroſinus derives the word from ὀρύω, *to excite*, and βοῦς, *an ox*, becauſe horned cattle, feeding upon this plant, thrive, and grow courageous, or prone to combat. Linn. Gen. 374. Schreb. 496. Willd. Sp. Pl. v. 3. 1072. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 761. Prodr. Fl. Græc. Sibth. v. 2. 63. Juſſ. 360. Tourn. t. 214. Lamarck Illuſtr. t. 633. Gærtn. t. 151. —Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, obtuſe at the baſe; its orifice oblique, with five very ſhort teeth; the three lowermoſt ſharpeſt; the two uppermoſt ſhorteſt, moſt deeply and obtuſely divided; withering. *Cor.* papilionaceous. Standard inverſely heart-ſhaped, reflexed at the ſummit and ſides, longer than the other petals. Wings two, oblong, nearly equal to the ſtandard, aſcending, cohering together. Keel manifeſtly divided below, pointed, aſcending; its margins parallel, cohering, compreſſed; tumid in front. *Stam.* Filaments in two ſets, one ſimple, the other in nine diviſions, curved upwards; anthers roundiſh. *Piſt.* Germen cylindrical, compreſſed; ſtyle thread-ſhaped, bent upwards, erect; ſtigma linear, downy at the inner ſide from the middle to the top of the ſtyle *Peric.* Legume round, long, with a ſharp aſcending point, of one cell and two valves. *Seeds* numerous, roundiſh.

Eſſ. Ch. Style linear, roundiſh, downy above. Calyx obtuſe at the baſe; its two upper ſegments deepeſt and ſhorteſt.

1. O. *lathyroides*. Upright Blue Bitter-vetch. Linn. Sp. Pl. 1027. (Lathyroides erecta, &c.; Amman. Ruth. 114. t. 7. f. 2.)—Leaves in pairs, elliptical, nearly ſeſſile. Stipulas toothed.—Frequent throughout Siberia in open mountainous graſſy paſtures, flowering in June and July. Sibthorp gathered it on mount Athos. Miller is ſaid to have cultivated it formerly. We ſaw the plant in flower at Meſſrs. Lee and Kennedy's in 1809, but it is of rare occurrence in gardens, though worthy of notice on account of its beautiful tufts, or ſhort cluſters, of blue *flowers*, which partake of the elegance of form, and variegation of colour, proper to this genus. The *root* is perennial. *Stems* upright, ſimple, leafy, a foot and half high. *Leaves* alternate, of two light-green, elliptical, more or leſs blunt, entire, ſmooth leaflets, above an inch long, reticulated with copious veins, nearly ſeſſile, with a minute briſtle between them. *Stipulas* broadiſh, half-arrowſhaped, variouſly toothed. *Flower-ſtalks* axillary, ſolitary, ſhorter than the leaves, bearing a cluſter of eight or ten inodorous *flowers*, all turned one way. The *calyx* is purpliſh, ſlightly hairy. *Claws* of all the *petals* pale. Summit of the *keel* and *wings* of a beautiful blue, with darker veins. *Seeds* four or five, in a long narrow *legume*, with ſpiral valves.

2. O. *hirſutus* Hairy Bitter-vetch. Linn. Sp. Pl. 1027. Sm. Fl. Græc. Sibth. t. 690, unpubliſhed. (O. ſylvaticus, foliis circa caulem auriculatis; Buxb. Cent. 3. 22. t. 41.) —Leaves in pairs, ovate, ſtalked. Stipulas entire, nearly as big as the leaflets.—Native of ſhady woods in Thrace, flowering in May; *Buxbaum*. Sibthorp gathered it on Parnaſſus, Hæmus, and the Sphaciotic mountains of Crete. The *ſtems* are much taller than in the laſt, and branched, but weak and trailing. *Leaflets* not half ſo large, acute, with parallel veins, fringed at the edges, and ſupported by a common *ſtalk* near an inch long, at whoſe baſe ſtands a pair of large *ſtipulas*, much like the leaflets, but elongated into an acute point at the baſe. Common *flower-ſtalks* three or four times as long as the leaves, hairy, each bearing but two or three rather large pea-like *bloſſoms*, whoſe *calyx* is hairy, with long taper teeth, the *ſtandard* of a light violet blue, the *wings* paler, and *keel* nearly white. This ſpecies has not as yet been ſeen in our gardens.

3. O. *luteus*. Yellow Bitter-vetch. Linn. Sp. Pl. 1028. (O. montanus; Scop. Carn. v. 2. 60. t. 41. O. n. 17; Gmel. Sib. v. 4. 13. t. 4. O. n. 419; Hall. Helvet. v. 1. 182. O. pannonicus quartus; Cluſ. Pann. 741. Hiſt. v. 2. 231. O. montanus, flore albo; Ger. em. 1248. Galega montana; Dalech. Hiſt. 1139.)—Leaves pinnate, with about five pair of elliptic-lanceolate leaflets. Stipulas half-arrowſhaped, toothed.—Native of the Alps and Pyrenées, as well as of mountains in Hungary, and about rivers in Siberia, flowering in May. Dr. Sibthorp gathered it on the Bithynian Olympus. We have ſeen it cultivated by the preſent Biſhop of Carliſle at Ealing, and occaſionally elſewhere, nor can we help regretting that ſo fine a plant, which Haller ſays is one of the moſt handſome of the papilionaceous tribe, and with whoſe figure and deſcription in Cluſius and his followers he juſtly finds fault, has not appeared in our periodical works, inſtead of uſeleſs repetitions of well-known ſpecies, or trifling varieties. The *root* is certainly perennial, not annual. *Stems* annual, numerous, two or three feet high, ſometimes ſimple, but moſtly branched, leafy, angular.

*Leaves*

*Leaves* of four or five pair of elliptic-lanceolate briſtle-pointed leaflets, glaucous beneath, an inch and half long, with a ſmall linear-lanceolate terminal briſtle, or abortive leaflet. *Flower-ſtalks* longer than the leaves, each bearing from ſix to ten large drooping *flowers*, tinged with various ſhades of pale yellow and buff-colour. Cluſius calls them white, and the root annual. The figure in Dalechamp is better than his, but Gmelin's is the beſt. Miller's t. 193. f. 1. deſcribes the flowers as purple.

4. O. *vernus*. Spring Bitter-vetch. Linn. Sp. Pl. 1028. Curt. Mag. t. 521. (O. venetus; Cluſ. Hiſt. v. 2. 232. Ger. em. 1247.)—Leaves pinnate, with about three pair of ovate taper-pointed leaflets. Stipulas half-arrowſhaped, entire. Stem ſimple.—Native of mountainous woods, chiefly in the northern parts of Europe, though Dr. Sibthorp gathered it on mount Athos and the Bithynian Olympus. With us it is only a garden plant, but a very pretty one, conſpicuous in April or May for its broad bright-green *leaves*, and copious ſhowy *flowers*, variegated with crimſon and blue. A little ſhelter ſecures its beauty in the fickle ſpring of our climate.

5. O. *tuberoſus*. Common Bitter-vetch, or Heath Pea. Linn. Sp. Pl. 1028. Sm. Fl. Brit. n. 1. Engl. Bot. t. 1153. Curt. Lond. faſc. 1. t. 53. Fl. Dan. t. 781. (Aſtragalus ſylvaticus; Ger. em. 1237.)—Leaves pinnate, with about three pair of elliptic-lanceolate leaflets, ſtipulas half-arrow-ſhaped, toothed at the baſe. Stem winged.—Native of paſtures, woods and thickets, on a ſtrong foil, in the north of Europe more eſpecially. The *roots* are knobbed and perennial, much eſteemed by the Scottiſh Highlanders, for their ſweet taſte and nutritious qualities. The *herb* is about a foot high, with dark-green *leaflets*, which vary in breadth, and are ſometimes found quite linear. The *flowers* are racemoſe, large and handſome, with a browniſh and glaucous *calyx*, a ſtandard elegantly varied with purple, crimſon and blue, and pale wings.

6. O. *albus*. White Auſtrian Bitter-vetch. Linn. Suppl. 327. Willd. n. 6. (O. pannonicus; Jacq. Auſtr. t. 39.)—Leaves pinnate, with two pair of linear leaflets. Stipulas half-haſtate, lanceolate, entire. Stem without wings.—Native of Auſtria and Hungary. The *root* is perennial, furniſhed with many cylindrical knobs. *Stem* ſimple or branched, a foot or two high, angular, without wings. *Leaflets* two inches long and about a line wide, two pair on each common ſtalk. *Stipulas* lanceolate, entire, each with a ſmall horizontal lobe at the baſe. *Cluſters* on long ſtalks of about four white *flowers*, the ſize of the laſt. *Legume* compreſſed.

7. O. *anguſtifolius*. Siberian Narrow-leaved Bitter-vetch. Linn. Sp. Pl. 1028. Gmel. Sib. v. 4 14. t. 5.—Leaves pinnate, with two pair of linear ſword-ſhaped leaflets. Stipulas half-haſtate, awl-ſhaped, entire. Stem unbranched, without wings.—Native of Siberia. The *root* is unknown. *Stem* ſimple. *Leaflets* remarkably narrow, ſlightly hairy. *Stipulas* of two awl-ſhaped long lobes, one erect, the other horizontal. *Flowers* racemoſe, yellow in the Linnæan wild ſpecimen from Siberia, but Gmelin deſcribes them as purple. His figure is careleſsly drawn, and we ſuſpect he may have confounded with this plant the narrow-leaved variety of *O. tuberoſus*, as many others have done.

8. O. *ſeſſilifolius*. Oriental Seſſile-leaved Bitter-vetch. Sm. Prodr. Fl. Græc. Sibth. v. 2. 64. Fl Græc. t. 692, unpubliſhed. (O. orientalis, foliis anguſtiſſimis, coſtæ breviſſimæ innaſcentibus; Tourn. Cor. 26.)—Leaves in pairs, ſword-ſhaped, nearly ſeſſile. Stipulas awl ſhaped. Stems numerous, unbranched.—Gathered by Dr. Sibthorp about Athens and Meſſena. *Root* perennial, tapering, branched. *Stems* many, weak, unbranched, angular, without wings. *Leaves* of only one pair of narrow, dark-green, nearly ſeſſile *leaflets*. *Stipulas* very narrow, entire, half-arrowſhaped. *Flowers* dark-purple, about four in each cluſter.

9. O. *caneſcens*. Grey French Bitter-vetch. Linn. Suppl. 327. Willd. n. 8. (Arachi vel apios leguminoſæ ſpecies, Toſſano Carolo; Bauh. Hiſt. v. 2 326 cap. 21.)—Stem branched. Leaves pinnate, with two pair of linear-lanceolate leaflets. Stipulas half-arrowſhaped, awl-ſhaped.—Native of Burgundy. *Bauhin*. We know this merely from the authors cited, not having ſeen any ſpecimen. It is ſaid to differ from *O. anguſtifolius*, in having a branched *ſtem*, and whitiſh-blue *flowers*. The figure and deſcription of Bauhin anſwer very nearly to the narrow-leaved variety of the *tuberoſus*.

10. O. *varius*. Parti-coloured Bitter-vetch. Soland. MSS. Curt. Mag. t. 675. (O. anguſtifolius italicus, flore vario; Tourn. Inſt. 393. Aſtragalus quibuſdam, aracho Toſſani Caroli ſimilis; Bauh. Hiſt. v. 2. 326. cap. 22.)—Leaves pinnate, with about four pair of linear-lanceolate leaflets. Stipulas half-arrowſhaped, entire. Stem winged, branched above.—Native of Italy, near Bologna. A hardy perennial with us, eaſily propagated by offſets from the roots, and flowering abundantly in May or June, when its parti-coloured and very elegant bloſſoms are a great ornament to the parterre. Linnæus ſeems to have confounded this in his herbarium with *anguſtifolius*, from which it totally differs in its winged and branched *ſtem*, much broader and more numerous *leaflets*, and broader *ſtipulas*. The *flowers* are about ſix in each cluſter; their *calyx* red; *ſtandard* crimſon, fading to a pale yellow; *wings* and *keel* variegated with yellow and buff. Curtis ſays it rarely produces ſeed in England.

11. O. *atropurpureus*. Dark-purple Bitter-vetch. Deſf. Atlant. v. 2. 157. t. 196. Willd. n. 9.—Leaves pinnate, with about three pair of linear leaflets. Stipulas half-haſtate, ſomewhat toothed. Stem roundiſh, ſtriated. Flowers tubular.—Gathered by Desfontaines in neglected fields at Algiers. We have a Sicilian ſpecimen from Mr. Bivona Bernardi, which that excellent botaniſt was inclined to think a diſtinct ſpecies, becauſe the *ſtems* are more angular than Desfontaines repreſents. The *root* is perennial, rather woody. *Stems* twelve or eighteen inches high, roundiſh, but with ſome appearance of angles, ſtriated, either ſimple or branched. *Leaves* of two or three pair of linear, very narrow leaflets, on a common ſtalk an inch long. *Flowers* from four to twelve or more, in a denſe cluſter, turned one way, on a long ſtalk. *Corolla* about an inch in length, the pale claws of its *petals* remarkably long, cohering in a tubular manner, their limb deep purple or violet.

12. O. *niger*. Black Bitter-vetch. Linn. Sp. Pl. 1028. Willd. n. 10. (O. ſylvaticus, viciæ foliis; Riv. Tetrap. Irr. t. 60. Aſtragaloides; Ger. em. 1239.)—Stem branched. Leaves pinnate, with about ſix pair of ovate-oblong ſmooth leaflets.—Native of various parts of Europe, from Sweden to Greece, but not of Britain. We have long had it in curious gardens, flowering about June. The *ſtem* is erect, branched, two or three feet high, angular. *Leaves* copious, of about ſix pair of ovate, bluntiſh, awned, ſmooth leaflets, paler beneath, an inch long, on a common ſtalk tipped with a briſtle. *Cluſters* ſhortiſh, of from four to ſix dull purple *flowers*, their common ſtalk longer than the leaves. The whole plant turns black in drying.

13. O. *pyrenaicus*. Pyrenæan Bitter-vetch. Linn. Sp. Pl. 1029. Scop. Carn. v. 2. 59. O. pyrenaicus latifolius nervoſus; Pluk. Phyt. t. 210. f. 2.)—Stem branched. Leaves pinnate, with two pair of elliptical ribbed leaflets.

Stipulas

Stipulas ſomewhat ſpinous.—Native of the Pyrenées, and of Carniola. We have ſeen no ſpecimen. The *root* is marked as perennial. The *ſtem* is ſaid by Scopoli to be angular, and in ſome degree winged. *Leaflets* ovate-oblong, with ſlightly hairy ribs beneath. *Flowers* racemoſe, pendulous. *Standard* red, marked with darker lines. *Legume* ſlightly downy.

14. O. *ſylvaticus*. Tufted Wood Bitter-vetch. Linn. Sp. Pl. 1029. Sm. Fl. Brit. n. 2. Engl. Bot. t. 518. Lightf. Scot. 390. t. 16. (Vicia caſſubica; Fl. Dan. t. 98, but not of Linnæus.)—Stems branched, decumbent, hairy. Leaves pinnate, with numerous ovato-lanceolate, hairy leaflets. Stipulas half-arrowſhaped. Legume ovate, with about three ſeeds.—Native of the northern parts of Britain, as well as of Denmark and France, flowering in May or June. The *root* is ſtrong and perennial. *Stems* numerous, angular, proſtrate, branched after flowering. The very numerous and ſmall, hairy, ovate *leaflets* diſtinguiſh this ſpecies from all the foregoing. The *flowers* alſo are many in each cluſter, pale buff, veined with purple. But perhaps the moſt eſſential character conſiſts in the ſhortneſs and breadth of the *legume*, in which reſpect, as well as habit, this plant accords better with many *Viciæ* than with the preſent genus.

A truly wonderful variety of *O. ſylvaticus* was found by the late Mr. Todd, on hills near Hafod, Cardiganſhire, the admired ſeat of T. Johnes, eſq. M.P. In this the *leaves* are ſimple and ſolitary, from five to ten times the ſize of the uſual leaflets, and more obtuſe. Though this variety has been much cultivated, it has never yet been known to produce flowers.

15. O. *ochroleucus*. Buff Bitter-vetch. Willd. n. 13. Waldſtein and Kitaibel Pl. Rar. Hungar.—Stem branched, erect, hairy. Leaves pinnate, with numerous, ſmooth, elliptical leaflets. Stipulas ovato-lanceolate —Native of Hungary. We have ſeen no ſpecimen nor figure. Willdenow ſays it is like the laſt, but abundantly diſtinguiſhed by its erect, leſs hairy *ſtem*, ſmooth *leaflets*, and ovato-lanceolate *ſtipulas*. The *corolla* is pale ſulphur-coloured, or buff.

Profeſſor Martyn deſcribes four more ſpecies, which Miller received from Houſton; but they have not been admitted by any other writer, nor dare we adopt them without ſeeing ſpecimens in order to aſcertain their genus.

OROBUS, in *Gardening*, contains plants of the hardy, herbaceous, fibrous-rooted, perennial flowery kind, of which the ſpecies cultivated are: the upright bitter-vetch (O. lathyroides); the yellow bitter-vetch (O. luteus); the ſpring bitter-vetch (O. vernus); the tuberous bitter-vetch (O. tuberoſus); the black bitter-vetch (O. niger); and the Pyrenean bitter-vetch (O. pyrenaicus).

Of the third there are varieties with purple flowers, with pale blue flowers, with deep blue flowers.

The fourth ſort is ſometimes called *wood-pea* and *heath-pea*.

*Method of Culture*.—All the ſorts are capable of being increaſed by ſeeds and parting the roots. The ſeed ſhould be ſown in the beginning of the autumn, as in September or October, in the clumps, borders, or other parts where they are to remain, or on a bed of good earth, to be afterwards pricked out and tranſplanted. The plants ſhould be kept perfectly free from weeds.

The roots of the large plants may be parted in the autumn, and immediately planted out where the plants are to grow. The ſmall roots may be ſet in nurſery rows, to remain till ſufficiently ſtrong for being finally planted out.

They are all hardy flowering ornamental plants for the borders, clumps, and other parts of pleaſure grounds.

OROCONITES, in the *Materia Medica*, a name given by Hippocrates, and others, to a bulbous root that is recommended as a rich food. It has the name from the Greek ορος, *a mountain*, and κονιτες, *of a conic figure*. This ſhews that it was a root of ſuch a ſhape, found growing in mountainous places; but the learned have been puzzled in their attempts to find out what it was.

ORODADA, in *Geography*, a town of Peru, on the coaſt; ſix miles S.W. of Payta.

OROE, an iſland of Denmark, at the S. end of the Little Belt, about twelve miles long, and two wide; eight miles S.W. of the iſland of Funen. N. lat. 54° 59′. E. long. 10° 20′.

OROESKIOBING, a ſea-port of Denmark, ſituated on the E. ſide of the iſland of Oroe. N. lat. 54° 58′. E. long. 10° 23′.

OROMASDES, in *Mythology*. See OROSMADES.

OROMOECTO, in *Geography*, a river of New Brunſwick, which runs into St. John's river, N. lat. 45° 48′. W. long. 66° 40′, and by which the Indians have a communication with Paſſamaquoddy bay.

OROMTCHI, a town of Thibet; 48 miles E. of Manas-Hotun. N. lat. 44° 58′. E. long. 86° 44′.

ORON, or *Oron la Ville*, a town of Switzerland, in the canton of Berne; ſix miles N. of Vevai.

ORONDOCKS, an Indian tribe who live near Trois Rivières, and who could furniſh, between 30 and 40 years ago, 100 warriors.

ORONHI, a town of Thibet, 38 miles W. of Yolotou-Hotun.

ORONO'S ISLAND, a ſmall iſland in the river Penobſcot.

ORONSAY, one of the weſtern iſlands of Scotland, which is a ſmall iſland only at high water, on the N. coaſt of North Uiſt, of which it makes a part at low water. N. lat. 57° 39′. W. long. 7° 16′.

ORONTES, or AXIUS, a river of Syria, which ſprung towards N. lat. 33° 30′, between Libanus and Antilibanus, and ran into the Mediterranean, about ſix leagues below Antioch. It watered, in its courſe towards the north, Emeſa, Epiphania, Apamea, Antioch, and ſeveral other towns. This river was formerly the moſt conſiderable in Syria; but Volney repreſents it as a rivulet rather than a river. The channel of the Orontes, as well as that of the Jordan, ſays this traveller, are ſcarcely 60 paces wide at their mouths, and if the Orontes were not impeded by ſucceſſive obſtacles, it would be quite dry during the ſummer. It derives its importance in winter from rains and melted ſnows, but during the remainder of the year, its courſe would hardly be diſcovered if it were not marked by the round ſtones and fragments of rocks with which its bed is filled. This river, and alſo the other ſtreams of Syria, are nothing but torrents and caſcades; and it may be conceived, from the proximity of the mountains, among which they riſe, to the ſea, that their waters have not time to collect in long valleys, ſo as to form rivers. If the mouth of the Orontes were cleared, boats might be towed up this river, though they could not ſail up, on account of the rapidity of its ſtream; and thus Antioch would better ſerve as an emporium to the Europeans than Aleppo. The natives, who never knew the name Orontes, call it, on account of the ſwiftneſs of its ſtream, "El-Auſi," rendered by the Greeks "Axius," that is, the rebel. At Antioch its breadth is about 40 paces. Seven leagues above that town it paſſes by a lake abounding with fiſh, and eſpecially eels; great quantities of which are ſalted every year, though not ſufficient for the numerous faſts of the Greek Chriſtians.

Orontes, a mountain of Aſia, in Media, near Ecbatana. Ptolemy.

ORONTIUM, in *Botany*, ορόντιον of the Greeks, a name whoſe etymology is loſt in the darkneſs of antiquity. It is ſaid to have belonged to an herb uſed in baths, or fomentations, for the jaundice, and ſome have ſuſpected it to be a corruption of *Origanum*. Profeſſor Martyn ſuggeſts that the word may have come from ορᾶω, *to ſee*; which is founded on the ſuppoſition of the plant's being uſeful to the eye-ſight. The fame name has been given to a ſpecies of *Antirrhinum*; but this ſeems to have originated in the Dutch appellation of the laſt-mentioned genus, *orant*, eaſily aſſimilated to *Orontium*. Linnæus appears to have laid hold of it, as an unoccupied name, for the preſent genus, which Mitchell had called *Aronia*, from its partial reſemblance probably to *Arum*. Whether the ſimilarity of found led Linnæus to this application, we will not preſume to determine. Linn. Gen. 172. Schreb. 229. Willd. Sp. Pl. v. 2. 199. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 306. Juſſ. 25. Lamarck Illuſtr. t. 251.—Claſs and order, *Hexandria Monogynia*. Nat. Ord. *Piperitæ*, Linn. *Aroideæ*, Juſſ.

Gen. Ch. reformed. *Cal.* none, except the *bracteas* be taken for *ſpathas*. *Cor.* in ſix deep, concave, obtuſe, angular ſegments, inflexed at the points, the three alternate ones rather the ſmalleſt, permanent. *Stam.* Filaments ſix, inſerted into the ſegments of the corolla, flat, linear, equal, ſhorter than the corolla; anthers roundiſh, of two lobes, burſting at the top. *Piſt.* Germen ſuperior, large, roundiſh, depreſſed; ſtyle none; ſtigma roundiſh, cloven. *Peric.* Drupa roundiſh. *Seed.* Nut large, ſolitary, of a bony ſubſtance.

Eſſ. Ch. Corolla inferior, in ſix deep inflexed ſegments. Stamens flat, inſerted into the corolla. Style none. Drupa with one bony ſeed.

Obſ. We have endeavoured to correct the generic character, from a compariſon of both the known ſpecies. Dr. Buchanan met with a plant in Nepal, there called *Tilcuſta*, whoſe habit is preciſely that of *O. japonicum*, but the *bracteas* are very long, and the *fruit* a berry of three cells, with ſix ſeeds when in perfection, though indeed ſome of both are moſtly abortive.

1. O. *aquaticum*. Aquatic Orontium. Linn. Sp. Pl. 463. Amœn. Acad. v. 3. 17. t. 1. f. 3. Willd. n. 1. Ait. n. 1.—Leaves floating, ſtalked.—Native of rivers and pools in North America. Cultivated in ciſterns at Kew, where it flowers in June and July. The *root* is perennial, deſcending deep into the mud. *Herb* ſmooth, like a *Potamogeton* in its mode of growth. *Leaves* floating, elliptic-lanceolate, acute, entire, a ſpan long, with numerous parallel ribs. *Spikes* ſolitary, on long ſimple *ſtalks*, whitiſh under the ſpike, which is about an inch long, cylindrical, very denſe, of numerous, crowded, ſeſſile, greeniſh-white *flowers*, with a ſhort concave membranous *bractea* under each flower. The *germen* ſoon becomes very large, depreſſed, dark green, with a large white horny *ſeed*, which we have ſeen in a half-ripe ſtate only, ſo that we are not acquainted with the appearance or texture of the pericarp at an advanced period.

2. O. *japonicum*. Japan Orontium. Thunb. Japon. 144. Willd. n. 2. Ait. n. 2. Curt. Mag. t. 898. Banks Ic. Kæmpf. t. 12. (Kirò et Rirjo, vulgò Omotto; Kæmpf. Am. Exot. 785.)—Leaves erect, dilated and ſheathing at the baſe.—Native of Japan, growing in waſte ground, and allowed to occupy ſuch corners in gardens as would otherwiſe be bare. It is a hardy perennial at Kew, flowering very early in the ſpring. The *root* is thick and long, with numerous ſtrong ſimple fibres. *Stem* none. *Leaves* numerous, erect, coriaceous, ſmooth, ribbed, convoluted, about a foot high, with a dilated ſheathing baſe. *Spikes* ſolitary, on ſhort, ſimple, round, upright, radical *ſtalks*, each *ſpike* about an inch and half long, cylindrical, obtuſe, very denſe, of numerous, crowded, greeniſh-yellow *flowers*, the inflexed broad ſummits of whoſe crowded *petals* give the whole a teſſellated aſpect. Kæmpfer deſcribes the *fruit* the ſize and ſhape of a ſmall olive, ſcarlet, nauſeous, with a heart-ſhaped bony *ſeed*. The *bracteas* are ſhort, rounded, and membranous, like thoſe of the firſt ſpecies.

OROOLONG, in *Geography*, the name of one of the Pelew iſles, on which Capt. Wilſon was wrecked. See Pelew.

OROONOKO, Orinoko, or *Orinoco*, a large river of South America, diſtinguiſhed by its very ſingular and perplexed courſe. According to La Cruz it riſes in the ſmall lake of Ipava, N. lat. 5° 5′, and thence winds almoſt in a ſpiral form; firſt paſſing to the S.E. it enters the lake of Parima, and iſſues by two outlets on the N. and S. of that lake towards the W., but after receiving the Guaviari, it bends N., then N.E., till it enters the Atlantic ocean by an extended delta oppoſite to the iſle of Trinidad; but the chief eſtuary is conſiderably to the S.E. of that iſland. Many large rivers flow into the Oroonoko; and beſides its ſingular form, it has other remarkable peculiarities. From the S.E. of the lake of Parima, which ſeems to be a kind of inundation formed by the Oroonoko, the White river, called alſo that of Parima, joins the Black river, and thence the great flood of the Maranon. Another ſtream, called the Siaba, flows from the S.W. of the lake into the Black river, and joins another ſtream, which directly connects the Maranon with the Oroonoko. There is alſo a communication between the Black river and the Maranon, by the Joa Parana; ſo that there are three communications between theſe three great rivers. In the year 1800, the Pruſſian traveller, Humboldt, reſolved to explore the reported fact of the junction of the Oroonoko with the Maranon, by the great river Negro. He entered the Orinoco by the river Apuri, and after encountering many difficulties reached the fort of San Carlos, towards the Portugueſe frontier. From this fort he returned to the Orinoco by the river Caſiquiari, a very ſtrong branch of the Orinoco, which communicates with the river Negro. This navigation was rendered fatiguing and dangerous by the force of the current, the prodigious number of moſquitoes and ants, and the want of population, 300 leagues having been travelled by him without ſeeing a human countenance. He entered the Orinoco by the Caſiquiari at 3° 30′, and remounted the current of the Orinoco to Eſmeralda, the laſt Spaniſh ſettlement in that quarter. This remarkable communication had been marked in his map by Samſon de Fer, geographer to his Catholic majeſty in 1713, and confirmed by the able Condamine.

The mouths of the Orinoco are of perilous navigation, and require an expert pilot. Seven of them are navigable for large veſſels; but the chief is the great mouth, about ſix leagues wide, being the moſt ſouthern, and in the direct courſe of the river. The iſles of the Orinoco, or rather its Delta, which is of prodigious extent, are poſſeſſed by the Guaranos and the Mariuſas, two independent tribes of Indians. The river Caroni, running from the S. to the N. for nearly 100 leagues, is celebrated in the expedition of Raleigh. It preſerves its clearneſs for half a league after it joins the Orinoco, having moſtly run over a fine black ſand.

The beauty and grandeur of the banks of the Orinoco ſurpaſs all deſcription. Foreſts of the moſt ſuperb verdure are crowded with birds and monkies of the moſt various and

brilliant colours; and ſometimes immenſe plains form an horizon of 20 or 30 leagues. The annual inundation of the Orinoco begins in April and ends in Auguſt, and in the northern part ſometimes extends for 20 or 30 leagues, during a length of 200. This grand extent it will retain for the whole month of September. The uſual ſwell at San Tomé, or Old Guiana, founded in 1586, on the ſouthern bank of the Orinoco, 50 leagues from its mouth, but transferred in 1764 to a more ſafe poſition about 90 leagues from the ſea, is of 13 fathoms. In October the flood declines; and the river is loweſt in February. The Cayman, which is ſtrictly neither an alligator nor a crocodile, is a terrible inhabitant of the Orinoco.

During the great floods, the river Orinoco, where it paſſes a range of mountains at a place called Angoſtura or the ſtrait, riſes not leſs than 40 varas or Spaniſh yards. Of the ſavages on the Orinoco, Gumilla publiſhed, in 1745, an intereſting account. The nation of the Caberres exceeds the Caribs in courage and power. They are famous for the uſe of a mortal poiſon, and in his time were ſituated on the Guaviari. The Otomacs, in the ſame quarter, raiſe their dead after the expiration of 12 months, and tranſport the bones to a general tomb. Their women aſſerted that to cover their nakedneſs inſpired them with ſhame, as it led to ideas of turpitude unknown before. The Otomacs are accuſtomed to eat earth, as Humboldt has recently obſerved. But, in fact, they only preſerve their grain, fiſh, turtle, &c. in earth, and eat the whole mingled, ſo that a ſtranger would imagine that they devoured earth. This is done with a view to keep their victuals freſh; and the pieces afterwards dug from the pits reſemble bricks. Some of them are ſaid to eat 1½lb. of this earth *per* day. On the Orinoco moſt of the dialects are derived from the Betoya or Jirara, and the Cariba. Moſt of the tribes are ſmall, from 500 to 2000 warriors; but the Caribs boaſt of 12,000, and the Caberres were more numerous. The fury of the Caribs is not more deſtructive than domeſtic poiſon. Many mothers deſtroy their female children, to deliver them from the miſeries ſuffered by women in a ſavage ſtate; and they even regard this practice as an office of tender affection. If we except the Otomacs, the Caberres, and the Caribs, the other tribes moſtly flee when one or two fall in battle. All are deceitful and addicted to falſhood. In general, theſe ſavages bathe twice a day, thus obſerving a practice that conduces both to health and pleaſure. The mouth, or main channel of the Orinoco, is laid down in N. lat. 8° 30′. W. long. 59° 50′. Pinkerton's Geography, vol. iii.

Oroonoko, *Little*. See Mocomoco.

OROPESA, the capital of the juriſdiction of Cochabamba, in South America, ſituated on a ſmall river in a valley. The inhabitants trade with their corn and fruits, which are produced in conſiderable quantities in the valley, where their town is ſituated; 150 miles N.W. of La Plata. S. lat. 18° 15′. W. long. 67° 6′.—Alſo, a town of Spain, in New Caſtile; 52 miles W. of Toledo.—Alſo, a town of Spain, in Valencia, on the coaſt of the Mediterranean; 32 miles E.N.E. of Segorbe. N. lat. 40° 8′. W. long. 0° 4′.

Oropesa, *Cape*, a cape of Spain, on the coaſt of Valencia. N. lat. 40° 7′. E. long. 0° 1′.

OROPUS, in *Ancient Geography*, a town of Aſia, in Syria, ſaid to have been built by Nicator. Steph. Byz.—Alſo, a town of Macedonia.—Alſo, a town of Attica, near the ſea-coaſt. The inhabitants of this town were the firſt who reckoned Amphiaraus in the number of the gods, and the other Greeks followed their example. At 12 ſtadia from the town was a temple of this deity. Amphiaraus excelled in the interpretation of dreams, and he delivered his predictions in hexameter verſes.—Alſo, a town of Greece, in the iſland of Eubœa, in which was a temple conſecrated to Apollo.—Alſo, a town of the Peloponneſus, in the Argolide.—Alſo, a town of Greece, in Theſprotia, of which town Nicopolis was probably a part.

OROSEI, in *Geography*, a town of Sardinia, on the E. coaſt; 58 miles E. of Alghieri.

OROSIUS, Paul, in *Biography*, a prieſt of Tarragona, in Catalonia, flouriſhed in the beginning of the fifth century. He was in early life a diſciple of St. Auguſtin. In the year 414 he was ſent by two Spaniſh biſhops into Africa, to requeſt aid from St. Auguſtin againſt the heretics who diſturbed their churches. He remained a year with that prelate, and under his guidance made a great progreſs in the ſtudy of the ſcriptures. In 415 Oroſius was ſent by him on a miſſion to St. Jerome at Jeruſalem, and brought from thence into Africa a number of relics. It was at the deſire of St. Auguſtin that he undertook to write a hiſtory from the creation to the year 416, the object of which was to refute the calumnies of the Pagans againſt Chriſtianity. He accordingly compiled, in ſeven books, a view of general hiſtory, which he is ſaid to have entitled "De Miſeria Hominum." His ignorance of the Greek language involved him in many miſtakes. Oroſius was author likewiſe of "A Defence of the Freedom of the Will," againſt the Pelagians, and other works. The "Hiſtory" has gone through ſeveral editions, of which the beſt is, unqueſtionably, that of Havercamp, 1738. A tranſlation of it by our immortal Alfred is ſtill extant, in which it has the title "Hormeſta," but the reaſon for this change in the title has not been aſcertained. Bayle. Moreri.

OROSMADES, Oromasdes, or *Oromazes*, in *Mythology*, a deity among the Perſians, which is deemed the principle, or author of good, in the ſyſtem of Zoroaſter, revived by the Manichees. Oroſmades produced the good ſpirits and the ſtars, and encloſed them in an egg, which was broken by Arimanius; whence proceeded confuſion, and a mixture of good and evil. But after many conflicts the good deity totally vanquiſhes the evil one. See Arimanius.

OROSPEDA, or Ortospeda, in *Ancient Geography*, a mountain of Spain, in which were the ſprings of the river Bœtis, according to Strabo, who adds, that it was inhabited by the Oretani. This mountain is ſituated in the province of Grenada, on the borders of Seville.

OROSPIZA, in *Ornithology*, a name by which the ancient naturaliſts call the brambling, or mountain-finch.

The word is Greek, and expreſſes *mountain-chaffinch*. See Montifringilla.

OROSWEG, in *Geography*, a town of Hungary, the ſee of a biſhop; 8 miles N. of Munkacz.

OROVITZA, a town of Sclavonia; 14 miles N.N.E. of Poſzega.

OROUST, an iſland in the North ſea, near the W. coaſt of Sweden, 40 miles in circumference. N. lat. 58° 10′. E. long. 11° 30′.

ORPELLO, a preparation of braſs uſed in the glaſs trade, and prepared in this manner: cut plates of braſs into ſmall pieces, and place them in a luted crucible in a ſtrong fire, but not ſo violent as to melt it. Let it ſtand in this manner for four days, in which time it will be well calcined; when cold, powder and ſift it, and finally grind it on a porphyry. This will be a black powder; ſpread this on tiles, which place on burning coals in the leer, near the hole, for four days; take off the aſhes that may fall into it, and finally powder and ſift it fine for uſe. It is known to be

nicely prepared, when, on mixing with the melted metal in the glaſs furnace, it makes it ſwell and boil.

The colour it gives is a very elegant ſky-colour, and a ſea-green, or a mixt colour, between them, according to the quantity and degree of calcination. Neri's Art of Glaſs, p. 35.

ORPHAN, a child, or minor, deſtitute of father; or that has neither father nor mother.

Hence the Taborites, or followers of Ziſca, finding themſelves, at his death, without chief or conductor, took the appellation of *orphans*.

Among the Athenians, the orphans whoſe fathers had loſt their lives in the ſervice of their country, were under the guardianſhip of the polemarchus, who was to provide them with a competent maintenance out of the public treaſury.

In the city of London there is a court of record eſtabliſhed for the care and government of orphans. The lord-mayor and aldermen of London have the cuſtody of orphans under age, and unmarried, of freemen that die; and the keeping of all their lands and goods; and if they commit the cuſtody of an orphan to any man, he ſhall have a writ of *raviſhment of ward*, if the orphan be taken away; or the mayor and aldermen may impriſon the offender, until he produces the infant. If any one, without the conſent of the court of aldermen, marries ſuch an orphan under the age of twenty-one years, though out of the city, they may fine and impriſon him until paid.

Executors and adminiſtrators of freemen dying, are to exhibit true inventories of their eſtates before the lord-mayor and aldermen in the court of orphans, and give ſecurity to the chamberlain of London and his ſucceſſors, by recognizance, for the orphan's part; which if they refuſe to do, they may be committed to priſon until they obey.

The lord-mayor and commonalty of London being anſwerable for the orphans' money paid into the chamber of the city, and by ſome accidents become indebted to the orphans and their creditors, in a greater ſum than they could pay; it was enacted by 5 & 6 W. and M. cap. 10. that the lands, markets, fairs, &c. belonging to the city of London, ſhall be chargeable for raiſing 8000*l.* to be appropriated for a perpetual fund for orphans; and towards raiſing ſuch a fund, the mayor and commonalty may aſſeſs 2000*l.* yearly upon the perſonal eſtates of the inhabitants of the city, and levy the ſame by diſtreſs. A duty is alſo granted of 4*s.* *per* ton on wines imported, and on coals, and every apprentice ſhall pay 2*s.* 6*d.* when he is bound, and 5*s.* when he is admitted a freeman, for raiſing the fund, which is to be applied for payment of the debts due to orphans, by intereſt, after the rate of 4 *per cent.*

By the cuſtom of London, the ſhare of the children, or orphanage part, is not fully veſted in them till the age of twenty-one, before which they cannot diſpoſe of it by teſtament, and if they die under that age, whether ſole or married, their ſhares ſhall ſurvive to the other children; but after the age of twenty-one, it is free from any orphanage cuſtom, and, in caſe of inteſtacy, ſhall fall under the ſtatute of diſtributions. See CUSTOM *of London.*

ORPHAN *Iſland*, in *Geography*, an iſland of America, at the mouth of the Penobſcot, containing about 10,000 acres of excellent tillage land.

ORPHAN's *Bank*, a fiſhing-bank off the S.E. point of Chaleur's bay, on the N.E. coaſt of New Brunſwick, on which is from 75 to 30 fathoms water.

ORPHAN's *Iſland*, an iſland in lake Ontario, lying off the E. ſhore of Maryſburg, and near to it, in Traverſe bay.

ORPHANUS, in *Natural Hiſtory*, a name given by ſome authors to a poor ſpecies of opal, called by ſome *pſeudo-opalus*; it has no other colours beſide a milky-white, and purpliſh-red. This ſtone is frequent in Germany, and Hungary.

ORPHEON, a ſtringed inſtrument, turned with a wheel like the vielle, which it very much reſembles.

ORPHEORON, a ſtringed inſtrument of muſic, ſmaller than the pandora, but which it entirely reſembles. It is tuned like the lute: its higheſt or firſt ſtring is G.

ORPHEOTELISTÆ, Ορφεοτελισται, in *Antiquity*, perſons initiated in the Orphic myſteries. They aſſured all that were admitted into their ſociety of certain felicity after death. (See ORPHEUS.) At their initiation, little elſe was required of them beſides an oath of ſecrecy.

ORPHEUS, in *Grecian Hiſtory*, and *Mythology*, is one of the moſt ancient and venerable names among the poets and muſicians of Greece. His reputation was eſtabliſhed as early as the time of the Argonautic expedition, in which he was himſelf an adventurer: and is ſaid by Apollonius Rhodius, not only to have incited the Argonauts to row by the ſound of his lyre, but to have vanquiſhed and put to ſilence the Sirens, by the ſuperiority of his ſtrains. Yet, notwithſtanding the great celebrity he had ſo long enjoyed, there is a paſſage in Cicero, which ſays, that Ariſtotle, in the third book of his Poetics, which is now loſt, was of opinion that ſuch a perſon as Orpheus never exiſted; but as the work of Cicero, in which this paſſage occurs, is in dialogue, it is not eaſy to diſcover what was his own opinion upon the ſubject, the words cited being put into the mouth of Caius Cotta. And Cicero, in other parts of his writings, mentions Orpheus as a perſon of whoſe exiſtence he had no doubts. There are ſeveral ancient authors, among whom is Suidas, who enumerate five perſons of the name of Orpheus, and relate ſome particulars of each. And it is very probable that it has fared with Orpheus as with Hercules, and that writers have attributed to *one* the actions of *many*. But however that may have been, we ſhall not attempt to collect all the fables that poets and mythologiſts have invented concerning him. They are too well known to need inſertion here. We ſhall, therefore, in ſpeaking of him, make uſe only of ſuch materials as the beſt ancient hiſtorians, and the moſt reſpectable writers among the moderns, have furniſhed towards his hiſtory.

Dr. Cudworth, in his "Intellectual Syſtem," after examining and confuting the objections that have been made to the being of an Orpheus, and, with his uſual learning and abilities, clearly eſtabliſhing his exiſtence, proceeds, in a very ample manner, to ſpeak of the opinions and writings of our bard, whom he regards not only as the firſt muſician and poet of antiquity, but as a great mythologiſt, from whom the Greeks derive the Thracian religious rites and myſteries.

"It is the opinion," ſays he, "of ſome eminent philologers of later times, that there never was any ſuch perſon as Orpheus, except in Fairy-land; and that his whole hiſtory was nothing but a mere romantic allegory, utterly devoid of truth and reality. But there is nothing alleged for this opinion from antiquity, except the one paſſage of Cicero concerning Ariſtotle, who ſeems to have meant no more than this, that there was no ſuch poet as Orpheus anterior to Homer, or that the verſes vulgarly called Orphical were not written by Orpheus. However, if it ſhould be granted that Ariſtotle had denied the exiſtence of ſuch a man, there

ſeems to be no reaſon why his ſingle teſtimony ſhould preponderate againſt the univerſal conſent of all antiquity, which agrees, that Orpheus was the ſon of Oeager, by birth a Thracian, the father, or chief founder of the mythological and allegorical theology amongſt the Greeks, and of all their moſt ſacred religious rites and myſteries; who is commonly ſuppoſed to have lived before the Trojan war, that is, in the time of the Iſraelitiſh judges, or at leaſt to have been ſenior both to Heſiod and Homer, and to have died a violent death, moſt affirming that he was torn in pieces by women. For which reaſon, in the viſion of Herus Pamphylius, in Plato, Orpheus's ſoul, paſſing into another body, is ſaid to have choſen that of a ſwan, a reputed muſical animal, on account of the great hatred he had conceived for all women, from the death which they had inflicted on him. And the hiſtoric truth of Orpheus was not only acknowledged by Plato, but alſo by Iſocrates, who lived before Ariſtotle, in his oration in praiſe of Buſiris; and confirmed by the grave hiſtorian, Diodorus Siculus, who ſays, that Orpheus diligently applied himſelf to literature, and when he had learned τα μυθολογεμενα, or the mythological part of theology, he travelled into Egypt, where he ſoon became the greateſt proficient among the Greeks, in the myſteries of religion, theology, and poetry. Neither was this hiſtory of Orpheus contradicted by Origen, when ſo juſtly provoked by Celſus, who had preferred him to our Saviour; and, according to Suidas, Orpheus the Thracian was the firſt inventor of the religious myſteries of the Greeks, and that religion was thence called Threſkeia, as it was a Thracian invention. On account of the great antiquity of Orpheus, there have been numberleſs fables intermingled with his hiſtory, yet there appears no reaſon that we ſhould diſbelieve the exiſtence of ſuch a man."

The biſhop of Glouceſter ſpeaks no more doubtfully of the exiſtence of Orpheus, than of Homer and Heſiod, with whom he ranks him, not only as poet, but alſo as a theologian, and founder of religion. This learned author has thrown new lights upon the character of Orpheus; our purſuits are ſomewhat different; it was his buſineſs to introduce him to his readers as a philoſopher, a legiſlator, and a myſtagogue; and it is ours, after eſtabliſhing his exiſtence, to rank him among the firſt cultivators of muſic and poetry, and to give him that exalted and reſpectable ſtation among illuſtrious bards, which has been allowed him by almoſt all antiquity.

The family of Orpheus is traced by ſir Iſaac Newton for ſeveral generations: "Seſac paſſing over the Helleſpont, conquers Thrace, kills Lycurgus, king of that country, and gives his kingdom, and one of his ſinging women, to Oeagrus, the ſon of Tharops, and father of Orpheus; hence Orpheus is ſaid to have had the muſe Calliope for his mother."

He is allowed by moſt ancient authors to have excelled in poetry and muſic, particularly the latter, and to have early cultivated the lyre, in preference to every other inſtrument; ſo that all thoſe who came after him were contented to be his imitators; whereas he adopted no model, ſays Plutarch; for before his time no other muſic was known, except a few airs for the flute. Muſic was ſo cloſely connected in ancient times with the moſt ſublime ſciences, that Orpheus united it not only with philoſophy, but with theology. He abſtained from eating animal food, and held eggs in abhorrence as aliment, being perſuaded that the egg ſubſiſted before the chicken, and was the principle of all exiſtence: both his knowledge and prejudices, it is probable, were acquired in Egypt, as well as thoſe of Pythagoras, many ages after.

The paſſage in which Ariſtotle is ſaid to have denied the exiſtence of Orpheus is loſt, and it now reſts on Cicero's quotation, who afterwards, in other works, reſtores him to life. With reſpect to his abſtaining from the fleſh of oxen, Geſner ſuppoſes it to have proceeded from the veneration ſhewn to that animal, ſo uſeful in tillage, in the Eleuſinian myſteries, inſtituted in honour of Ceres, the goddeſs of agriculture. And with reſpect to theology, Diodorus Siculus tells us that his father Oeagrus gave him his firſt inſtructions in religion, imparting to him the myſteries of Bacchus, as they were then practiſed in Thrace. He became afterwards a diſciple of the Idæi Dactyli, in Crete, and there acquired new ideas concerning religious ceremonies. But nothing contributed ſo much to his ſkill in theological matters as his journey into Egypt, where, being initiated into the myſteries of Iſis and Oſiris, or of Ceres and Bacchus, he acquired a knowledge concerning initiations, expiations, funeral rites, and other points of religious worſhip, far ſuperior to any one of his age or country. And being much connected with the deſcendants of Cadmus, the founder of Thebes in Bœotia, he reſolved, in order to honour their origin, to tranſport into Greece the whole fable of Oſiris, and apply it to the family of Cadmus. The credulous people eaſily received this tale, and were much flattered by the inſtitution of the ceremonies in honour of Oſiris. Thus Orpheus, who was held in great veneration at the Grecian Thebes, of which he was become a citizen, admirably adapted this fable, and rendered it reſpectable, not only by his beautiful verſes, and manner of ſinging them, but by the reputation he had acquired of being profoundly ſkilled in all religious concerns.

At his return into Greece, according to Pauſanias, he was held in the higheſt veneration by the people, as they imagined he had diſcovered the ſecret of expiating crimes, purifying criminals, curing diſeaſes, and appeaſing the angry gods. He formed and promulgated an idea of a hell, from the funeral ceremonies of Egyptians, which was received throughout all Greece. He inſtituted the myſteries and worſhip of Hecate among the Eginetes, and that of Ceres at Sparta.

Profane authors look upon Orpheus as the inventor of that ſpecies of magic, called *evocation of the manes*, or raiſing ghoſts; and indeed the hymns which are attributed to him are moſtly pieces of incantation and real conjuration. Upon the death of his wife Eurydice, he retired to a place in Theſprotia, called Aornos, where an ancient oracle gave anſwers to ſuch as evoked the dead. He there fancied he ſaw his dear Eurydice, and at his departure flattered himſelf that ſhe followed him; but upon looking behind him, and not ſeeing her, he was ſo afflicted, that he ſoon died of grief.

There were perſons among the ancients who made public profeſſion of conjuring up ghoſts, and there were temples where the ceremony of conjuration was to be performed. Pauſanias ſpeaks of that which was in Theſprotia, where Orpheus went to call up the ghoſt of his wife Eurydice. It is this very journey, and the motive which put him upon it, that made it believed he went down into hell.

The poets have embelliſhed this ſtory, and given to the lyre of Orpheus, not only the power of ſilencing Cerberus, and of ſuſpending the torments of Tartarus, but alſo of charming even the infernal deities themſelves, whom he rendered ſo far propitious to his intreaties, as to reſtore to him Eurydice, upon condition that he would not look at her, till he had quitted their dominions; a bleſſing which he ſoon forfeited, by a too eager and fatal affection.



"All

" All dangers paſt, at length the lovely bride
In ſafety goes, with her melodious guide;
Longing the common light again to ſhare,
And draw the vital breath of upper air:
He firſt, and cloſe behind him follow'd ſhe,
For ſuch was Proſerpine's ſevere decree.
When ſtrong deſires the impatient youth invade,
By little caution, and much love betrayed:
A fault which eaſy pardon might receive,
Were lovers judges, or could hell forgive.
For near the confines of etherial light,
And longing for the glimmering of a ſight,
Th' unwary lover caſt a look behind,
Forgetful of the law, nor maſter of his mind.
Straight all his hopes exhal'd in empty ſmoke;
And his long toils were forfeit for a look."

Dryden's Virgil.

Tzetzes explains the fable of his drawing his wife Euridice from hell by his great ſkill in medicine, with which he prolonged her life, or, in other words, ſnatched her from the grave. Æſculapius and other phyſicians have been ſaid to raiſe from the dead thoſe whom they had recovered from dangerous diſeaſes.

The biſhop of Glouceſter, in his learned and admirable account of the Eleuſinian myſteries, ſays, " While theſe myſteries were confined to Egypt, their native country, and while the Grecian lawgivers went thither to be initiated, as a kind of deſignation to their office, the ceremony would be naturally deſcribed in terms highly allegorical. This way of ſpeaking was uſed by Orpheus, Bacchus, and others; and continued even after the myſteries were introduced into Greece, as appears by the fables of Hercules, Caſtor, Pollux, and Theſeus's deſcent into hell; but the allegory was ſo circumſtanced, as to diſcover the truth concealed under it. So Orpheus is ſaid to get to hell by the power of his harp:

" Thrëichius fretus citharâ, fidibuſque canoris."

Virg. Æn. vi. ver. 119.

that is, in quality of lawgiver; the harp being the known ſymbol of his laws, by which he humanized a rude and barbarous people. Had an old poem, under the name of Orpheus, entitled " A Deſcent into Hell," been now extant, it would perhaps have ſhewn us, that no more was meant than Orpheus's *initiation*."

Many ancient writers, in ſpeaking of his death, relate, that the Thracian women, enraged at being abandoned by their huſbands, who were diſciples of Orpheus, concealed themſelves in the woods, in order to ſatiate their vengeance; and, notwithſtanding they poſtponed the perpetration of their deſign ſome time through fear, at length, by drinking to a degree of intoxication, they ſo far fortified their courage as to put him to death. And Plutarch aſſures us, that the Thracians ſtigmatized their women, even in his time, for the barbarity of this action.

Our venerable bard is defended by the author of the " Divine Legation," from ſome inſinuations to his diſadvantage in Diogenes Laertius. " It is true," ſays he, " if uncertain report was to be believed, the myſteries were corrupted very early; for Orpheus himſelf is ſaid to have abuſed them. But this was an art the debauched myſtæ of later times employed to varniſh their enormities; as the deteſted pederaſts of after ages ſcandalized the blameleſs Socrates. Beſides, the ſtory is ſo ill laid, that it is detected by the ſureſt records of antiquity: for in conſequence of what they fabled of Orpheus in the myſteries, they pretended he was torn in pieces by the women; whereas it appeared from the inſcription on his monument, at Dium in Macedonia, that he was ſtruck dead by lightning, the envied death of the reputed favourites of the gods."

This monument, at Dium, conſiſting of a marble urn on a pillar, was ſtill to be ſeen in the time of Pauſanias. It is ſaid, however, that his ſepulchre was removed from Libethra, upon mount Olympus, where Orpheus was born, and was thence transferred to Dium by the Macedonians, after the ruin of Libethra, by a ſudden inundation, which a dreadful ſtorm had occaſioned. This event is very minutely related by Pauſanias.

Virgil beſtows the firſt place in his Elyſium upon the legiſlators, and thoſe who brought mankind from a ſtate of nature into ſociety.

" Magnanimi heroës, nati melioribus annis."

At the head of theſe is Orpheus, the moſt renowned of the European lawgivers; but better known under the character of poet: for the firſt laws being written in meaſure, to allure men to learn them, and, when learnt, to retain them, the fable would have it, that by the force of harmony, Orpheus ſoftened the ſavage inhabitants of Thrace:

" —— Thrëicius longa cum veſte ſacerdos
Obloquitur numeris ſeptem diſcrimina vocum:
Jamque eadem digitis, jam pectine pulſat eburno."

Æn. lib. vi. ver. 645.

The ſeven ſtrings given by the poet in this paſſage to the lyre of Orpheus, is a circumſtance ſomewhat hiſtorical. The firſt Mercurian lyre had, at moſt, but four ſtrings. Others were afterwards added to it by the ſecond Mercury, or by Amphion; but, according to ſeveral traditions preſerved by Greek hiſtorians, it was Orpheus who completed the ſecond tetrachord, which extended the ſcale to a heptachord, or *ſeven ſounds*, implied by the *ſeptem diſcrimina vocum*: for the aſſertion of many writers, that Orpheus added two new ſtrings to the lyre, which before had ſeven, claſhes with the claims of Pythagoras to the invention of the octachord, or addition of an eighth ſound to the heptachord, which made the ſcale conſiſt of two disjunct, inſtead of two conjunct tetrachords, and of which almoſt all antiquity allows him to have been the inventor. Nor is it eaſy to ſuppoſe, that the lyre ſhould have been repreſented in ancient ſculpture with four or five ſtrings only, if it had had nine ſo early as the time of Orpheus, who flouriſhed long before ſculpture was known in Greece.

Orpheus is mentioned by Pindar in his fourth Pythic. The paſſage is curious: " Orpheus," ſays he, " ſpeaking of the Argonauts, joins theſe heroes; Orpheus, father of the lyre and of ſong; Orpheus, whom the whole univerſe celebrates, and whoſe lire is Apollo." Herodotus likewiſe ſpeaks of the Orphic myſteries. His hymns, ſays Pauſanias, were very ſhort, and but few in number; the Lycomides, an Athenian family, knew them by heart, and had an excluſive privilege of ſinging them, and thoſe of their old poets, Muſæus, Onomacritus, Pamphus, and Olen, at the celebration of the Eleuſinian myſteries; that is, the prieſthood was hereditary in this family.

Iamblicus tells us, that the poems under the name of Orpheus were written in the Doric dialect, but have ſince been trans-dialected, or moderniſed. It was the common opinion in antiquity that they were genuine; but even thoſe who doubted of it, gave them to the earlieſt Pythagoreans, and ſome of them to Pythagoras himſelf, who has frequently been

been called the follower of Orpheus, and been ſuppoſed to have adopted many of his opinions.

If we have ſelected with too much ſedulity and minuteneſs whatever ancient and modern writers relative to Orpheus have ſaid, it has been occaſioned by an involuntary zeal for the fame of this muſical and poetical patriarch; which, warm at firſt, grew more and more heated in the courſe of enquiry; and ſtimulated by the reſpect and veneration which we found paid to him by antiquity, we became a kind of convert to the myſtagogue, and eagerly aſpired at initiation into his myſteries, in order to reveal them to our reader.

The true doctrine of Orpheus on the ſubject of Coſmogmy is ſaid to be contained in an epitome made long ago by Timotheus, the chronographer. This writer ſays, that Orpheus gave an account of the generation of the gods, the creation of the world, and the formation of man, profeſſing, that he delivered nothing from his own invention, but as he was informed, on inquiry, by Phœbus, Titan, or the Sun. His account is briefly as follows: that in the beginning the ether, or heaven, was formed by God; and that on each ſide of the ether were chaos and dark night, which covered whatſoever was under the ether, thereby ſignifying, that night was prior. He declared alſo, that there was a certain incomprehenſible being, which was the higheſt and moſt ancient of all things, and the maker of the univerſe, both of the ether itſelf, and of things under the ether; that the earth was inviſible by reaſon of the darkneſs which was upon it; but the light, breaking forth through the ether, illuminated the whole creation; this light, which ſo broke forth, being ſaid by him to be that higheſt of all beings before-mentioned, whoſe name, as revealed by the oracle, was Counſel, Light, and the Giver of Life: that theſe three names manifeſt one and the ſame power and might of that inviſible and incomprehenſible God, who is the maker of all things, and who bringeth that which is not, into a ſtate of exiſtence; by which power were procured all incorporeal principles, and the ſun, the moon, the ſtars, the earth, and the ſea, and all things therein, both viſible and inviſible. He likewiſe declared, that mankind was formed out of the earth by the ſame Deity, and received from him a rational ſoul, agreeably to what Moſes has recorded. Timotheus adds, that the ſame Orpheus alſo wrote, that all things were made by one godhead of three names, and that this God is all things. (Timoth. Chronogr. apud Euſeb. Chron. Græc. Vide etiam Suidam, in voce Orpheus; and Procl. in Tim. lib. ii.) If this teſtimony be admitted, we need not appeal to the Orphic verſes, which are very full as to the aſſertion of a Supreme Deity. Many of theſe verſes, it is true, are ſuppoſititious, and manifeſtly forged either by Chriſtians or Jews; but the ſame cannot be ſaid of them all: ſeveral being cited by Pagan authors, as having been written, if not by Orpheus himſelf, yet by perſons of great antiquity, and well acquainted with his doctrine and traditions, and, therefore, thought, by men of good learning and judgment, genuine, and worthy of ſome regard. (Cudworth Intel. Syſt.) However, Orpheus's theology has been preferred to that of the other heathens by the Chriſtian fathers; and an ingenious writer (Burnet, Archæolog. lib. i.) has ſurmiſed, that his eſtabliſhing of polytheiſm was owing rather to the neceſſity he was under of complying with the ſtupidity of the barbarous people, whom he firſt civilized, than his own approbation; being obliged to give them, not the religion which he himſelf beſt approved, but ſuch a one as they were capable of receiving. It is further obſervable with regard to the doctrine of this ancient poet, that he was the firſt who taught the Greeks the doctrine of the primitive egg, whence all other beings proceeded (Plut. in Symp. Macrob. Sat. l. vii. c. 16.); an opinion very ancient, which, without doubt, he had learned from the Egyptians, who, as well as thoſe of ſeveral other nations, repreſented the world under this emblem. This ſymbol was adopted and employed by the Phœnicians, Chaldeans, Perſians, Indians, and even the Chineſe; nor is it improbable, that this was the primary opinion of all who undertook to explain the formation of the world.

Brucker, in his "Hiſtory of Philoſophy by Enfield," (vol. i.) has deduced from the Orphic verſes and other fragments of Orpheus the following ſummary of the doctrine of Orpheus concerning God and nature. "God, from all eternity, contained within himſelf the unformed principles of the material world, and conſiſted of a compound nature, active and paſſive. By the energy of the active principle, he ſent forth from himſelf, at the commencement of a certain finite period, all material and ſpiritual beings, which partake, in different degrees, of the divine nature. All beings, proceeding originally from God, will, after certain purgations, return to him. The univerſe itſelf will be deſtroyed by fire, and afterwards renewed." He adds, an Orphic fragment is preſerved by Athenagoras, in which the formation of the world is repreſented under the emblem of an egg; formed by the union of night, or chaos, and ether, which at length burſt, and diſcloſed the forms of nature. The meaning of this allegory probably is, that by the energy of the divine active principle upon the eternal maſs of paſſive matter, the viſible world was produced. Some writers have aſcribed to Orpheus the doctrine ſince maintained by Spinoza, which confounds the Deity with the Univerſe, making him the To Παν. But the doctrine of emanation, which ſuppoſes that the principles of all things were originally in God, and at length flowed from him, is conſonant to the general tenor of the Orphic fragments, and is the more likely to have been the real doctrine of Orpheus, as it prevailed, in the moſt remote times, through the Eaſt, and paſſed thence to the North. The human ſoul, Orpheus, after the Thracians and Egyptians, from whom he derived his philoſophy, held to be immortal. Diodorus Siculus relates, that he was the firſt who taught (that is, among the Greeks) the doctrine of the future puniſhment of the wicked, and the future happineſs of the good. That this doctrine was commonly received among the followers of Orpheus appears from the ſubjoined anecdote. A prieſt of Orpheus, who was exceedingly poor and wretched, boaſting to Philip of Macedon that all who were admitted into the Orphic myſteries would be happy after death; Philip ſaid to him, "Why then do you not immediately die, and put an end to your poverty and miſery?"

The planets and the moon, Orpheus conceived to be habitable worlds, and the ſtars to be fiery bodies like the ſun: he taught that they are animated by divinities; an opinion which had been commonly received in the Eaſt, and which was afterwards adopted by the Pythagoreans, and other Grecian philoſophers.

Orpheus, in *Ichthyology*, the name of a fiſh caught in the Archipelago. It is of a broad and flat figure, and of a fine purple colour; its eyes are large and prominent, and its teeth ſerrated; it has only one fin on the back, and the anterior rays of that are prickly, and others ſoft to the touch; its anus is ſmall, and is ſaid to have no paſſage for the ſemen.

This was the fiſh called orpheus by the ancients, but the modern Greeks call another fiſh by that name. It is a ſpecies of the ſparus, of a flat figure, but very thick, has a ſmall mouth, and is covered with ſmall, but very rough ſcales,

ſcales, which adhere very firmly to the fleſh; the tail is not forked; it has fleſhy lips, and very ſmall teeth; its back and ſides are black; its belly white; it has a large black ſpot at the root of the tail; its head is reddiſh, and its fins are very elegantly diverſified with various colours; it has only one back-fin, and that has the anterior ray prickly, the hinder ones not at all ſo. It grows ſometimes to twenty pounds weight, and is much eſteemed among the modern Greeks.

ORPHIGNES, Fr. *Orphics*, in *Literature* and *Hiſtory*. By orphics are generally underſtood the poems and detached verſes which the ancients and moderns have aſcribed to Orpheus.

ORPIERRE, in *Geography*, a town of France, in the department of the Higher Alps, and chief place of a canton, in the diſtrict of Gap; 7 miles S. of Serres. The place contains 858, and the canton 2965 inhabitants, on a territory of 115 kiliometres, in eight communes.

ORPIMENT, in *Chemiſtry* and the *Arts*, a yellow mineral, from which the colour called king's yellow is prepared. It is a compound of ſulphur and arſenic. See ARSENIC, *Sulphuret of*.

ORPINE, in *Botany*, &c. See SEDUM and TELEPHIUM.

ORR, in *Geography*, a town of Arabia, in the province of Yemen, the reſidence of a Dola; 24 miles W.S.W. of Sana.

ORR *Water*, a river of Scotland, which runs into Solway Frith, 10 miles E. of Kircudbright, N. lat. 54° 55'. W. long. 3° 50'.

ORRA, a mountain of Arabia, in Yemen; 20 miles N.E. of Abu-Ariſch.

ORRACH, or ORACH, in *Botany*. See ORACH.

ORRERY, in *Aſtronomy*, a machine for repreſenting by wheelwork the various motions of the heavenly bodies. This machine differs from a planetarium in this reſpect, that it exhibits the diurnal as well as annual motions of the earth, the revolution of our moon, and ſometimes the rotation of the ſun and of certain planets on their axes, as well as the revolutions of the latter, whereas a planetarium produces only the revolutions of the primary planets round the ſun. The larger, or what has been called the "Grand Orrery," exhibits moreover the motions of the ſecondary planets, but more particularly thoſe of Jupiter. To conſtitute an orrery, it is not neceſſary, however, that the motions of all the primary planets ſhould be included, provided the different motions of our planet, the earth, and of her ſecondary, the moon, be included; becauſe on theſe motions depend all the problems that relate to geography, navigation, and aſtronomy, the earth being the ſituation, though a moveable ſituation, from which all the phenomena are viewed, that ſucceſſively ariſe out of the different motions of the other diſtant bodies, conſidered as contemporary with the motions of the earth herſelf. Hence all the viciſſitudes of ſummer and winter, of ſpring and autumn, of day and night, the riſings, ſettings, and culminating of the heavenly bodies, together with their conſtantly varying altitudes and azimuths, their right aſcenſions, declinations, and amplitudes, their conjunctions and oppoſitions, their tranſits and occultations or eclipſes, conſtitute matter of illuſtration for the orrery, which renders it a machine of the firſt importance in ſcience; and when all the wheelwork is ſo accurately calculated and properly arranged, that the motions in the machine are exact repreſentations of the true motions of the heavenly bodies themſelves, it affords one of the moſt pleaſing, as well as inſtructive, objects of contemplation that human ingenuity has contrived, inaſmuch as it comprehends in miniature the outlines of the whole ſolar ſyſtem, and explains in a familiar manner a multiplicity of intereſting particulars relating to the compoſition of the univerſe; particulars which have required centuries to diſcover, and the ſkill of ſucceſſive mathematicians ſatisfactorily to explain.

It is not our intention to give in this place a hiſtory of all the machines that have been contrived by human ſkill, to illuſtrate the different ſyſtems of planetary motion, which the ancient philoſophers of different nations adopted, as the reſult of their imperfect obſervations and reaſoning; many of which will be introduced in hiſtorical order, under our more general article PLANETARY *Machines*, to which the reader is referred; but to deſcribe ſuch machines only, as illuſtrate the true or Copernican ſyſtem, agreeably to the definition we have given of an *orrery*, as diſtinguiſhed from a *planetarium*, the latter of which will alſo be fully deſcribed in its place. See PLANETARIUM.

The internal conſtruction of an orrery has hitherto been conſidered as compoſed of mechaniſm too complex to be intelligibly deſcribed in a dictionary of the arts and ſciences, but we flatter ourſelves, that our diviſion of the different planetary machines into appropriate articles, and our having deſcribed the theory of planetary calculations, and of planetary mechaniſm under the heads EQUATION *Mechaniſm*, and NUMBERS *Planetary*, will enable us to remove objections of this nature, and to render perfectly intelligible, not only the effect produced by any particular contrivance, but the reſults accruing from the united agencies of all the mechanical parts of any of the machines, that appear to be worthy of minute deſcription.

The appellation of *orrery* conveys in itſelf no idea indicative of the nature or uſe of the machine that it deſignates, but aroſe out of the following circumſtance. About the year 1715 an inſtrument was contrived and made by Mr. George Graham, that repreſented at the ſame time both the annual and diurnal motions of the earth, and alſo the ſynodic period of the moon, which motions had never before been exhibited together by any mechanical contrivance, at leaſt in England. This inſtrument was put into the hands of a workman to be packed and ſent to prince Eugene, along with ſome other inſtruments. Whether this workman was Rowley, or ſome other perſon employed by him, does not appear; but it is ſaid that he copied the model put into his hands, and from it Rowley made a machine for the *earl* of *Orrery*, with additions of his own invention. Sir Richard Steel, who knew nothing of Mr. Graham's inſtrument, wiſhing to do juſtice to the inventor, as he thought, of ſuch an ingenious and complicated piece of mechaniſm, named it an *orrery*, and attributed to Rowley the honour which was due to Graham. This is Dr. Deſaguliers's account of the origin of the orrery, from which it may be inferred, that Graham invented the parts of the machine which relate to the earth and moon, and that Rowley added thoſe which produce the motions of the other planets; but whether the inferior planets only, or the ſuperior alſo, were at firſt added, does not certainly appear. We have been favoured with a minute inſpection into, and examination of, the orrery that was made from Rowley's plan many years ago for an Indian nabob, by order of the Eaſt India company, but which was never ſent out by reaſon of the ſaid nabob's death. This machine has not the wheelwork for exhibiting the ſuperior planets, but correſponds with the drawing given in Bion's book of mathematical inſtruments, and alſo with the ſhort notice which is there given of its external parts and uſe. The caſe is of ebony, ſurmounted by an ecliptic circle of ſolid ſilver, 1⅝ inches broad and 29 inches in diameter, on which are neatly engraved the graduated ſigns of the eclip-

tic,

tic, and a circle of declination, but no months, or days of the month: this ecliptic circle is ſupported by twelve pillars, apparently of ſolid ſilver, and the twelve ſides of the caſe have each an appropriate animal of ſilver to correſpond to the twelve ſigns; the intervening corners being ornamented with as many ſilver pilaſters, each ſix inches long, in the form of caryatides. Theſe expenſive ornaments around the exterior of the caſe, are calculated to raiſe the expectation that the interior parts may have been contrived and arranged with peculiar attention to accuracy, but the account we have to ſubjoin, we fear, will diſappoint the reader. It would not be an eaſy matter to convey, by a verbal deſcription, a clear notion of the relative ſituations and proportions of all the wheels, pinions, bars, and other internal parts of the mechaniſm, as preſented to the eye when the cover is removed; nor is it neceſſary in order to give a true account of their accuracy; but our examination of the numbers of teeth contained in the various wheels and pinions, and of the manner in which thoſe moſt eſſential parts are placed to perform their reſpective offices, has enabled us to make ſuch a correct report, as we truſt will be intelligible to ſuch of our readers as have peruſed with attention our article NUMBERS *Planetary*, where the different modes of appreciating the value of wheelwork, acting under different circumſtances, are exemplified.

We propoſe to deſcribe Graham's portion of the machine firſt, as being the moſt eſſential, as well as of prior date, and then to add our deſcription of Rowley's, together with ſuch remarks as ſeem neceſſary to explain the conſtruction of each portion.

*Graham's Portion.*—In examining this orrery, we began our operations by finding out what ſort of connection the handle has with the diurnal motion of the earth, which motion, in all machines of this nature, is made the ſtandard by which all the other periods are examined and eſtimated. We found fifteen wheels and pinions employed in communicating the motion of the handle to the earth's axis: but as none of theſe were found to be concerned in the train conſtituted of the ratio between a day and a year, they are no otherwiſe worthy of particular notice, than as being many of them ſuperfluous, and as giving a falſe reckoning of the number of the earth's diurnal rotations. In order to indicate ſolar time correctly, it is neceſſary that the hour index on the earth's axis, or wherever it is placed, ſhould revolve round a fixed face once in every rotation of the earth round its axis, or otherwiſe, that the face ſhould revolve, with a fixed index, in this period: but in the inſtance before us, the handle or arbor of the index is in a ſtationary poſition, while it is connected, by the intervention of the wheels in queſtion, with the earth's axis, as borne by the annual bar, and placed therefore in a variable ſituation, as it regards the ſun, the centre of its motion; from which arrangement an annual difference of four entire days ariſes in the motions of the handle and of the earth; which may be thus explained: one of the wheels, which takes the motion of the handle, and conveys it to the earth's annual arm, is neceſſarily concentric with the ſun's ſtem, and has the ſaid arm revolving round it in a year; its number of teeth is 96, and the pinion which it actuates has 24 teeth: this pinion has its teeth in action with thoſe of wheel 96, while it is carried round in the annual orbit, and therefore experiences a ſubtraction of $\frac{96}{24}$, or four entire revolutions, not contemplated by the contriver, or if contemplated not remedied; which ſubtraction, acting in a direction contrary to that of the motion derived from the handle alone, makes the earth have four rotations in the year fewer than the index counts on the horary circle. The error thus occaſioned in the indication of time, however, attaches fortunately to the handle, and not to the earth's axis, the motion of which is governed by the annual train. We notice this circumſtance the more particularly, becauſe Bion has given an erroneous account of this part of the mechaniſm, when he ſays, that "one entire turn of the handle of this inſtrument anſwers to the diurnal motion of the earth about its axis," which aſſertion has hitherto been generally credited. Nay, to an accurate examiner it is evident, without an inſpection of the means, that a correct effect is not produced in counting time by the hour plate, for the circle of hours placed at the earth's axis makes 91 revolutions only, while the handle makes 92 nearly. But this error is not of ſo much importance in the motion of the handle as it would have been in the earth, or hour circle, while the two latter are correſpondent. The wheelwork, which conſtitutes the effectual part of the ratio between a year and a day, are $\frac{18}{24} \times \frac{481}{1} = \frac{8766}{24} = 365\frac{1}{4}$, ſo that the year is a civil, not a ſolar year, which a true repreſentation requires. The wheel of 24 teeth, connected with the earth's axis, drives that of 18, on the arbor of which is a ſingle endleſs ſcrew acting with the large wheel of 487, which wheel is $17\frac{3}{4}$ inches diameter, and fixed faſt, ſo as to reſiſt the power of the ſcrew, which is therefore itſelf obliged to move, and the annual frame along with it, the ſpace of $\frac{1}{487}$ of a circle in every 18 hours, or time of a revolution of the ſpiral thread. The ſhape of the teeth of this large wheel is that of a common ſaw, and it has evidently been divided and cut without an engine, for the dividing marks are ſtill viſible. The parallelism of the earth's axis is preſerved by means of five wheels, of each 60 teeth, the firſt of which is fixed on the central arbor of the large wheel of 487, and the others are carried by the annual frame, ſo that they revolve each in a civil year, except the fixed one, which is the cauſe of motion to all the reſt; the ſecond and fourth wheels revolve in a forward, and the third and fifth in a backward direction; conſequently the parallelism is perfect, but might have been effected with fewer wheels.

The wheelwork for the moon's period is $\frac{35}{12} \times \frac{75}{49} \times \frac{153}{25}$ of a day, the value of which train is $27^{d}\ 7^{h}\ 42^{m}\ 51.^{s}42$, and the error in exceſs is $13.^{s}26$. This period, it will be obſerved, is a periodic, not a ſynodic revolution, and it required ſome obſervation, as well as ſkill in planetary calculations, to aſcertain firſt how the ſynodic revolution, or lunation, is effected by wheelwork, that anſwers to a periodic revolution, and ſecondly, the preciſe length of that ſynodic revolution: in the firſt place, the periodic is converted into a ſynodic revolution thus; ſome of the wheels of the moon's train are placed upon the wheel that preſerves the earth's parallelism, which wheel, we have ſaid, has a backward motion once in a civil year; it conſequently carries its load of wheels round the earth once in a year, in a retrograde direction: but the laſt wheel of the train, which has 153 teeth, is a ring indented on the interior circle, and moves concentric with the earth, in a period that would be $27^{d}\ 7^{h}\ 42^{m}\ 51.^{s}42$, if it experienced no drawback in each revolution: but the pinion of 25, which actuates this wheel of 153, is annually carried backwards by the wheel of parallelism, while its teeth are in action, and therefore the wheel of 153 has its periodic motion, ariſing from the train ſimply conſidered, retarded by one

one entire revolution in a year; or, in other words, by the drawback in queſtion, one entire revolution of the moon, as ſhe regards the earth, is ſubtracted in every year, which ſubtraction, being effected gradually, makes every lunation longer than it otherwiſe would have been, by leſſening the whole number of revolutions: let us ſee, ſecondly, if this tranſmutation of the periodic into a ſynodic revolution be performed with requiſite accuracy; $27^d\ 7^h\ 42^m\ 51.^s42$ are equal to $27.^d321428$, by which, if we divide 365.25, the period of the earth's revolution, the quotient 13.368628 will expreſs the number of periodic revolutions, as effected by the train of wheelwork excluſively: then if we deduct unity, the effect of one retrograde revolution in a year, produced by the wheel of parallelifm, we ſhall have 12.368628 for the number of lunations in the ſame time, by which, if we again divide 365.25, we ſhall have 29.53035 nearly, or $29^d\ 12^h\ 43^m\ 42.^s7$ for the time elapſed between two ſucceſſive conjunctions of the moon, which lunation is quicker than a true one, as taken from the aſtronomical tables, by $20.^s1$.

The wheels for the motion of the moon's nodes plate, are $\frac{26}{98} \times \frac{93}{26} = \frac{93}{98}$, the retrograde period of which is $\frac{93}{5} = 18\frac{3}{5}$ years, or $6793^d\ 15^h\ 36^m$ (ſee NUMBERS *Planetary*), which period is too ſhort by $4^d\ 13^h\ 17^m$ nearly, or a ſpace in the ecliptic of $14'\ 28\frac{1}{4}''$, correſponding to this time. This error, in ſo ſlow a motion, is not indeed very conſiderable, as it is $18\frac{3}{5}$ years in amounting to leſs than a quarter of a degree. The wheel of 98 is made faſt to the annual wheel of parallelifm, and, by means of a pair of intermediate wheels of 26 teeth each, pinned together on the ſame arbor, communicates its motion to the wheel 93, which revolves once in a year, and $\frac{5}{93}$, or five teeth more, which exceſs above one revolution, in a retrograde direction, as it regards the moon's motion in her orbit, amounts to an entire backward revolution in the period already ſpecified, which is therefore the time of retrogradation of the nodes of the lunar orbit. An inclined circular rim is carried by the wheel 93, as the repreſentative of the moon's orbit, and the ſtem of the moon reſting on its plane, riſes and falls alternately, as the moon performs her ſynodic period, and indicates the latitude engraved on the face of the rim in queſtion, which contrivance has been ever ſince adopted by the Engliſh inſtrument-makers. The wheelwork for making the moon keep her illuminated phaſe towards the ſun in all parts of her orbit, by means of a little black ſemiglobular cap, is $\frac{20}{86} \times \frac{28}{6} = \frac{560}{516}$, which at firſt view appeared to be very erroneous, ſeeing the cap ought to revolve juſt once in each lunation; but a little examination ſoon convinced us that an allowance is here alſo to be made for a tranſpoſition of ſome of the wheels in each month; the wheel of 86, or firſt wheel of the train, is made faſt to the annual wheel of parallelifm, and the reſt of the wheels are borne by the lunar ring of 153 teeth, before deſcribed, which it has been ſeen revolves in a forward direction, once in each lunation; when the train is reduced to the ſimple form $\frac{560}{516}$, the 560 repreſents the lunar wheel 28, and the 516 the wheel of 86 on the annual bar, and to aſcertain how much the former is accelerated by the backward tranſpoſition of the latter, we muſt ſay as $365\frac{1}{4}^d : 516 :: 29.^d53035 : 42$ nearly, ſo that in each month the product (which may be called the wheel) 560 is accelerated, as much as if 516 had been $516 + 42 = 558$, and the whole value of the train $\frac{560}{558}$ without tranſpoſition: but to make the parallelifm complete, the products of the drivers and of the driven wheels ought to have been alike, which they are not by $\frac{2}{560}$; the deviation from perfect accuracy is, however, of leſs moment than it would have been in one of the planetary periods, becauſe the cap is eaſily adjuſtable whenever the error becomes ſenſible.

After this examination and report of Graham's portion of the orrery, which is the moſt eſſential part, it will appear remarkable to the reader, that the inventor ſhould have gained as much credit from his expenſive and cumberſome conſtruction of a machine, in which neither accuracy nor ſimplicity has been attained, as if he had contrived a perfect repreſentation of the earth's and moon's motions in the ſimpleſt and moſt accurate manner; but the fact ſeems to have been, that the complexity of the conſtruction has hitherto ſo puzzled every examiner of its internal mechaniſm, that all attempts to aſcertain the periods correſponding to the wheelwork employed therein have proved ineffectual, until we undertook to diſcloſe the value of each train by ſyſtematic rules, that we truſt are intelligible by ordinary readers; and we beg to avow our diſintereſted love of truth, by aſſerting that, ſo far as we have examined this machine, it "has paſſed for more than it is worth."

*Rowley's Portion.*—The inſtrument-maker whom Dr. Deſaguliers mentions as having added portions of his own to Graham's orrery, to render it more comprehenſive, was, as we have ſaid, Rowley, whoſe name is familiar among the inſtrument-makers of the preſent day: the portion which probably was firſt attached, as an appendage to Graham's, was the mechaniſm for effecting the ſun's rotation, and the revolutions of the inferior planets, Mercury and Venus, to complete the ſyſtem as far as to the earth's orbit inclufively; accordingly theſe are the parts of the orrery before us which remain to be deſcribed; but before we enter upon the examination and deſcription, it may prepare the reader for what he has to expect, to premiſe, that the artiſt with whom we have now to do, has not profited much in point of ſimplicity from a contemplation of his predeceſſor's complexity of mechaniſm; they neither of them have borne in mind the uſeful maxim, that "more means are not neceſſary than are ſufficient to produce an end;" but it may be alleged as an excuſe for our preſent artiſt, that it is eaſier to deviſe and make a new inſtrument with all its dependent parts as a whole, than to adopt the ideas and calculations of another artiſt, and make them, imperfect as they may be, the baſis of further calculations for additional movements, that did not enter into the original deſign; which is the difficulty under which Rowley muſt have laboured, when he undertook to introduce into Graham's machinery the wheelwork for the ſun and inferior planets.

We will begin with the movement of the ſun, which is $\frac{94}{1} \times \frac{12}{60} \times \frac{26}{26} \times \frac{24}{24} \times \frac{60}{36}$, but we may omit the portion $\frac{26}{26} \times \frac{24}{24}$, as being of no value in the calculation, and ſerving only to tranſfer the motion communicated to them; then the remaining or effective portion of the wheelwork will be $\frac{94}{1} \times \frac{12}{60} \times \frac{60}{36}$, or $\frac{94}{1} \times \frac{12}{36} = 31\frac{1}{3}$, which are ſo many days by reaſon of the ſingle ſcrew denoted by unity revolving in a day, and this would have been the exact period of a rotation

a rotation produced by the mechaniſm, if the wheels had been all in a permanent ſituation; but becauſe many of them are carried by the earth's annual bar round the ſun, whilſt their connection with the laſt moving or central wheel of 60 is preſerved, an additional motion is thus produced in it, independently of the proper motion depending on the preceding calculation, which additional motion or *acceleration* may be thus eſtimated; the wheel of 94 revolves once in every year by means of its poſition on the annual bar, and alſo that of 60, which is contemporary by being placed on the ſame common arbor; but the pinion of 12 is actuated by this laſt wheel $\frac{60}{12}$, or five times round in a year, as is alſo its contemporary wheel of 36, which again drives the laſt wheel of 60; hence $5 \times 36 = 180$ teeth of the laſt wheel are brought into action by theſe means in every year; but the laſt wheel has got only 60 teeth, therefore $\frac{180}{60} = 3$ are ſo many entire rotations *per annum* produced by the *manner* in which the mechaniſm is placed, beſides the 11.625, or $\frac{365.25}{31.33}$ rotations occaſioned by the proper action of the train; the whole number of rotations, therefore, are $11.625 + 3 = 14.625$, by which, if we divide 365.25 days, we ſhall obtain $24^d\ 23^h\ 23^m\ 4.^s6$ for the whole period of the ſun's rotation, as produced by the conjoint operations of the train and annual bar.

In the ſame way muſt the whole periods of the two inferior planets be aſcertained; for the long train which actuates the ſun's rotation is common to both theſe until we arrive at the laſt pair of each: the movement of Mercury, if we put down again all the wheels concerned in producing the motion of this planet, will ſtand thus, $\frac{94}{1} \times \frac{12}{60} \times \frac{26}{26} \times \frac{24}{24} \times \frac{88}{15}$, the effective portion of which is $\frac{94}{1} \times \frac{12}{60} \times \frac{88}{15} = 110.293$ days for the period produced in the regular way: the acceleration here, eſtimated in the ſame way as that of the ſun was, is $5 \times 15$, or 75 teeth in the laſt wheel, or wheel of 88; conſequently $\frac{75}{88} = .8522727$ of a revolution conſtitutes the *acceleration* in this caſe, which added to 3.3116234 $\left(\text{or } \frac{365.25}{110.293}\right)$ revolutions produced by the regular action of the train, amounts to 4.1638961 revolutions *per annum*; and $\frac{365.25}{4.1638961} = 87^d\ 14^h\ 47^m\ 24.^s9$ is the whole period ariſing out of the compound motion.

Again, the other planet Venus has for a whole train $\frac{94}{1} \times \frac{12}{60} \times \frac{26}{26} \times \frac{24}{24} \times \frac{225}{15}$, or in effect $\frac{94}{1} \times \frac{12}{60} \times \frac{225}{15} = 282$ days without the acceleration, which in this inſtance is $\frac{75}{225}$, or $\frac{1}{3}$d of a revolution; we have then $\frac{365.25}{282} = 1.295212$ revolutions without the acceleration or quantity .333333, which together make 1.628545 revolutions *per annum*, or one revolution in $\frac{365.^d25}{1.628545}$, or in $224^d\ 6^h\ 36^m\ 59.^s72$ from the joint effect of both cauſes of motion.

We are not quite certain whether or not the reader will fully comprehend the nature of the acceleration here deſcribed, from any verbal deſcription that could be given; but the artiſt who may have opportunity to notice the wheels in motion, will have no difficulty, after peruſing this account, in completely underſtanding the ſeparate ſources of motion, however he might have been previouſly perplexed to aſſign to each its due quantum of the joint effect.

And now that we have arrived at the reſult of our examination, it appears by a compariſon of theſe periods with the exact times of the reſpective revolutions, collected from the aſtronomical tables, that they are by no means ſo accurate as might have been expected from ſuch elaborate calculations, and ſuch complex mechaniſm.

Beſides theſe portions of mechaniſm, there are ſome wheels connected with the ſun's axis, which carry round a ſupport for a little lamp, to be kept always ſix ſigns from, or oppoſite to the earth, and to illuminate one of its hemiſpheres, when a three inch globe is put on as the earth's repreſentative, which is an occaſional apparatus; the uſual globe being $1\frac{1}{4}$ inch ball of ivory; the movement, to anſwer this purpoſe, is $\frac{12}{60} \times \frac{73}{1}$ of the ſun's rotation, *viz.* $\frac{876}{60}$ of 24.97435 $= 364^d\ 15^h\ 0^m\ 44^s$, which deviates from what it ought to be, about 15 hours motion in a year; but this deviation is of little conſequence, as the intention of the lamp is only to illuminate the earth, while the viciſſitudes of day and night, and the ſucceſſion of the ſeaſons, &c. are under conſideration. The lamp has a convex lens placed, we preſume, at the diſtance of its focal convergence from the light, ſo that the rays which paſs through may proceed parallel to each other to the little globe.

The laſt wheels, or rather rings of Mercury and Venus, have their planes inclined, ſo that the ſtems which bear the planetary balls, being ſcrewed into them, riſe and fall reſpectively, as the rings revolve by means of friction-rollers, for the purpoſe of ſhewing the variations of latitude; they are alſo placed a little excentrically with reſpect to the ſun. The perihelion diſtance of Mercury is $2\frac{1}{4}$, and the aphelion diſtance $2\frac{9}{10}$ inches by meaſurement, which ſhould have been very nearly to each other as 4 to 6: Venus is at the mean diſtance $5\frac{1}{2}$, and the Earth $9\frac{1}{4}$. As it has been before obſerved, there is no graduated circle for indicating the day of the month, ſo that this inſtrument, we muſt conclude, was never intended to point out the *particular day* on which any phenomenon is exhibited, but merely to give a general repreſentation of celeſtial appearances; which purpoſe, notwithſtanding its inaccuracies, it is calculated to do in a pleaſing manner by the aid of its external appearance. We cannot diſmiſs the conſideration of this machine, without remarking further one peculiarity which ſtruck us on firſt counting the teeth of the two laſt wheels in each of Rowley's movements; which for Mercury are $\frac{88}{15}$, for Venus $\frac{225}{15}$, and for the Sun $\frac{60}{36} = \frac{25}{15}$. It occurred to us at the time of examination, that the laſt movers were intended to repreſent exact days; the periods being to each other in the neareſt whole numbers, as 25, 88, and 225 reſpectively; and we are ſtill of opinion that the artiſt intended they ſhould be ſo during his labours; for it is much more probable that theſe numbers were *firſt fixed upon*, and afterwards connected with the diurnal motion

by intermediate wheels to anſwer this purpoſe in the beſt way that could be deviſed, than that ſuch complex data, as a compound motion affords, ſhould be fixed upon for the ground-work of the calculations: indeed it is improbable in the extreme that *all* the laſt wheels, ſo circumſtanced, ſhould have been obtained by any regular arithmetical proceſs, other than voluntary aſſumption of theſe numbers, with a determination to make them anſwer by ſubſidiary additions; which circumſtance accounts pretty well for the great number of wheels introduced which form no part of the calculation, and at the ſame time renders it exceedingly probable that the inventor himſelf, not attending ſufficiently to the *compoſition* of the motions, believed that the periods were reſpectively 25, 88, and 225 days, and the probability gains additional ſtrength, from the conſideration that, ſuppoſing the ſun's rotation to be performed in exactly 25 days, the mechaniſm for carrying round the lamp, *viz.* $\frac{12}{60} \times \frac{73}{1}$ of 25 would in that caſe give a revolution in exactly 365 days; which, therefore, moſt likely, was the period intended; indeed ſuch a concurrence of four whole periods without a fraction, under ſuch a complexity of circumſtances, puts the matter almoſt beyond a doubt.

*Rowley's grand Orrery, made by Wright.*—In the month of July, 1813, we were favoured with a peep into the interior conſtruction of the ſuperb orrery at Richmond obſervatory, made by T. Wright, mathematical inſtrument-maker to his majeſty George II. in the year 1733; it was our intention to have analyſed the wheelwork, ſo as to have taken a particular account of each train, but when the covering parts were taken off, we found that the time allowed us for ſuch labour was inadequate, even if we had been admitted to take the conſtituent portions into detached pieces for examination. The mechaniſm for the Sun, Mercury, and Venus, appeared to be ſimilar to what we have already deſcribed, and could not be minutely inſpected in an attached ſtate, as ſeveral of the wheels were concealed by cocks and other parts that were not allowed to be undone. It was of importance, however, to aſcertain the diurnal and annual wheels of the earth as accurately as we could, ſince the other periods take the earth's motion as the ſtandard of their time. At the firſt peep into the interior of the machine, not only an unexpected multiplicity of wheels preſented themſelves to the eye, but many of them were ſo enormouſly large, that we at firſt deſpaired of being able to count any of their teeth in a ſatisfactory manner; but having with us a pair of ſpring-dividers, we adopted the plan of taking in twenty teeth at once between their points, which ſcheme conſiderably leſſened our labour, and enabled us to bring away with us ſeveral of the numbers. Beyond the orbit of Venus there are nine large concentric rings indented, revolving round rollers placed on ſtuds on the bottom of the machine, and regularly increaſing in diameter till the ninth, or laſt, which is a fixed one, nearly filling the ſpace within the ſurrounding ecliptic, which within is 42 inches in diameter. The handle enters the ſide of the ornamented caſe, and takes hold of an horizontal arbor which lies acroſs theſe rings, but beneath them, having three different contrate wheels faſt to it in ſight, and being connected with ſeveral pinions, in a way not ſeen; ſome of which are ſupported under the bottom plate by a ſliding bar, that brings them into or out of action, with their large rings reſpectively; the contrate wheels alſo will ſlide into or out of action ſeparately. If we begin to count from the largeſt, or fixed rim, calling it one, the ſliding pinions drive the moveable rings thus; a pinion of 9, appearing to revolve, by means of the concealed mechaniſm, in 172 days, or turns of the handle, actuated, when forced home into action, the third ring of 560 teeth; the period correſponding to which numbers is $\frac{560}{9}$ of 172 days = 10702.2. This period we can hardly ſuppoſe to be the exact one intended by the maker of the machine; but if the pinion of 9 be made to revolve 172.8 days, which is equally practicable, then the period thus rectified will be 10746.8 days, nearly as in nature: this ring carries the ball of Saturn, on a ſtem connected with it, at the diſtance of 17.5 inches from the ſun. Again, a pinion of 8, on the concealed ſliding bar, drives the fifth ring of 480 teeth in apparently 72 days; but the correſponding period $\frac{480}{8}$ of 72 = 4320, is too little by 10.6 days: we muſt, therefore, ſuppoſe that the pinion of 8 revolves in $72\frac{1}{4\frac{1}{5}}$ days, and then the rectified period will be 4330.6 days for Jupiter, whoſe ſtem is 12.9 inches from the ſun. For Mars, the ſeventh ring, with 365 teeth, is driven by a pinion of 10 in $\frac{365}{10}$ of 19 days apparently, or in 693.5 days, the planet being at $10\frac{1}{4}$ inches from the ſun; but this is too inaccurate alſo, therefore ſubſtitute 18.82 days for the period of the pinion, and the rectified period will be $\frac{365}{10}$ of 18.82, or 686.93 days, pretty nearly the truth. Thus have we been able to aſcertain the values of the concealed wheels, which may be repreſented very eaſily by wheels of common numbers, deriving their motions firſt from the horizontal diurnal arbor, and then from one another, from the quickeſt to the ſloweſt movers in ſucceſſion. The eighth ring, which is driven by a pinion of 20, always in action, has alſo 365 teeth, and the time in which the pinion revolves was aſcertained to be 20 days, ſo that each tooth of the wheel repreſents an exact revolution of the handle, and alſo, as we ſhall ſoon ſee, a ſolar day: on this wheel the annual arm is ſupported, and likewiſe the mechaniſm for the revolutions of the Sun, Mercury, and Venus, as before deſcribed, but their periods will not be exactly the ſame, becauſe here the year conſiſts of only 365 days; whereas in the ſmaller inſtrument it had $365\frac{1}{4}$ as the ſtandard period. We will return to the diurnal motion, when we have deſcribed the remaining indented rings: the firſt, which we have ſaid is fixed faſt, is uſed for preſerving the parallelism of Saturn's ring, for doing which ſeveral wheels and an endleſs ſcrew are introduced; but as it was only to produce a fraction of high numbers, where the numerator and denominator are neceſſarily alike, we thought it of no importance to count thoſe numbers. The ſecond ring revolves by the action of the firſt contrate wheel on the horizontal diurnal arbor, which has thirty teeth; but as the wheels for producing the periods of the five ſatellites of Saturn (the two neareſt not being then diſcovered), are numerous, and the planes of the orbits improperly placed horizontal, we thought it adviſable to loſe no valuable time in examining them, particularly as no phenomena of importance are illuſtrated thereby; we, therefore, proceeded to Jupiter's ſatellites, which are of more importance in any machine. The fourth ring, from which theſe take their motions, has 540 teeth, driven by the ſecond contrate wheel of 36 placed on the diurnal arbor: again, this ring gives its motion unaltered to a pinion of 21 borne by Jupiter's arm, which pinion, therefore, has a combination of two

motions, one derived from the diurnal arbor, the value of which is $\frac{21}{36}$ of a day, and the other $\frac{540}{21}$ in Jupiter's whole period, in conſequence of the 21 being carried round 540 in that ſpace of time. This portion of the motion is a deduction by reaſon of the pinion receiving a *retrograde* motion from the handle, or cauſe of the quicker motion, but a *direct* motion from Jupiter's ſlow motion in the orbit, and the *difference* of theſe two is the abſolute motion of the pinion before us to be aſcertained: but before we aſcertain this difference, let us ſee what the period would be of the arbor that carries the four drivers of the ſatellites, without conſidering the deduction in queſtion; for in all probability this deduction was not in the mind of the contriver when the numbers were calculated: $\frac{21}{36}$ of a day is juſt 14 hours, for the period of the pinion of 21, on a ſuppoſition of its being in a ſtationary ſituation, and the wheels that tranſmit the motion along Jupiter's arm are in effect $\frac{48}{28}$ or $\frac{12}{7}$, and $\frac{12}{7}$ of 14 hours is 24, or an exact day: on the arbor of the laſt wheel of 48 are placed four drivers to actuate each its fellow in its own period: the pairs are thoſe with the values placed oppoſite them; *viz.*

| | | D. | H. | M. |
|---|---|---|---|---|
| 1. Satellite | $\frac{84}{48}$ of $24^h$ - - | 1 | 18 | 0 |
| 2. Ditto | $\frac{85}{24}$ of 24 - - | 3 | 18 | 0 |
| 3. Ditto | $\frac{86}{12}$ of 24 - - | 7 | 4 | 0 |
| 4. Ditto | $\frac{100}{6}$ of 24 - - | 16 | 16 | 0 |

As all the numbers, that we have here examined, have correſponding values in time, without a remainder, and as the time of the firſt mover comes out an exact day, it may be conſidered as certain, that theſe were the reſults calculated upon by the contriver, who, in every inſtance throughout the machine, has neglected the conſideration of minutes and ſeconds in his calculations of the periods. But we propoſed to aſcertain the real periods, when the allowance is made for the drawback occaſioned by the motion of Jupiter's arm, which is thus calculated: $\frac{540}{21} = 25.714285$ &c. is the number of revolutions in a forward direction, made by the pinion 21, in Jupiter's period of 4330.6 days, as before determined; then one of theſe revolutions being performed in 14 hours, as we have ſeen, we ſhall have $25.714285 \times 14 = 359.99999$, &c. or 360 hours for the deduction in the aggregate reduced to hours: therefore, as $4330.^d6 : 360^h :: 14^h : 2.^m90673$; that is, if Jupiter's period produce a drawback of 360 hours, one rotation of 14 hours will have a drawback of 2.90673 minutes, which, taken from 14 hours, leaves 13.951555 hours as the corrected period of the pinion of 21 to revolve in, inſtead of 14 hours, which would have been the period if Jupiter had not had a revolution in his orbit. We have now, therefore, the ſubjoined periods from the ſame wheelwork, which are really fractions, not of 24 hours, but of $\frac{48}{28}$ of $13.^h951555$, which comes out $23.^h916951$, or $23^h\ 55^m\ 1^s$. Hence we have,

| | | D. | H. | M. | S. |
|---|---|---|---|---|---|
| 1. Satellite | $\frac{84}{48}$ of $23.^h916951$ - | 1 | 17 | 51 | 16 |
| 2. Ditto | $\frac{85}{24}$ of ditto - | 3 | 12 | 42 | 21 |
| 3. Ditto | $\frac{86}{12}$ of ditto - - | 7 | 3 | 24 | 17 |
| 4. Ditto | $\frac{100}{6}$ of ditto - | 16 | 14 | 36 | 57 |

Theſe periods are not ſo accurate as thoſe which we gave before, nor is either of the ſets ſo accurate as might have been expected in a machine of the value of 1500*l.*, which, we were informed by an inſtrument-maker, who was preſent, muſt have been about the original price. The ſixth ring, which has 432 teeth, is impelled by the third contrate wheel on the horizontal diurnal arbor of 46 teeth; and a wheel, or rather pinion of 23, receives the motion through the medium of the ring 432, as was the caſe with Jupiter's 540; and a ſimilar allowance for the drawback is to be made here for the time of revolution of the pinion 23, as was there for the pinion of 21. The period $\frac{23}{46}$ of a day is 12 hours, which would have been the period of the revolution of pinion 23, provided the arm of Mars had not been carried in its revolution round the wheel 432, in his period. But we muſt aſcertain the correct period by calculation, as we did the 21 of Jupiter, thus: $\frac{432}{23} = 18.78260$ are the revolutions to be deducted of each 12 hours, or, which is the ſame thing, 9.3913 days' motion in the time of the period of Mars, which we have taken at 686.93 days. Hence, as $686.^d93 : 9.^d3913 :: 12^h : 0.^h15405$; and the third term, diminiſhed by the ſecond, leaves 11.83595 days as the correct period for the time of a revolution of pinion 23; then, $\frac{24}{50}$ of this time is $24^h\ 39^m\ 29^s$ for the revolution of Mars, which, without the correction, would have been 25 hours exactly, furniſhing another proof of the author's intention.

For want of ſufficient time, we omitted to notice particularly whether or not the planets, Saturn and Jupiter, had their motions round their axes produced by wheelwork, like Mars; but the impreſſion on our mind is, that they had, though we could not take down the numbers at the time.

We return now to the earth's motion, as we propoſed. We have already ſaid, that the large wheel, which revolves in a year, has 365 teeth, and that each tooth repreſents a day. The ninth, and laſt ring that he have to mention, is within this annular ring, and has the ſame number of teeth, namely 365: its uſe is to take a tooth from the contrate wheel of 96, on the diurnal arbor, (or otherwiſe moving contemporary with it,) and to give it to a wheel on the earth's axis, or rather to a wheel on a tube that aſcends to the earth's axis, and that communicates this motion to the axis by the medium of three equal pinions. It was difficult to obtain the number of teeth of the tubed wheel, which at firſt we ſuſpected was 96 alſo; in which caſe, there would have been an error in the diurnal train of $\frac{365}{96}$, or $3\frac{77}{96}$ days

in

in a year, ſimilar to the drawback we have noticed in the caſe of Jupiter's moons, and the rotation of Mars; becauſe while the firſt 96 is ſtationary, and the ſecond moveable, by being put on the annual bar, it is clear that this laſt has a compound motion, compoſed of + 365 from the handle, and $-3\frac{7}{95}$ ariſing from the annual circuit round the ninth ring of 365. To ſatisfy ourſelves as to the reſult of this combination, we turned the handle 365 times, and counted juſt 365 rotations of the earth in the ſame time; which correſpondence convinced us, that there muſt exiſt a compenſation that does not appear at firſt ſight; and it was not till we had returned home, that the means neceſſary for effecting this compenſation occurred to us, but which we are fully ſatisfied are the means adopted. The deduction, we have ſeen, is $3\frac{7}{95}$ revolutions of the wheel on the annual bar, in each 365 days: now $3 \times 96 + 77 = 365$; therefore, this deduction is at the rate of one tooth *per* day: and to balance this deduction of one tooth *per* day, there muſt ſomehow be, by way of balance, an acceleration or addition of one tooth *per* day, which is done ſimply thus: let the tubed wheel, on the earth's annual bar, be 95 inſtead of 96, while the wheel in the fixed ſituation remains as we counted it 96, and the conſequence will be this; the *deduction* will now be $\frac{365}{95}$ $= 3\frac{80}{95}$ revolutions of the earth's axis, by the effect of the annual motion on this wheel of 95, and $3 \times 95 + 80 = 365$, as before; but for every turn of wheel 96, on the diurnal handle, wheel 95 makes an entire rotation, and *one tooth more*, or receives an *addition* of one tooth *per* day, from the diurnal motion only: hence from the diurnal motion ariſes an acceleration of one tooth *per* day in the earth's rotation; but from the annual motion ariſes a retardation of one tooth *per* day, which would not have been the caſe, if the ninth ring, for the tranſmiſſion, had not had as many teeth as days. The balance, therefore, is exact; and it now appears why the wheel for the tranſmiſſion of motion from the 96 to the 95 was made with 365 teeth, in preference to any other number. Nay, if the year had conſiſted of $365\frac{1}{4}$ days, the compenſation would not have been perfect, as we preſume it now is, in conſequence of the numbers we have every reaſon to conclude are adopted, except that we have not actually counted the wheel 95, concealed under the moon's mechaniſm, which we were not authoriſed to diſplace. By this compenſation, the diurnal handle and the earth's axis make each 365 rotations in the year, and the only error remaining would be a quarter of a degree nearly, in each year, in the ecliptic circle, which probably on this account has no annual index, nor any days of the month inſerted. Thus the more minutely we examine the diſtinct portions of this mechaniſm, the more clearly we ſee the reaſons, not only of various contrivances, and of many of the numbers adopted in this particular conſtruction, but alſo of the omiſſions of parts generally deemed neceſſary in more recent conſtructions. The omiſſion of a quarter of a day in the year, and alſo of the daily hand and ecliptic index, is an omiſſion ariſing entirely out of the manner in which the motion of the handle is tranſmitted to the earth's axis, as is alſo the want of a ſidereal horary plate; that of the ſun being made faſt to the cover, ſupported by the annual bar, and the horary index being put on a vertical diurnal arbor at ſome diſtance from the earth, which is an ivory ball of about an inch and half diameter, neatly engraved, with the principal lines and countries on its ſurface, and fitted up with a circle of illumination, and placed at the diſtance of $6\frac{3}{4}$ inches from the ſun; while the diſtances of Venus and Mercury are at $3\frac{1}{4}$ and 2.2 reſpectively. We come, laſtly, to the moon, which performs her lunation in $\frac{96}{24} \times \frac{118}{16}$ of a day, which period is $29^d\ 12^h$; and the inclined plate for the moon's latitude is carried backward, for the motion of the nodes by the wheels $\frac{95}{100}$ in $\frac{95}{5}$, or 19 civil years. The wheels $\frac{93}{98}$, however, which are equally convenient, would have produced a much more accurate reſult in $18\frac{3}{5}$ years. A cap of parallelism moved round in each lunation, by three equal ſmall wheels on the lunar arm, the interior one being faſt to a fixed tube, as we ſuppoſe, exhibits the phaſes for each day of the moon's age, which are indicated alſo on the cover, at ſome little diſtance from the horary circle. Above the ecliptic circle are erected a braſs ſemicircle for half the equator, the ſolſtitial colures, the ſummer tropic, and arctic circle, with the polar point; which appendages add to the appearance of the machine; and the works are admirably preſerved by a caſe, with glaſs both above and round the body of the machine, which is ſuperbly ornamented with chaſed work, in many figures reſembling the fore-part of a horſe, between each animal of the ecliptic ſigns; and our only ſurpriſe is, that ſo much money is expended with ſo little real effect. At each ſide of the handle is a braſs knob: when the right-hand one is drawn out, the ſecondaries of Jupiter and Saturn, as well as the rotation of Mars, ceaſe to move; and when the left-hand one is drawn in like manner, the ſuperior planets themſelves ſtop; but the earth and moon, with the inferior planets, move with the handle under all circumſtances.

The reader of this account may have remarked, that the numbers uſed in the *grand orrery*, (as it has been very properly called, if we ſurvey the exterior of it only,) has the numbers of the teeth in its wheels all *compoſite*, or ſuch as are diviſible by hand; and it is ſaid that the wheels were all divided and cut, before an engine was uſed in England, which is the manifeſt reaſon why great accuracy in theſe numbers was not attempted: for prime numbers would have produced thoſe difficulties in the execution, which the uſe of a perfect engine has now entirely removed.

*Ferguſon's Orrery.*—James Ferguſon invented various inſtruments from time to time for illuſtrating the phenomena of the ſolar ſyſtem, and his works are in every one's hands, which contain the drawings and deſcription of them; but that which is known by the name of Ferguſon's Orrery is the moſt accurate, and merits our notice in this place; it comprehends the motions of the Sun, Mercury, Venus, Earth, and Moon, and is particularly deſcribed both in the author's "Select Mechanical Exerciſes," and in his "Tables and Tracts," to which the reader is referred for the plates and deſcription of the mechaniſm, which is rendered ſufficiently intelligible. On examining the numbers of which the wheels have their teeth compoſed, we found that the author has attributed to them greater accuracy than they really poſſeſs, for which reaſon we ſhall ſubjoin the wheelwork, together with the value of each train, as well as the periods attributed to the machine by Ferguſon; from a compariſon of which it will appear how neceſſary it is to eſtimate the value of any train of wheelwork in expenſive machines by actual calculation, rather than take on credit the periods attributed to them by their author. It will be ſufficient for our preſent purpoſe to give the numbers of the wheels and pinions of each train, with the correſponding periods, in a table.



TABLE

TABLE of Ferguſon's Trains, with their correſponding Periods in Time.

| Motions. | Wheelwork. | Periods. |
|---|---|---|
| | | D. H. M. S. |
| Earth's diurnal motion - | $\frac{25}{8} \times \frac{69}{7} \times \frac{83}{7}$ | 365 5 48 58.78 |
| A lunation - | $\frac{30}{64} \times \frac{63}{1}$ | 29 12 45 0 |
| Sun's rotation - | $\frac{25}{8} \times \frac{69}{7} \times \frac{64}{78}$ | 25 6 35 36 |
| Revol. of Venus | $\frac{25}{8} \times \frac{69}{7} \times \frac{73}{10}$ | 224 20 47 8 |
| Rev. of Mercury | $\frac{18}{28}$ of Venus + 1 | 87 23 47 24 |
| Rot. of Venus - | $\frac{8}{74}$ of its revol. | 24 22 31 8 |
| Moon's node - | $\frac{56}{59}$ | $18\frac{2}{5}$ years. |
| Earth's parallelifm | $\frac{40}{40} \times \frac{40}{40}$ | 1 revolution. |

Beſides theſe wheels and pinions there are others for ſubſidiary purpoſes, which do not enter into the calculations of the periods, and are therefore omitted in this brief account, which is intended only as an appendage to Ferguſon's own deſcription. The periods attributed by the author are as follow; *viz.*

| | D. | H. | M. | S. |
|---|---|---|---|---|
| Earth's diurnal motion - - | 365 | 5 | 48 | 57 |
| A lunation - - - | 29 | 12 | 45 | 0 |
| Sun's rotation - - - | 25 | 6 | 0 | 0 |
| Revolution of Venus - - | 224 | 17 | 0 | 0 |
| Ditto of Mercury - - - | 87 | 23 | 0 | 0 |
| Rotation of Venus - - | 24 | 8 | 0 | 0 |

It may be ſaid in favour of this ſtatement, that the deſcription is a popular one, and therefore ſufficiently accurate for ordinary readers; but when the author undertakes to appreciate the errors of his wheelwork, which he has done, a more correct report of the periods is indiſpenſable. The rotation of Venus, according to Bianchini's determination, which Ferguſon has here adopted, is no longer conſidered as the proper rotation. There is conſiderable ingenuity ſhewn in the contrivance for making the rotations of the handle agree with thoſe of the earth.

*Mr. Benjamin Martin's Orrery, or Microcoſm.*—In the ſecond volume of Benjamin Martin's "Mathematical Inſtitutions" (p. 479, et ſeq.) we meet with a detailed account of ſome aſtronomical mechaniſm which he propoſed to be attached to a clock, about the year 1764, under the name "Microcoſm," or little world; but we do not find that the plan was ever put into execution. It was not intended to be the regular repreſentative of all the ſolar ſyſtem, with the motions in their due places, but ſuch a repreſentation only as would exhibit the planetarium portion in one place of the clock, the tellurian in another, and the lunarium in a third; and, as it ſhould ſeem, a Jovian lunarium was intended to be occaſionally ſubſtituted for the planetarium, to go by the motion of the clock. The author, however, after having propoſed his plan, ſeems to have deſpaired of having any order given to make ſuch a piece of mechaniſm, chiefly from a conſideration, which is equally true in our own time; *viz.* that "by *arts* and *artiſts* we underſtand only *engraving*, *painting*, and *ſculpture*, and thoſe who practiſe them;" ſcientific mechaniſm being not uſually comprehended under thoſe terms, as being but little cultivated; and the more faſhionable ſtudies of chemiſtry and galvaniſm, we may add, at preſent engroſs the principal attention of the philoſophical world. But though the microcoſm was, perhaps, never conſtructed as an appendage to a clock, yet it laid the foundation of our more modern planetaria, tellurians, and lunaria, which conſtitute the orrery in three parts, as conſtructed by the workmen of Meſſrs. Adams, Jones, &c.; on which account we ſhall deſcribe the different portions ſeparately, and ſuggeſt ſuch obſervations to the reader as may enable him to appreciate their accuracy. For a deſcription of the planetarium portion, the reader, however, is requeſted to turn to the article PLANETARIUM, where our plan of arrangement has placed it as a ſeparate inſtrument.

*The Tellurian Portion.*—Tellurian is a word which owes its origin, we believe, to B. Martin, and which implies a detached portion of mechaniſm, calculated to repreſent the annual and diurnal motions of our earth (tellus) only, and as ſuch, was at firſt, as it ſtill continues to be, an appendage to the planetarium, and forming with it and the lunarium the common orrery: the principal requiſites for this inſtrument, or rather portion of an inſtrument, are a train of wheels for preſerving the conſtant parallelifm of the earth's axis, on which, together with its proper inclination, depends the change of ſeaſons, and another train compoſed of an exact ratio between a ſolar day and a ſolar year, on which depends the continual alternate ſucceſſion of day and night. For the deſirable purpoſe of leſſening the number of wheels which would be required in two diſtinct trains, the inventor has very judiciouſly fixed upon two wheels which ſhall be common to both trains, *viz.* 365 and 59; the former of theſe, which is neceſſarily large, has no motion itſelf, but communicates a circular motion to the 59, by means of their teeth being connected, whilſt the latter is carried round it, by the annual bar, once in a year, and as theſe wheels are attached to the ſame ſtand which is uſed with the planetarium, the ſame handle and wheelwork which gives motion to the earth's radius vector there, will give motion to the annual bar here. A motion being once communicated to the wheel 59 in this manner, all the other motions of the wheelwork connected with this, and placed with it on the annual bar, will continue as long as the handle moves which actuates the annual bar. The trains made choice of are theſe; *viz.*

For the Earth's parallelifm - $\frac{59}{365} \times \frac{62}{10} = \frac{3658}{3650}$ or 1.002192

Diurnal and annual train - - $\frac{59}{365} \times \frac{10}{20} \times \frac{8}{40} \times \frac{10}{59} = 365^{d}\ 0^{h}\ 0^{m}$

In the firſt of theſe trains the product of the numerators or driven wheels ſhould have been exactly equal to the product of the denominators or drivers, in order that one retrograde revolution of the laſt moving wheel of 62 might be effected in exactly one direct annual revolution of the bar; or, in other words, the ratio ſhould have been equal to *unity*, which it exceeds, and therefore the parallelifm will not be conſtant, but will require a manual rectification as often as the error amounts to a ſenſible deviation. With reſpect to the other train, the value of which ought to have been

$365\frac{1^{d}}{4}$,

$365\frac{1}{4}$d, or rather $365^{d}\ 5^{h}\ 48^{m}\ 48^{s}$, the effect of its error is, that the diurnal motion, compared with the annual motion, loſes nearly a quarter of a day in every year, ſo that the horary index, if immediately connected with the tubed arbor of the laſt pinion of 10, and the annual index, are conſtantly at variance, and in the ſhort ſpace of four years, namely, on every biſſextile, this diſagreement amounts to a whole day. But the *quantum* of motion was not the only object of attention in the laſt, or diurnal pinion of 10, its *direction* alſo was to be attended to by the contriver, that the earth ſhould have its rotations from weſt to eaſt, otherwiſe they would not be natural; this, however, would not be the caſe without ſome additional wheel; for as the wheel of 59 revolves round the large wheel of 365 from weſt to eaſt along with the annual bar, and with it the wheel of 20 placed on the ſame arbor, the firſt pinion 10, and wheel 40, on the ſecond arbor, have their motion retrograde; then the third arbor with the pinion 8, and wheel 59, are again direct, and the laſt arbor, or tube, with its pinion 10, becomes in its turn retrograde; and if the earth had been immediately connected with this tube, its motion would conſequently have been retrograde too. The two wheels of each 59 might indeed have been omitted, without affecting the calculation, one being a multiplier, and the other a diviſor, and then there would have been one arbor fewer; but then the axis of the earth was to have an inclination, which it could not have if placed on the tube of the laſt pinion 10, two additional pinions, therefore, became neceſſary, one on the upper end of the tube, and the other on the retrograde bar of parallelism where the axis is fixed, on which the earth revolves; theſe two pinions are each 10, it being of no conſequence what they are, provided they be ſimilar; but hence ariſes a new motion, which the inventor probably did not ſuſpect, when he made his calculation for 365 days; for as the bar of parallelism revolves *backwards* once in a year, and carries the pinion connected with the earth's axis backwards along with it, whilſt its teeth are connected with the teeth of the central pinion on the tube, this pinion makes one retrograde revolution in a year *from this cauſe*, and brings the earth back again one entire revolution in that time, ſo that, in fact, the earth, by this mechaniſm, makes only 364 complete revolutions on its axis in each year, inſtead of 365, for which the calculation was made; hence, an horary index is altogether uſeleſs, if placed on the earth's axis; and if placed on the tube, which revolves 365 times, it would not correſpond with the earth's rotations by one day in a year; and this defect being found out, was probably the reaſon why no horary index is deſcribed as belonging to this inſtrument.

But there remains yet a further deduction of a day in the year, in this inſtrument, to be explained, which reduces the number to only 363, but which is not connected with, nor dependent upon, the diurnal train: this ariſes entirely from the retrograde motion of the annual bar of parallelism; it is a truth, perhaps not much, if at all, noticed by inſtrument-makers, though not the leſs true on that account, that provided the earth had no diurnal motion at all during its annual progreſs, the circumſtance of its axis being always parallel to itſelf, would produce juſt one day in a year, with this remarkable phenomenon, that the ſun would riſe, or appear to riſe, in the *weſt*, and ſet in the *eaſt*, which is juſt the reverſe of the ſun's apparent motion produced by the earth's rotation: this day, ariſing from the annual motion, would have added another day to the days in a year if the earth's rotation had been from eaſt to weſt, and what is now the number of ſidereal days, would then have been ſolar, without the addition of this one, that is to ſay, an inhabitant of any part of the earth would tranſit the meridian ſolar ray 367 times; for the real rotations of the earth would produce 366 tranſits, and one more would be derived from the annual gyration which preſerves the parallelism by preſenting every point of the earth ſucceſſively to the ſun in the courſe of the year. On the contrary, becauſe it happens that the earth's rotations are from weſt to eaſt, and the annual gyration from eaſt to weſt, in this caſe the *annual day*, as it may be called, is a deduction from the ſolar tranſits, which therefore are $366 - 1$, or 365, omitting the fraction; hence in every inſtrument which exhibits the diurnal and annual motions, and alſo the parallelism of the earth, the actual rotations of the earth produced by the train of wheelwork ſhould be 366, as in nature, ſeeing the bar of parallelism deducts one ſolar day in every year; but it has been ſhewn that the rotations of the earth, in the tellurian in queſtion, are actually only 364, ariſing from the whole operation of the diurnal train, and two additional pinions, from which we muſt further deduct one for the drawback of the annual gyration, which deduction leaves only 363 actual ſolar days exhibited by the mechaniſm. The following alteration would obviate theſe defects of two days' motion ariſing from decompoſition; let both the wheels of 59 be left out of the train; its value would not be affected thereby, but there would be only three arbors, including the tube, inſtead of four; the earth then would rotate 365 times the wrong way about, or from eaſt to weſt, by means of the train, and once more the *ſame way about*, in this caſe, by means of the ſecond pinion, on the bar of parallelism as it revolved round the central pinion of the ſame number fixed on the tube, which would make 366 rotations; add now a third pinion to the earth's axis, and it will revolve 366 times from weſt to eaſt, and the annual gyration will make the neceſſary deduction, but ſtill there would be a defect of $5^{h}\ 48^{m}\ 48^{s}$ in each year.

*The Lunarium Portion.*—Lunarium is alſo a word which we think occurs in the author before us for the firſt time; its import is an inſtrument which exhibits the motions of the moon (luna), or otherwiſe an appendage to another more comprehenſive inſtrument, in which it performs this office when attached. The principal motions of this ſecondary planet are, 1ſt, the monthly motion, which may be conſidered either as the period that begins and terminates with a ſtar, or with the ſun, the former of which is called the periodic revolution, and the latter the ſynodic revolution, or a lunation; 2dly, the anomaliſtic revolution, which is ſhorter than a lunation, but longer than a periodic revolution, by reaſon of the line of the apſides having a progreſſive motion in the ecliptic, which the moon has to overtake; and 3dly, a revolution in regard to the nodes, which is the ſhorteſt of all, by reaſon of the ſlow retrograde motion of the line connecting the nodes, which meets the moon in every lunation. Theſe three periods have each a ſeparate train of wheels, in each of which the common pair $\frac{59}{365}$, uſed in the tellurian, forms the firſt portion; the three trains, with their values in time, are theſe, *viz.*

| | | D. | H. | M. |
|---|---|---|---|---|
| Moon's ſynodic revolution | $\frac{59}{365} \times \frac{20}{20} \times \frac{10}{20}$ | 29 | 12 | 0 |
| Moon's apogee | $\frac{59}{365} \times \frac{70}{10} \times \frac{78}{10}$ | 3221 | 9 | 36 |
| Moon's nodes | $\frac{59}{365} \times \frac{18}{6} \times \frac{30}{6} \times \frac{48}{6}$ | 7080 | 0 | 0 |

The large wheel of 365 is here again a fixed wheel, round which

which all the other wheels are carried by the annual bar, as in the tellurian, which is taken from the ſtand, when the preſent mechaniſm is put on, and as the wheel 59 has its teeth in connection with the large wheel, it revolves the ſpace of one tooth in every day, as the year advances, and finiſhes its revolution in 59 days, $\frac{1}{59}$ or $\frac{1}{2}$ of which is $29^d\ 12^h\ 0^\circ$, the ſynodic revolution, in which the error is $44^m\ 3^s$ nearly, an error of too much magnitude to be overlooked by a mathematician, if he had been anxious for the accuracy of his inſtrument. The next train is calculated to make an elliptic ring, repreſenting the moon's orbit, advance through the 12 ſigns of the ecliptic in the period ſpecified, which, according to La Lande, ſhould have been 3231.35791 days, ſo that the error is nearly ten days in this period. The laſt train carries round an inclined circular plate or ring, moveable on an axis inſerted at the nodes, to ſhew the moon's variation of latitude; the retrograde period of this plate, according to La Lande, ſhould have been 6798.20337 days, the error therefore is ſtill more conſiderable than in the laſt motion, its amount being a ſpace in the ecliptic equal to 281.79663 days' motion.

From the examination which has here been detailed of Martin's planetary numbers, the reader, it is preſumed, will not think the inference unfair, if we aſſert that the various inaccuracies which have been pointed out, ſhew the propriety of abandoning theſe numbers in future, and of ſubſtituting others which ſhall exhibit the various motions more faithfully.

*Orrery for the Motions of the Sun, Moon, Earth, and interior Planets, by the Rev. W. Pearſon.*—During the time that Mr. Pearſon reſided at the city of Lincoln, he wiſhed to procure an orrery at a moderate expenſe, and conſtructed from numbers which might have ſome pretenſions to accuracy, but not being able to accompliſh his wiſh, after a correſpondence with an inſtrument-maker in London on the ſubject of his enquiry, he determined to try if he could not contrive an inſtrument himſelf to be made under his direction by an ordinary clock-maker. After ſome conſideration he deviſed the mode of calculation, which, under our article NUMBERS *Planetary*, we have called the *indirect method* of calculation, by which he ſoon aſcertained numbers ſuitable for his wheelwork. He found it convenient, however, to adopt the annual train of Ferguſon, which, at that time, he thought ſufficiently accurate; this train he tranſmuted into $\frac{14}{300} \times \frac{14}{46} \times \frac{16}{83} = 365^d\ 5^h\ 48^m\ 58^s$. The large wheel of 300 formed the plate that was graduated on its plane into a quadruple ſpiral of days, an ecliptic circle, and a declination circle, and was ſupported by claw feet, but not at its centre. The axis of pinion 16 had the arbor for the diurnal handle, and was carried along with the reſt of the train on bridges, under an oblong box that moved round the ſun in a year, and that contained the wheels of the moon and of the earth's parallelism at the remote end, and the wheels of Venus near the centre; to the under face of the annual box was made faſt a large wheel of 120, which drove the trains of Mercury and the Sun, ſupported by bridges under the large plate; the motions were taken by pinions above the plate, having their arbors paſſing down through it till they reſted on the cocks beneath; the laſt wheel of Mercury had a long tube which penetrated the ſun's ſtem and carried an arm at the top, which, by its mechaniſm, ſhewed both the equation of the centre, the variation of diſtance, and the heliocentric latitude, as ſeen in *fig.* 3. *Plate* IV. of *Planetary Machines*, and explained under the article EQUATION *Mechaniſm*. The arbor of the ſun's laſt wheel paſſed again through Mercury's tube, and gave the proper motion to his inclined axis by the medium of three ſimilar pinions, one on the ſaid arbor, one on the ſun's bearing piece, and one on his axis. As we have not given a drawing of this orrery, we ſhall not enter into a minute detail of the poſition of the different wheels and other parts, but ſubjoin a table of the trains and their correſponding values, which will give the reader a competent idea of its powers when carrying a three-inch globe with its furniture at $7\frac{1}{2}$ inches from the ſun, and the other planets at proportional diſtances, while Venus alſo moved in her inclined orbit by means of her arm having a joint at the ſun's ſtem, and reſting on an inclined graduated circle.

TABLE of the Trains &c.

| | | D. | H. | M. | S. |
|---|---|---|---|---|---|
| The Earth's wheels | $\frac{14}{300} \times \frac{14}{46} \times \frac{16}{83}$ | 365 | 5 | 48 | 58 |
| Its parallelism ditto | $\frac{120}{100} \times \frac{100}{120} = \frac{1}{1}$, or one revolution. | | | | |
| Moon's ſynodic do. | $\frac{14}{300} \times \frac{90}{21} \times \frac{38}{94}$ | 29 | 12 | 43 | 31 |
| Moon's anomal. do. | $\frac{28}{30}$ of a lunation | 27 | 13 | 28 | 37 |
| Moon's nodes | $\frac{20}{102} \times \frac{121}{25}$ | $18^y$ | 224 | 18 | 21 28 |
| Trop. rev. of Venus | $1 + \frac{63}{97} \times \frac{40}{40} \times \frac{96}{39}$ | 224 | 16 | 42 | 7 |
| Do. of Mercury | $\frac{15}{120} \times \frac{79}{41}$ | 87 | 23 | 16 | 44 |
| Sun's rotation | $\frac{30}{120} \times \frac{27}{97}$ | 25 | 9 | 59 | 32 |

Three pinions of 15 for the earth's axis.
Three pinions of 8 for the ſun's axis.

Mercury's excentric motion $\frac{8}{25} \times \frac{25}{8} = \frac{1}{1}$ revol.

Three pinions of 30 for the moon's phaſes.

Theſe wheels were all put in motion by a common watch movement, by means of a pinion of 8 inſerted on the fuſee arbor, and driving a ratchet-wheel of 48 on the diurnal arbor, which, by means of the ratchet, turned without affecting the going of the watch during the time of lecturing. This was the ſmall orrery mentioned in Dr. Thomas Young's lectures, as being the moſt accurate of any he had examined, and certainly is more accurate than any that preceded it. Its rectifications and uſe will be underſtood from what will hereafter be ſaid, when other inſtruments have been deſcribed, which appear to merit a more particular deſcription by the aid of drawings.

*The Orrery invented by Joſ. Prieſtley, eſq. of Bradford in Yorkſhire.*—Mr. Prieſtley, a relative of Dr. Prieſtley, contrived and ſuperintended the conſtruction of an orrery in the year 1801, for Dr. Birbeck, who ſucceeded the late Dr. Garnett in the profeſſorſhip at Anderſon's univerſity, in Glaſgow, which orrery was made by Thomas Liſter, an induſtrious clockmaker of Hallifax, in the ſame county.

As we have been favoured with a deſcription of this inſtrument by the ingenious inventor, and alſo with a ſketch of the covering plates by the workman himſelf; we ſhall have little more to do in the account than to copy this deſcription, to examine the calculations adopted by the contriver,

contriver, and to make ſuch obſervations as have occurred in the examination.

The wheelwork, according to Mr. Prieſtley, is contained in a round box of braſs, thirty inches in diameter, and about four inches in depth; having the figures, repreſenting the ſigns of the zodiac, painted in enamel upon the ſide. The planets move in orbits at the exact proportional diſtances from the ſun, the mean diſtance of the earth being five inches, each orbit having its proper excentricity and inclination; and the periodic times, as well as the inequality of motion in each revolution, are nearly ſuch as are found by the lateſt obſervations.

The covering plates, which are painted blue, have narrow openings between them, through which paſs the ſtems which carry the planets: theſe openings repreſent the orbits; and their inclination to the ecliptic is produced by ledges raiſed round the openings. Adjoining theſe ledges are divided circles, on which the latitude, the nodes, and the apſides, are marked. The ball repreſenting the planet is fixed to a ſocket, which fits the ſtem, and reſting on the ledges, riſes and falls as the planet approaches or recedes from the north pole of the ecliptic.

The large gilt ball, repreſenting the ſun, moves round its axis, according to our author, in $25^{d}\ 15^{h}\ 16^{m}$, and the axis itſelf has the proper inclination and poſition given to it.

The orbits of Jupiter and Saturn extending beyond the circumference of the box, arms are neceſſarily uſed for theſe two planets. There are two ſeparate arms for Jupiter; one of which has wheelwork, that accurately exhibits his diurnal revolution, and the motions of his ſatellites in their reſpective orbits. Either arm may be put upon the two ſtrong wires that riſe out of the box, and move in an orbit left between the covering plates, concentric with Jupiter's, on the outſide of the orbit of Mars. When that arm, which ſhews the motions of the ſatellites, &c. is uſed, a bevel pinion is put on a ſquare axis paſſing from the wheelwork in the box, between the two ſtrong wires above-mentioned; this pinion acts in another, attached to a ſpindle paſſing through the hollow arm, and communicates motion to the train under the body of Jupiter.

The arm of Saturn, being very long, is ſupported by a ſtay, carrying a bar with two friction-wheels; which roll along the bottom moulding of the box. This arm, where it approaches the box, ſeparates into two branches, and is fixed to two ſtuds, that riſe above the covering plates. Theſe ſtuds are carried round along with a narrow rim, adjoining to the ecliptic and other circles deſcribed on the margin of the top of the box. This rim, not being in the plane of the box, occaſions the arm to riſe and fall during a revolution, cauſing the ball, repreſenting Saturn, to deſcribe an orbit, having a proper inclination to the plane of the ecliptic.

The ſtem ſupporting the ball and ring of Saturn iſſues out of a ſmall circular plate, divided into the ſigns and degrees of the ecliptic, and moveable on its centre at the extremity of the arm; this centre being perpendicularly under that of the ball. On this ſtem the ſatellites are moveable by the hand, and it has the proper inclination with reſpect to the plane of the ecliptic. By placing over the arm the ſame ſign and degree of this ſmall ecliptic that Saturn then occupies, the planes of the ring and of the orbits of the ſatellites will obtain their true poſitions.

The heliocentric places of the planets are ſhewn on an ecliptic circle, drawn on the outermoſt fixed rim of the top of the box: the year is pointed out by an index fixed to the arm of Saturn, and the day of the month is ſhewn on a circle adjoining to the earth's orbit. The proportional magnitudes of the planets, but not of the ſun, are nearly ſhewn in this orrery.

The Georgian planet and his ſyſtem of moons compoſe a ſeparate inſtrument, to be put on any convenient ſtand, and placed at the due diſtance from the ſun in the orrery. The centre of his orbit is at 4.54 inches from that of the ſun, in a line with $11^{s}\ 17^{\circ}\ 22'$. At this point a ſmall pin may be ſcrewed into the covering plates, and a ſtring, 96 inches long, ſtretched from them to meet another ſtring proceeding from the point under the ſun's centre, laid over the degree of the planet's heliocentric longitude, will give his true ſituation. The longitude is ſhewn on a ſilvered plate under this ſeparate ſyſtem for ſeveral years to come; and this plate, by means of the ecliptic circle engraved upon it, ſerves alſo to place the axis of the planet, and the plane of the orbits of his moons, in the right ſituation in the manner above deſcribed for Saturn.

The unequal motion of the planets in the different parts of their orbits has been attempted to be ſhewn; and the velocities in this orrery will be found to agree, nearly, with the Keplerian law of equal areas, deſcribed in equal times. Two methods have been employed for this purpoſe; for the inferior planets and Mars, that which is deſcribed as "*Mr. Joſeph Prieſtley's Contrivance*," under EQUATION, is employed; but the earth, having a ſyſtem of wheelwork to carry along with it, would not conveniently admit of the ſame contrivance; and Jupiter and Saturn being placed on arms, which extend beyond the box of the orrery, the ſame method could not be adopted for thoſe planets. In theſe three inſtances, the variation of motion in queſtion is obtained by an inequality among the teeth of the wheels, which carry theſe bodies round the ſun, the proper method of dividing or cutting which is deſcribed in the article already referred to.

With reſpect to the phenomena ariſing out of the motions of the earth, &c. the machinery admits of four changes; *viz.*

1. In ſhewing the general appearances of the ſolar ſyſtem, a ſmall ivory ball, proportioned to the ſize of the other planets, and a bead repreſenting the moon, are uſed: in this caſe the parallelism of the earth's axis and the moon's motion round the earth are ſhewn; but not the earth's diurnal motion.

2. The ball and bead above-mentioned being removed, an apparatus is put on in their place for ſhewing the apparent, ſuch as the direct, retrograde, and ſtationary, motions of the primary planets; and the geocentric place of any planet is ſhewn by an index on a ſmall ecliptic circle under the earth.

3. This apparatus is changed for a ſmall circular plate, the centre of which occupies the place of the earth, and its rim is divided into the points of the compaſs. This plate, which is intended to repreſent the rational horizon of the place, can be fixed to the inclination proper for the latitude of the ſpectator's ſituation, and its meridian line being brought to paſs through the ſun, and the hour index being ſet to 0 hours, the orrery is rectified for ſhewing, in the moſt natural manner, the phenomena and correſponding times of the riſing, ſouthing, and ſetting of the ſun and planets. By turning the winch ſlowly, and keeping the eye in the plane of the horizon circle, the planets will appear to aſcend above and deſcend below that circle exactly as they would do in nature, at the time for which the orrery is rectified. A thread fixed to the centre of this horizon, and ſtretched to any of the planets, will ſhew its bearing and

the angle made by the thread and horizon, or angle of altitude, for the time pointed out by the hour index.

4. Laſtly, to the proper ſtems which riſe from the wheelwork within the box, are adapted a ſmall terreſtrial globe, and a ball repreſenting the moon: the globe has the annual and diurnal motions, and that by which the parallelifm of its axis is maintained: the moon moves round the earth in an orbit properly inclined; having the retrograde motion of the nodes, and a motion on its axis to ſhew the phaſes. Behind the globe repreſenting the earth is placed a ſmall ſtem, carrying a circle of illumination to divide the enlightened from the other hemiſphere. This part of the apparatus, though ſufficiently large to ſhew the general phenomena reſpecting the moon, the viciſſitudes of the ſeaſons, and the different lengths of the ſucceſſive days and nights, does not interfere with the motions of the planets.

The wheelwork is ſo contrived, that one turn of the handle anſwers to 24 hours of mean ſolar time; when a quicker motion is required a change can be inſtantly made, ſo that one turn is equivalent to ten days: this latter motion will be found more convenient when the relative velocities of the planets round the ſun, the inequality of the motion of a planet in the different parts of its orbit, and the apparent motions as ſeen from the earth, or other place in the ſyſtem, are exhibited as objects of peculiar attention. When the planets are truly placed in their orbits for any given time, the wheelwork will preſerve, ſufficiently near, for many years paſt or to come, their proper ſituations.

To ſhew the time of the riſing, ſouthing, and ſetting of the heavenly bodies, a ſmall hour circle, with an index, is placed near the earth, and carried with it round the ſun.

This orrery was conſtructed with the deſign of its being placed on a ſtand, which would admit of its being inclined towards, or turned back from the audience, and at the ſame time of being moveable on an axis round its centre, ſo as to bring any part of the ecliptic in front. When the face of the orrery is inclined towards the company, the poſition, excentricity, &c. of the orbits, and the motions and magnitudes of the planets, are more conſpicuous; and the motion on the axis is uſeful for bringing the inſtrument into the moſt favourable point of view, during the deſcription of any particular phenomena; and when the planes of the orbits are turned out of a horizontal poſition, the handle may be inſerted into a hole made beneath the box, in which ſituation the lecturer's aſſiſtant may conveniently turn the handle, whilſt the lecturer is deſcribing the effects produced by the particular portions of the mechaniſm.

To demonſtrate in the moſt natural manner the phenomena of the apparent places, motions, &c. of the planets, as ſeen from the earth, proviſion is made among the wheelwork, for carrying a large radial rim, the centre of which coincides with that of the earth, during the revolution of the latter round the ſun; on the inſide of this rim is drawn, or intended to be drawn, the ecliptic with the conſtellations, or principal ſtars thereof that lie within 10° on each ſide of it. The apparatus for ſhewing the apparent motions of the planets, above deſcribed, is to be uſed along with this rim; when the wire paſſing through the centres of the earth and planets will ſhew, by means of a ſmall bead affixed to its extremity, the apparent place, and motion of the object among the ſtars of the zodiac, exactly as they would appear at the time to the eye of a ſpectator, viewing the ſame in the heavens from the ſurface of our globe.

The wheelwork conſiſts of the following trains; *viz.*

From the handle $\frac{55}{9} \times \frac{72}{10} \times \frac{83}{10} = 365.2$, that is, one turn *per* day very nearly; or by moving a ſlide the portion $\frac{55}{9}$ is diſcharged, and the train becomes $\frac{22}{36} \times \frac{72}{10} \times \frac{83}{10} = 36.52$ turns in a year, or one turn in ten days very nearly.

The large wheel of 83 teeth revolves once in a year, and gives motion to the ſeveral wheels and pinions placed round it, which produce the periodical revolutions of the planets, as under; *viz.*

| | | D. | H. | M. | S. |
|---|---|---|---|---|---|
| Sun | $\frac{9}{83} \times \frac{13}{18} = 12.76923$ {rotations *per annum*, or one, as it reſpects the Earth, in} | 28 | 14 | 28 | 30 |
| Mercury | $\frac{8}{83} \times \frac{40}{16} = \frac{320}{1328}$, or $\frac{20}{83}$ of $365.^{d}24$ | 88 | 0 | 13 | 52 |
| Venus | $\frac{12}{83} \times \frac{102}{24} = \frac{1224}{1992}$, or $\frac{51}{83}$ of ditto | 224 | 10 | 11 | 23 |
| Mars | $\frac{12}{83} \times \frac{156}{12} = \frac{1876}{996}$, or $\frac{156}{83}$ of ditto | 686 | 11 | 24 | 15 |
| Jupiter | $\frac{48}{83} \times \frac{164}{8} = \frac{7874}{664}$, or $\frac{984}{83}$ of ditto | 4330 | 1 | 46 | 52 |
| Saturn | $\frac{88}{83} \times \frac{222}{8} = \frac{19536}{664}$, or $\frac{2442}{83}$ of ditto | 10745 | 23 | 25 | 57 |
| Diurnal Motion | $\frac{10}{397} \times \frac{10}{46} \times \frac{12}{24} = 365.24$, or | 365 | 5 | 45 | 36 |
| Parallelifm | $\frac{19}{235} \times \frac{47}{19} \times \frac{30}{6} = \frac{26790}{26790} = 1$ year, or | 365 | 5 | 45 | 36 |
| Lunation | $\frac{19}{235}$ of 365.24 | 29 | 1 | 43 | 15.6 |
| Moon's Nodes | $\frac{56}{59}$ (eſtimated thus $\frac{56}{3}$) $= 18\frac{2}{3}$ years | 6817 | 20 | 48 | 48 |

In

In this analyſis of the wheelwork and their powers, it is to be underſtood that the 83 is the ſame wheel in each train, and that the large wheel of 397, in the train of the diurnal motion, is fixed immoveably, but gives motion to the firſt pinion 10, which is carried round it by the annual motion: the laſt pinion 12 of this train has an axis which paſſes through the other ſockets, and communicates, by means of three ſmall equal wheels, a proper motion to the earth's axis.

The inventor ſays that the diurnal motion of the earth, and the motions of Jupiter's ſatellites, were not originally intended to make a part of this machinery; that is, it was intended to be ſimply a planetarium, but it was afterwards converted into an orrery. We entertained our doubts whether in this conſtruction of the train, that regulates the daily motion, the earth's motion on its axis would be uniformly ſteady, but in a ſecond communication from the author we learnt, that "by accurately proportioning the ſizes of the wheels and pinions, and uſing high numbers in this train, the ſmall globe is made to revolve with regularity, and without any inconvenient friction or ſtreſs on the teeth." For the moon's phaſes there is, moreover, a ſucceſſion of three equal wheels, the firſt made faſt to a central ſocket in the uſual way.

For the motions of Jupiter and his moons the following machinery is uſed. On the lower end of the ſquare axis, (paſſing from the wheelwork in the box between two ſhort wires,) ſtanding perpendicular to, and carried round with the wheel that produces Jupiter's revolution, is put a pinion of 10, which is driven againſt the 183 teeth cut in the inſide of the rim-like wheel, having 216 teeth on its outſide, which 216 teeth are adapted to the wheel of 72 teeth in the train of the handle. By theſe means the ſaid ſquare axis will move round by the train $\frac{55}{9} \times \frac{72}{10} \times \frac{216}{72} \times \frac{10}{183} = \frac{55}{9} \times \frac{216}{183} = \frac{55}{1} \times \frac{24}{183}$ $= 7\frac{39}{183}$, or 7.21918 days coming directly from the handle; but the pinion of 10 teeth is carried by Jupiter's arm $\frac{183}{10}$ or 18.3 revolutions backward in each period of Jupiter, each of which is equal to 7.21918 days; therefore, the whole drawback is 7.21918 × 18.3 = 132.114 days; hence we muſt ſay, as $4330.^{d}0741 : 132.^{d}114 : 7.^{d}21911 : 0.^{d}22026$; this quantity taken from $7.^{d}21918$ leaves $6.^{d}99892$ for the true period of the arbor of pinion 10 to revolve in, as the firſt mover of the four pair of wheels and pinions for Jupiter's ſatellites. The motion of the arbor of the pinion 10 is tranſmitted to the common arbor of the drivers by the train $\frac{9}{66} \times \frac{88}{12} = \frac{792}{792}$, or unity; therefore the common vertical arbor turns in the ſame time as the one at the interior end, and the pinions of tranſmiſſion are put at the oppoſite ends of a long arbor paſſing through the middle of Jupiter's tubed arm, and act with each a contrate wheel of the numbers above ſtated.

The wheelwork of the four ſatellites of Jupiter, as well as of his diurnal motion, are theſe, with their annexed values, *viz.*

| | | D. | H. | M. | S. |
|---|---|---|---|---|---|
| Jupiter's wheels $\frac{7}{118}$ | of 6.99892 | 0 | 9 | 57 | 52 |
| 1. Satellite $\frac{21}{87}$ | of ditto | 1 | 16 | 32 | 43 |
| 2. Ditto $\frac{33}{65}$ | of 6.99892 | 3 | 13 | 16 | 44 |
| 3. Ditto $\frac{85}{83}$ | of ditto | 7 | 4 | 1 | 17 |
| 4. Ditto $\frac{79}{33}$ | of ditto | 16 | 18 | 7 | 11 |

Of theſe numbers it may be obſerved that they are not ſo accurate as Roemer's, which take their motions from a period of ſeven days, which is very nearly alſo the period of the common arbor in this inſtrument that contains the drivers.

*The new Orrery for equated Motions in three Parts, by the Rev. W. Pearſon.*—After the planetarium, conſtructed at the Royal Inſtitution, had been finiſhed under Mr. Pearſon's ſuperintendance, he calculated numbers proper for a tellurian and lunarium to be combined into one inſtrument, as a neceſſary accompaniment, with a view to have it conſtructed for the uſe of the inſtitution; but circumſtances prevented ſuch meaſure being put in execution, or even being propoſed to the managers. In the year 1805, however, the plan was put into the hands of Fidler, who completed the inſtrument in a very perfect manner for the inventor himſelf. In the following year the ſame gentleman added both the planetarium portion, and the ſatellite portion, to be ſucceſſively applied to the ſame inlaid mahogany ſtand, which three portions, accurately made, and ſeparately applied, conſtitute an orrery the moſt perfect, perhaps, in its operations, of all the machines that have hitherto been invented in any country. As the PLANETARIUM and SATELLITE portions of this ſuperb orrery form ſeparate inſtruments individually, we ſhall, agreeably to our propoſed plan, defer the deſcription of both theſe till we arrive at the articles themſelves, under their appropriate titles; and ſhall confine ourſelves in this place to a detail of the parts that conſtitute the firſt portion, or tellurian and lunarium united; which portion may, according to our definition, be conſidered in itſelf as the moſt eſſential feature of the orrery: but in the mean time, it may be proper to mention, that the motions of the primary planets, in the planetarium or ſecond portion, move in excentric orbits with their variable diſtances and velocities, making equal areas in equal times in their exact periodical times; and that the third portion, containing the ſyſtem of Jupiter and his moons, together with the proper motion of the earth, produces the periodic times with a degree of accuracy never before accompliſhed by mechanical means. The three portions are applied, or may be applied, in ſucceſſion, to the ſame ornamental ſtand, as the ſubject may demand, or they may have each a ſeparate ſtand.

An inſtrument capable of repreſenting with extreme accuracy, and on a large ſcale, all the motions of the earth and the moon at the ſame time, had long been a deſideratum in the philoſophical world. For while the attention of the mathematical inſtrument-maker was occupied by ſtudying portability and neatneſs in conſtructing the tellurian and lunarium, as detached portions, to be applied ſucceſſively to the ſame ſtand, the utility of the inſtrument, ſo diſunited, became circumſcribed; inaſmuch, as all the phenomena, which depend upon the motions of the earth and moon, taken conjointly, are inexplicable by it. It muſt be allowed, indeed, that from obſerving the modern tellurian in motion, a ſpectator might form a competent idea of the natural ſucceſſion of the ſeaſons, and of day and night; likewiſe, by attending to the lunarium he might ſee the cauſe of eclipſes and lunar aſpects explained; but, as to

the *time when*, and the *places* on the globe *where* any eclipſe will be viſible; and alſo as to the ſolution of all the numerous variety of problems which have a reference to *time* and *place*, the modern inſtruments on ſale leave us entirely to the wide field of conjecture. The tellurian and lunarium, as heretofore conſtructed, not only explain by *halves*, effects, which the *mind* muſt afterwards combine, but have their wheelwork ſo imperfectly calculated and arranged, that even thoſe partial repreſentations, which they profeſs to exhibit, are very inaccurate: for inſtance, all the tellurians, which we have had occaſion to examine, in the different ſhops of London, make the ſolar year to conſiſt of an *entire day* too much, or elſe too little; to ſay nothing of the fractional portion of a day, which ſome of them omit to take into the calculation, notwithſtanding a ſupplementary day ought to be provided for in every leap year.

Theſe, and other inaccuracies, both in the lunar motions, and in the earth's annual courſe, (by the latter of which the ſummer and winter half-years are improperly made to conſiſt of an equal number of days,) pointed out the neceſſity of having a new inſtrument conſtructed, which might correct the errors, and ſupply the defects of the very imperfect ones, which had heretofore been uſed in ſeminaries and public lecture-rooms.

The inſtrument, which we here offer to the public notice, is, we underſtand, the reſult of much contrivance, and of great labour in aſcertaining, by numerous calculations, the moſt accurate poſſible numbers for its wheelwork. The hours which had been ſpent, in analyſing the various inſtruments which were made during the laſt century, produced a conviction; that though much had been attempted and profeſſed to be done by different men on the preſent ſubject; yet no real improvement, ſince the days of Huygens, had actually been effected in inſtruments for explaining celeſtial phenomena; unleſs, indeed, the ſcenic effect produced by the Eidouranion be conſidered as an improvement. Aſtronomers without mechanical ſkill, and artiſts without ſufficient ſcience, alike laboured under difficulties, in the contrivance and execution of ſuch an inſtrument as may be deemed perfect of its kind; and how far the pretenſions of the contriver of this machine for uniting the two requiſite qualifications may be well founded, will beſt be proved by an examination of the inſtrument itſelf.

*Plate* V. of *Planetary Machines* repreſents a perſpective view of the firſt portion of the orrery on a reduced ſcale, as ſeen when put together.

A B is a circular table or ſtand of mahogany two and a half feet in diameter, to which is faſtened immoveably the large contrate wheel of 269 teeth. C D is a bar of braſs, which revolves round the centre piece of cylindrical braſs E upon a ſhoulder, and reſts alſo near the extremity of the table on the braſs friction-wheel above A, and is called the *annual* bar, by reaſon of its being carried once round in a year; at the remote end of this bar, beyond C, is fixed the annual index, that points out in a quadruple ſpiral, drawn on a braſs rim on the ſurface of the table, the days of the month in the firſt, ſecond, third, or fourth ſpiral line, accordingly as the year may be leap year, or the firſt, ſecond, &c. after; and alſo indicates the ſun's place in the ecliptic and his declination in two interior circles, as well as his mean anomaly and correſponding equation of the centre; all which graduations are engraved along with the ſigns of the ecliptic. The ſmall contrate wheel of 62, which appears in an inverted poſition above E, is alſo fixed faſt to the central braſs piece; but all the other parts of the mechaniſm are carried by the annual bar, either above it, or below it; and the wheels borne by it are put into motion, as it goes round, partly by means of the pinion of 10, hidden with the long arbor under the annual bar, being connected with the fixed wheel of 269, and partly by the pinion of 8 on the long arbor above it, being acted upon by the immoveable wheel of 62.

The train of wheels, which carries the annual bar round, and alſo gives the daily motion to the earth, is compoſed of the exact ratio between a day and a ſolar year, and conſiſts of the following numbers, *viz.* $\frac{10}{269} \times \frac{10}{26} \times \frac{18}{94} = \frac{1800}{657436}$ which ratio inverted is equal to $365^{d}\ 5^{h}\ 48^{m}\ 48^{s}$.

This train is agreeable to Lalande's determination of the ſolar year *exactly*, there being not an error of ſo much as even the fractional portion of a ſecond in a year: hence, when the machine has been made to revolve for the ſpace of a million years, it will require no rectification of this train, it being as accurate as the tables themſelves, whence the ſun's place is taken from the Nautical Almanac. The manner in which the foregoing train is arranged, to produce its effect, is thus; the large wheel of 269, which is immoveably fixed to the table, gives motion to the firſt pinion of 10, which is concealed on the interior end of the long horizontal ſteel arbor placed under, and parallel to the annual bar, whilſt this bar moves forwards; then the contrate wheel of 26 being faſt upon the ſame arbor, which is lowered from its place above A to be ſeen, revolves in the ſame time, and actuates the ſecond pinion of 10, placed on the firſt perpendicular arbor, and ſupported by a cock F beneath the annual bar, on which perpendicular arbor is alſo fixed the wheel of 94 above the annual bar and under the bridge G, into which the upper end of this arbor is pivoted. Laſtly, the wheel of 94 drives the ſmall wheel of 18 (not ſeen) round in an exact day; which laſt wheel is ſoldered to the lower extremity of a long tube almoſt ſix inches long, that bears alſo the ſmall wheel of 40 on its ſuperior end, for the purpoſe of communicating motion to a ſimilar wheel, placed on the earth's axis, by the help of an intermediate wheel; which three wheels have ſimilar numbers of teeth and dimenſions; the long tube is ſupported by, and revolves upon, a long poliſhed piece of ſteel, ſcrewed home into the annual bar, and kept faſt to its place by a tapped nut below the bar, which perpendicular piece of ſteel, or ſtem, is turned in a lathe in ſuch a way that the two extremities of the revolving tube move freely upon it without ſhake, but with as little friction as poſſible, for which purpoſes the whole length of the ſtem is a little diminiſhed in diameter, except at the two ends, on which the extremities of the tube revolve. By this portion of the mechaniſm the *exact* proportion is preſerved between a ſolar day and a ſolar or tropical year.

The next portion is that part of the mechaniſm by which the earth's axis is preſerved parallel to itſelf in every part of its annual orbit; this conſiſts of two contrate wheels of ſimilar dimenſions, each containing 62 teeth, one placed with the teeth downwards faſt to the central ſtem above E, and the other revolving above the bridge G with its teeth uppermoſt, that its motion may be in a retrograde direction, and round a long tube made faſt to the bridge, which is interpoſed between the tube of wheel 18, and the tube on which the wheel 62 is faſtened, ſo that the fixed intermediate tube of the bridge keeps the other two tubes from touching one another, and ſerves as a ſtem for that of wheel 62. The motion is communicated, from the fixed to the revolving wheel, by means of two ſimilar pinions of 8, which may be of any number of teeth, placed at oppoſite ends of the long horizontal ſteel arbor, which revolves parallel to and above the annual bar, by means of the connection that the interior

pinion

pinion has with the fixed wheel, while the annual bar is in motion: the horizontal arbor is pivoted into the bridge H at one end, and into a cock K at the other. On the ſuperior end of this third tube, or tube of 62, is placed, in an adjuſtable manner, the circular rim I, of nine inches diameter, on which an ecliptic circle is engraven, (and on which a circle of declination might be engraven alſo, inſtead of that on the table): to this rim is attached, by ſcrews, the bearing piece L, which ſupports a terreſtrial globe of nine inches diameter, fitted up with a quadrant, and moveable meridian and horizon circles to be adapted to any longitude and latitude. Again, by means of the retrograde motion of the ecliptic circle I of one revolution, for every direct revolution of the annual bar, the axis of the earth is made to point always to the ſame individual diſtant point in every part of its annual orbit; or, in other words, it preſerves its paralleliſm perpetually; on which circumſtance, together with the inclination of the axis, the viciſſitude of the ſeaſons depends.

Now, whilſt the little ecliptic circle revolves backwards once in a year, it carries the earth along with it, and therefore preſents every part of the globe ſucceſſively to the ſun's rays, by which operation, provided the earth had no rotation on its axis, one night and one day only would be the lot of its inhabitants in every year, and the ſun would appear to riſe in the weſt, and ſet in the eaſt, which phenomenon would really take place in nature, if the earth's motion on its axis were ſtayed, (of which circumſtance, we believe, aſtronomers have taken no notice.) To this phenomenon, however, it is owing, that an exact rotation of the earth, as it regards a fixed point in the heavens, conſtitutes not a ſolar, but a ſidereal day, the duration of which is only $23^{d}\ 56^{m}\ 3.^{s}43$ ſolar time, the difference between which and a ſolar day amounts to an entire day in every ſolar year; hence in every 365,242 natural days, the earth makes 366,242 rotations on its axis, which would be ſo many natural days, if the parallelism of the earth's axis were not preſerved, which parallelism effects a deduction of one day in a ſolar year, in the way that has been deſcribed: The queſtion then ariſes, how the additional rotation is given to the earth's axis by the mechaniſm before us? The effect is this; *viz.* while the central wheel of 40, under the end of the antarctic circle, revolves 365,242 times, the piece L, carried by the ſmall ecliptic plate, carries the next wheel of 40, or intermediate wheel, *round* the central wheel in a retrograde direction, while their teeth are in action, which circuit would give the intermediate wheel juſt one revolution, provided the central wheel had no motion at all; but the intermediate wheel receives by communication 365,242 revolutions from the central wheel, independently of the additional one in conſequence of the circuit; therefore, the total number of revolutions which it makes in a retrograde direction are 366,242, which it communicates to the third wheel of 40 placed on the earth's axis, without either addition or diminution; conſequently, the earth makes exactly 366,242 rotations in 365,242 natural days. It is to a want of attention to this circumſtance, that muſt be attributed the inaccuracy of our modern tellurians, for either an addition or ſubtraction, occaſioned by a compound motion derived from the annual circuit, has rendered them uſeleſs as to all the purpoſes connected with particular deductions. By this conſtruction of the inſtrument, both ſolar and ſidereal time are indicated on the ſame dial-plate M, placed on the top of the tube that revolves in twenty-four hours, by means of the two hands O and P, the former of which is placed on a fixed ſtem of ſteel, round which the tube revolves, and the latter, P, is carried in a retrograde direction by the ecliptic circle once round in every year, ſo as to meet any particular hour on the horary plate $3^{m}\ 56.^{s}57$ ſooner than it did on the preceding day; ſo that, if the two hands be put to the ſame hour on the day on which the ſun enters Aries, the ſpace on the horary plate contained between the two hands, on any day in the year, will be the difference between ſolar and ſidereal time, or, what is the ſame thing, the ſun's mean right aſcenſion for that day converted into time. In all problems relating to ſolar time, the hand O muſt be conſulted. N is a circular braſs plate, ſupported by the upper end of the tube which belongs to the bridge H, and has the days of the moon's age engraven on it, together with the times of her meridian paſſage, and the equations of the tides on each day of her age, according to her diſtance from the apogee. Q is the terminator for the circle of illumination, adjuſtable to any height; and at right angles to this terminator, a lens, R, is ſuſpended to produce a ſolar ray on the ſurface of the globe, adjuſted to the height of the centre of the earth, which points out where the ſun is vertical on any given day, as alſo the variation of declination, and a variety of other phenomena in a very ſtriking manner.

Another eſſential requiſite peculiar to this inſtrument is, that it makes ſummer as it is in nature, nearly eight days longer (from the vernal to the autumnal equinox), than winter (from the autumnal to the vernal.) This is effected, without any additional mechaniſm, by the cutting of the teeth of the large contrate wheel of 269, in ſuch a manner, that there is a gradual increaſe in the ſize of each ſucceſſive tooth through one ſemicircle, and a correſponding decreaſe in thoſe of the other, ſo that there are $5\frac{3}{4}$ths more teeth in one ſemicircle of the wheel than in the other, and conſequently a proportionate number of days motion of the earth, counted on the ſolar dial-plate, during its continuance in the aphelion or ſummer ſemicircle of its orbit; than in its perihelion or winter ſemicircle of its orbit. See EQUATION.

Again, as the cauſe of the variation of the ſeaſons is generally explained ſeparately from the cauſe of alternate days and nights, a contrivance is requiſite to detach the diurnal from the annual motion of the earth, for otherwiſe the ſlowneſs of the annual motion would be unfavourable to an explanation of the phenomena which depend upon the parallelism only; for this reaſon the firſt pinion 10, on the horizontal arbor under the annual bar, which is pivoted into the concealed cock and under the arm, over the teeth of wheel 269, is capable of being detached at pleaſure from the large wheel, by turning the tapped and milled nut S above the annual bar, which draws up the ſquared bearing piece of the cock, into a ſquare ſocket faſtened to the annual bar, and along with it the end of the arbor, ſufficiently high for the pinion to clear the wheel; by which elevation all the motions which depend upon the great wheel of 269 are allowed to ſtop.

Having now detailed the particulars of the tellurian portion of the inſtrument, the lunarian portion demands our attention. Let it, however, be premiſed, that to conſtitute a perfect inſtrument, the motions of all the different parts of the mechaniſm, however accurately calculated, ingeniouſly arranged, and exactly proportioned, with a view both to comparative dimenſions and ſtrength, muſt commence as nearly as poſſible at the ſame time; otherwiſe the indications on the different graduated faces and circles will not exactly correſpond with one another: for inſtance, we have ſeen the moon, in ſome inſtruments of great value, or rather we ſhould ſay of great price, not commencing its motion round the earth, on turning the handle, until the earth has made upwards of a complete rotation on its axis. Such effect was therefore to be guarded againſt, by taking the communication of motion for the moon, not from a ſlowly moving annual

nual wheel, as is uſually done, but from the ſame wheel from which the earth derives its motion, which firſt moving wheel ought to be nearly equally diſtant from all the laſt moving wheels in the inſtrument, in order that the reſulting incipient motions may be *contemporary;* to effect this deſirable purpoſe, the wheel of 94, belonging to the earth's train, is cut both at the edge, and alſo as a contrate wheel, to be driven by the unſeen wheel of 18, placed on the arbor of the handle T, and revolving in 24 hours, for the ſame reaſon that the other wheel of 18 on the long tube revolves in this time; by this ſituation of the handle, all the different trains are coupled together, and begin to move at the ſame inſtant; and what appears to be moreover an advantage, the lecturer may very conveniently turn the handle for himſelf, whilſt he accompanies the earth in its annual circuit, and reads the diviſions on the different faces. The horary circle, U, contains alſo the ſeven days of the week, indicated by a ſecond hand revolving in $\frac{18}{18} \times \frac{56}{8}$ of a day, which is an exact week.

The train of wheels for producing the moon's ſynodic revolution, or monthly motion, being connected alike with the annual and diurnal ends of the earth's train, on account of having its motion communicated from the middle of the earth's train, may be differently denominated, and may have its value aſcertained, either as the improper fraction of a day, or as the proper fraction of a year, it being ſo peculiarly circumſtanced, for the ſake of gaining *immediate* motion, as to take in either half of the earth's train, as a conſtituent portion of its own, whereby there becomes a ſaving in the number of wheels, without a diminution of accuracy in the value of the train: for if we begin to calculate from the large wheel of 269, and conſider it as conſtituting the firſt wheel of the lunar train, we ſhall have $\frac{10}{269} \times \frac{43}{13} \times \frac{48}{73}$ of $365.^{d}242 = 29^{d}\ 12^{h}\ 44^{m}\ 3^{s}.28765$; but if we begin at the earth's axis with the wheel of 18, we ſhall have $\frac{94}{18} \times \frac{26}{10} \times \frac{43}{13} \times \frac{48}{73}$ of a day $= 29^{d}\ 12^{h}\ 44^{m}\ 3^{s}.28765$, as before, four extra wheels being all that we have occaſion to introduce, in addition to the earth's train, to effect a degree of accuracy in the ſynodic revolution, which far exceeds any thing that has been done before, in this or any other country, with the ſame number of wheels; the error being little more than a quarter of a ſecond in an entire month.

The arrangement is thus: on the long arbor under the annual bar, and nearly at the remote end, is fixed a driving pinion or ſmall wheel of 13 to actuate the contrate wheel of 43 reſting on the cock V, ſhewn a little below its true place, on the perpendicular arbor of which wheel is alſo pinned faſt the wheel under the cock W, of 73, which wheel drives the tubed wheel of 48 round in the time already ſpecified; the tube of the wheel of 48 revolves round the fixed tube of the bridge H, and ſuſtains on its upper end the braſs bar X X, which carries the moon round the earth, and ſupports the mechaniſm belonging to her: this monthly bar may be adjuſted to any ſituation by the clamping piece ſeen near the handle T. The moon's latitude is not regulated by an inclined plate, commonly called the nodes' plate, which, for a globe of nine inches diameter, would have been too large and heavy for the wheelwork; but by a forked lever of ſteel, on which the moon's ſtem reſts, that is raiſed and lowered alternately during the period with reſpect to the nodes; this motion is derived from the lunation thus; a lunation is to an anomaliſtic revolution of the moon, as 777 are to 716, very nearly, which numbers are capable of forming the train $\frac{16}{74} \times \frac{179}{42}$ of a lunation, which will be a period of $27^{d}\ 5^{h}\ 5^{m}\ 36^{s}.9$, in which the error is $+ 1.''3$ only. The action of this train is thus; the wheel 74 is fixed faſt on the tube of bridge H, and has therefore no motion, while the monthly arm, X X, is carried round it; the pinion 16 lies on the upper face of this arm, inſerted faſt on the upper pivot of a vertical arbor, the lower end of which reſts on the two-fold cock, ſeen above U, but which, together with the ſaid pinion, is nearly concealed by plate N lying over them; on the under ſide of the monthly arm, and on the ſame vertical arbor, completely concealed, is the ſmall wheel 42 driving the contrate wheel 179, on the horizontal arbor, that lies parallel to, and under the arm: the rim of this contrate wheel is wide enough to admit of the diviſions for ſhewing the moon's latitude, by the edge of the arm uſed as an index, and its poſterior face has an excentric plate, reſembling a circle flattened on one ſide, and ſurrounded by an edge-bar of the ſame ſhape, which edge-bar taking the fork of the ſteel lever Y, gives it the alternate motion which raiſes and lowers the moon's ſtem. A ſcrew in the cock Z, under the arm, preſſes againſt the horizontal arbor of wheel 179, and allows its teeth to come out of action when ſcrewed back, ſo that the graduated rim may be brought to adjuſtment for latitude, in any ſituation of the arm, and ſcrewing in puts the teeth again into action. The moon's argument of latitude, or diſtance from the node, is alſo marked on the rim of 179; and the fulcrum of the lever is at one-third of its length from the forked end, in the cock Z.

Laſtly, the mechaniſm for the moon's anomaliſtic revolution, or the time in which ſhe performs all her variations of diſtance from the earth, and on which her grand equation depends, remains yet to be explained. By a peculiarity in the conſtruction of this inſtrument, there is not an anomaliſtic plate, deriving its motion from an annual wheel, and indicating when the moon *ought* to approach to and recede from the earth, as is uſual in inſtruments where the anomaliſtic mechaniſm is introduced; but the *moon herſelf* actually moves *in an excentric orbit*, in the proper anomaliſtic period, and at the ſame time preſerves the due inclination of her orbit, which two requiſites have perhaps never before been combined by any mechanical contrivance.

The motion is derived from the ſynodic revolution thus; a wheel of 64 is fixed faſt on the top of the tube of bridge H, round which the moon's arm revolves, whilſt the wheel of 67 has a connection with the teeth of 64; the conſequence is, that the wheel of 67 is made to revolve, and with it the wheel of 46, which is attached to it; this laſt wheel ought to drive the wheel of 41, which is the laſt in the train, and which carries the moon alternately nearer to and farther from the earth, by means of a cranked ſtem, but they are neceſſarily too diſtant to act together, where the earth is on ſo large a ſcale as nine inches, the communication is therefore made by an horizontal arbor, which has a pinion at each end of ſimilar numbers, which conſtruction requires the wheels 46 and 41 to be both of them contrate; the effective train, therefore, is $\frac{67}{64} \times \frac{41}{46} = \frac{2747}{2944}$ of 29.5306 days, or the lunation of the wheelwork $= 27^{d}\ 13^{h}\ 18^{m}\ 32^{s}$, during which period the deviation from the truth amounts to only $1.''9499$ of time.

The ſtem, *a*, of the crank, *a b c d*, is ſquare, and paſſes through the ſocket of wheel 41, which is round without and ſquare within, and pivoted into the cock *e*, and lunar arm

X. This ſtem riſes and falls, as has been deſcribed, and carries the moon, reſting on the crank, along with it: this alternate riſing and falling of the moon in every revolution, with reſpect to the nodes, at the ſame time that ſhe departs from or approaches to the earth, once in every anomaliſtic revolution, by the motion of the crank, produces an orbit as nearly as may be like the real orbit of the moon, not only with reſpect to ſhape and poſition, but to acceleration and retardation alſo; for if the bend of the crank, meaſured from the ſtem to the moon's ſtem, be made to bear the ſame proportion to the mean diſtance of the moon from the earth, that *twice* the excentricity of the lunar orbit does to its radius, then the crank piece, *b*, will repreſent the whole equation of the centre, and will be alternately additive and ſubtractive, as in nature. Taking *twice* the excentricity, it muſt be granted, will render the lunar orbit too excentric for its diſtance from the earth, but when it is conſidered that the earth and moon are conſtructed on a large ſcale, the *diſtances* with reſpect to each other, and alſo with reſpect to the ſun, cannot poſſibly be preſerved, without making the annual bar immenſely long, therefore the objection on this ſcore vaniſhes.

Over the cock, *e*, is fixed a circular face to indicate the moon's diſtances and equations dependent upon them, by the help of the revolving hand *f*, which is placed on the upper extremity of the arbor of wheel 41, and which revolves in an anomaliſtic revolution, without riſing and falling with the ſtem of the crank.

The hand *i*, carried by the lunar arm, indicates the moon's age, meridian paſſage, tides, &c. on the fixed plate N.

From this account in detail of all the ſeparate parts of the inſtrument in queſtion, and of their application, it is preſumed that any artiſt, accuſtomed to wheelwork, may, without difficulty, proceed in the conſtruction, particularly as the order, in which the parts are deſcribed, is alſo the order in which they muſt be made and put together. The dimenſions have been purpoſely avoided, leſt a confuſion ſhould take place in the deſcription; and that they may be more conveniently referred to, a table of them is annexed to the end of this account, for the uſe of the workman.

It would enlarge our account too much, to introduce in this place particular directions for dividing the circles on the various faces of the plates; and would imply, beſides, a knowledge of the application of aſtronomical tables in the reader, in which few, comparatively ſpeaking, are converſant. We ſhall, therefore, paſs over the neceſſary directions in this place, as being worthy of a ſeparate notice, and as requiring appropriate drawings. It falls, however, within the province of the preſent account to ſay a few words reſpecting the method of dividing the quadruple ſpiral, in ſuch a way that each line may contain $365\frac{1}{4}$ ſpaces, in order to take in the 29th of February every fourth year. To effect this condition, the ſpiral muſt begin at noon of the 1ſt day of March, civil time, and end on the laſt of February; and alſo the day ſpaces muſt be proportioned to the velocity of the earth's motion in its annual circuit, which, we have ſeen, is either increaſing or decreaſing in every part of the circle round the ſun, in conſequence of the unequal teeth of the large wheel of 269. Here the ſkilful mathematician and the unlettered artiſt would probably find themſelves equally at a loſs how to ſet about a buſineſs apparently ſo complex. The ſpiral, however, being once drawn, which requires but little mathematical knowledge, (and ſtill leſs practice in mechanics, provided a beam-compaſs be at hand,) the buſineſs is perfectly ſimple and eaſy; for the inſtrument *will divide its own ſpaces* in the beſt poſſible manner: becauſe, as there are 365.242 turns of the handle for one revolution of the annual bar, all that is neceſſary, after having adjuſted a ſtraight edge to the index end of the annual bar, is, firſt, to turn the handle, and then make a dividing mark on the firſt ſpiral; then another turn, and another mark, ſucceſſively, until four years are gone through; care being taken to mark, by a long line, each 5, 10, 15, &c. of each month; and that the aphelion point of the large wheel, when the pinion is acting with it, be diametrically oppoſite to the degree in the ecliptic, where the ſun's apogee is, which at preſent is at $9\frac{1}{2}^{\circ}$ of Cancer.

Hence the inſtrument itſelf is the beſt poſſible machine for dividing the day ſpaces, both for expedition and accuracy; for, beſides the quickneſs with which the operation may be performed, if there ſhould happen to be a large or a ſmall tooth in the large wheel, from any cauſe, which tooth would accelerate or retard the annual motion, this mode of dividing will always *accommodate* the day ſpaces to the ſize of the teeth oppoſite them, without the intention, or even knowledge, of the perſon who divides; and as the ſame wheelwork muſt indicate which divided, there is the greateſt probability of the day ſpaces completely anſwering their intention, which could not be ſo well expected from any other mode of diviſion. An inſtrument made from this plan, well executed in its parts, and properly adjuſted, will work the various problems, adapted for the terreſtrial globe, by the mere turning of the handle, and that in the moſt natural way. The globe will be in reality what the new mounted globe only profeſſes to be; and, what is of no ſmall advantage to the learner, the *reaſon* will appear for drawing all the imaginary circles, which are uſually drawn on the ſurface of the globe, and which are generally taken for granted to be neceſſary, without a reaſon being aſſigned. In ſhort, the inſtrument will combine all the uſes of the terreſtrial globe, the tellurian, the lunarian, and the eclipſarian; and its operations will extend not only to explain and illuſtrate, but to calculate and foretell, without any limit of years to come, phenomena which require both great ſkill and perſeverance to predict by the help of aſtronomical tables. Laſtly, to the above-deſcribed inſtrument an apparatus is added, to illuſtrate the tides; and the ſun, or, inſtead thereof, an Argand's lamp, with a darkening cover, and convex glaſs, to make the rays of light fall parallel on the globe, is placed on the annual bar, and turns round the common centre of gravity between it and the earth. Likewiſe, a ſmall lamp is occaſionally carried by a lever attached to the moon's ſtem, at the inner end of which lever a lens is adjuſted, which throws a central lunar ray on the ſurface of the earth, as the ſun's lens does the ſolar light; by means of which luminous points travelling over the revolving globe, not only ſolar and lunar eclipſes, and the countries to which they are viſible, may be eaſily explained, but the riſing, ſetting, and culminating of either body will appear with the correſponding times on the reſpective graduated circles, for altitudes, azimuths, and amplitudes: in ſhort, all the phenomena, ariſing out of the contemporary motions of the earth and moon, will be exhibited by this machine as they happen in nature, particularly when ſmall pullies, for keeping the moon's lamp pointing properly to the earth, are duly applied during the revolution of the crank.

*Table of Dimenſions.*

| | Feet. | Inches. |
|---|---|---|
| Diameter of the ſtand or table - - | 2 | 6 |
| Diſtance from the ſun to the earth - - | 1 | 8 |
| Diſtance from the earth to the moon - | 0 | 8 |
| From the table to the centre of the earth - | 1 | 0 |

Diameter

| | Feet. | Inches. |
|---|---|---|
| Diameter of the globe - - - | 0 | 9 |
| Small ecliptic plate - - - - | 0 | 9 |
| Fixed plate of moon's age - - - | 0 | 10½ |
| Bridge G long - - - - - - | 0 | 5¼ |
| Bridge H - - - - - - | 0 | 4 |

The dimenſions of ſmaller parts as in the plan.

Dimenſions of the Wheelwork.

| | Wheels. | Diameter to the Pitch Line in Inches. | Teeth per Inch. |
|---|---|---|---|
| Earth. | 269 | 12 | 7.1 |
| | 10 | 0.45 | 7.1 |
| | 26 | 1.2 | 8 |
| | 10 | 0.385 | 8 |
| | 94 | 3.7 | 8 |
| | 18 | 0.71 | 8 |
| Lunation. | 13 | 0.6 | 7 |
| | 43 | 1.96 | 7 |
| | 73 | 3.33 | 7 |
| | 48 | 2.18 | 7 |
| Nodes. | 74 | 2.05 | 11.5 |
| | 16 | 0.44 | 11.5 |
| | 42 | 0.67 | 20 |
| | 179 | 2.86 | 20 |
| Apogee. | 64 | 2.05 | 10 |
| | 67 | 2.14 | 10 |
| | 46 | 1.46 | 10 |
| | 41 | 1.30 | 10 |
| Dial work for handle. | 18 | 0.71 | 8 |
| | 18 | 0.71 | 8 |
| | 8 | 0.2 | 15 |
| | 56 | 1.22 | 15 |

The pinions on the long arbors, as are alſo the wheels of 62, are optional.

*The improved Orrery for mean Motions, contrived by the Rev. W. Pearſon.*—We have already ſaid that a *grand orrery* is a machine which repreſents by wheelwork the motions of all the primary planets, and alſo of the moon and Jupiter's ſatellites, together with the diurnal motion, in combination with the annual motion of the earth: in fact, it unites the ſeveral properties of a tellurian lunarium, planetarium, and Jovian inſtrument in one machine, and is the moſt comprehenſive piece of mechaniſm, for explaining the ſolar ſyſtem, that has yet been invented, inaſmuch as that it exhibits each planetary body moving in its own orbit, while the whole ſyſtem is in motion together. After our author had ſucceeded in conſtructing a ſuperb orrery, for equated motions in three parts, from the moſt elaborate calculations, and on a ſcale of magnitude that is admirably ſuited for explaining different portions of the ſyſtem in diſtinct lectures, or leſſons, the firſt of which portions we have already deſcribed; he conceived a plan of uniting all the different detached portions into one machine, on a ſmaller ſcale indeed, but retaining all the eſſential motions, without the equations, that he had before repreſented in ſeparate portions with the equations, which combination of all the mean motions had never before been effected, even with tolerable accuracy, notwithſtanding the great expenſe that had been incurred in the conſtruction of huge machines, that profeſſed much more than they could perform, and that had brought the utility of planetary mechaniſm into diſrepute. The orrery we are now going to deſcribe, was not only calculated and planned by Mr. Pearſon, but completely conſtructed by Fidler under his direction, and from his plans and ſections, in the ſhort ſpace of two months, during the paſt ſpring (1813), and is found to anſwer the expectation of its contriver in its fulleſt extent. The outline of the plan was, to reject all unneceſſary expenſe ariſing out of bulk or complexity of conſtruction, but yet to retain all the variety of mean motions, that a full illuſtration of the ſyſtem demands in a lecture room; hence portability, ſimplicity, accuracy, ſtrength, and neatneſs, are the characteriſtic features of the machine; and conſidering the great variety of problems that may be ſolved by it in the moſt natural manner, by the aid of an equation table, the expenſe is by no means conſiderable. The purchaſe comes within the reach of every reſpectable maſter of an academy, which was the object the author had in view; and as he has himſelf ſet the example, in an eſtabliſhment of the firſt conſequence, it is preſumed that a minute detail of his labours may tend to benefit the riſing generation. It would have carried the inventor beyond the limits of his plan, if he had atempted to exhibit any other than *mean* motions, except in the caſe of the moon, whoſe exact place in the heavens is an object of importance in navigation, as well as in the explanation of eclipſes: neither would it have been conſiſtent with his views, to have aimed at *extreme* accuracy in all the periods, (particularly of the four newly diſcovered planets, which may want further correction in the lapſe of a few years,) but to unite ſimplicity with ſuch a degree of accuracy, that, while the motions are uniformly ſmooth and ſteady, no ſenſible error may ariſe in any of the periods for a century forwards or back: indeed, more than half the periods, particularly the moſt intereſting, are, notwithſtanding, rendered nearly as accurate as the periods collected from the aſtronomical tables themſelves, as will be ſeen in the ſubjoined table of errors. In order to convey to the reader a clear inſight into the different contrivances of this orrery, as well as to give him an idea of its external appearance, we have given two plates of it, VII. and VIII. of *Planetary Machines;* one explaining the internal ſtructure of the acting parts in combination, as well as explicative of the parts that act out of the caſe; and the other repreſenting a perſpective view of its external aſpect. The box A A B B, which contains the different trains of wheelwork, is cylindrical, 12 inches in diameter and three deep, ſupported by a pillar and three claw feet, ſeen in *Plate* VII., all of braſs neatly laquered; the frame C C, in *Plate* VIII., which contains the trains, is ſcrewed into this box, through four little pillars, two of which are ſeen at C and C, and may be taken out at pleaſure, after the circular cover is removed, which is alſo kept down by ſcrews; but the radii vectores, or arms of the planets, muſt firſt be taken off, with the appendages hereafter to be deſcribed. When the frame is taken out of the cylindrical box, and held in an horizontal poſition level with the eye, its ſection will appear as repreſented in the lower part of *Plate* VII., except that ſome of the wheels connected with the earth's train are diſplayed in *figs.* 2 and 3, for the purpoſe of being brought into view. The wheels are laid down in their due proportions, and of half their dimenſions, ſo that they may be copied without difficulty by any ordinary inſtrument-maker, who may be diſpoſed to adopt the conſtruction, and who, like Fidler, poſſeſſes the means of having the requiſite number of teeth cut in each of the wheels. It may not be improper to mention here, that this part of the work can be done by Fayrer, of Red-Lion ſtreet, Pentonville, in the beſt manner, by the famous

famous engine which we deſcribed, (ſee CUTTING-*Engine*,) as the invention of the late Rehé, and alſo that the expenſe of having all the wheels ſo cut is not very conſiderable. We will begin our detail at the diurnal handle near A, which is inſerted into a hole in the ſide of the braſs box, and takes the ſquared end of the horizontal arbor, which revolves in an exact ſolar day, and is pivoted into the double cock H; on the interior end of this arbor is fixed a bevel wheel of 24 teeth, driving another ſimilar wheel of 24 fixed above it, on the ſuperior end of the vertical arbor F, under the dotted cock C, which vertical arbor, therefore, revolves alſo in a ſolar day: on the lower end of this diurnal and vertical arbor is a pinion of 15, let down through a hole made in the plate C C, till the lower end of the arbor reſts on a little cock ſeen ſcrewed to the under ſide of the ſaid plate: this plate, C C, carries the annual train underneath it, and the reſt of the wheelwork above it; the pinion of 15, above referred to, drives the wheel 120, to which is fixed a pinion of 23, ſeen the loweſt, and driving the wheel 61, to which wheel is again made faſt, above it, the pinion 14, to drive the larger or annual wheel 241 round in a ſolar year, which it does with great accuracy, the whole train $\frac{120}{15} \times \frac{61}{23} \times \frac{241}{14} = \frac{58804}{161}$, being equivalent to the period $365^{d}\,5^{h}\,48^{m}\,49.^{s}192128$.

This train is repreſented as having the arbors in a ſtraight line, in order that their connection may be ſeen and underſtood, but in reality they are placed round the centre of the box, and occupy 240 of a circle, as may be ſeen in the calliper laid down in *fig.* 3. of *Plate* VIII., which we have inſerted for the uſe of the inſtrument-maker, who might not otherwiſe underſtand the proper poſition for theſe wheels. The wheel of 120, under the plate C C, is faſt to an arbor that turns between the dotted cock M, and the upper face of the plate, but projects through it to receive the wheel 120 and its pinion 23 below, to which they are pinned on a common tube; and the period in which this arbor revolves is eight days, namely, $\frac{120}{15}$: above the plate, and on this ſame arbor of eight days, is a wheel of 80, as ſeen in the detached *fig.* 2, (taken from the front of the centre of the box,) driving the wheel 70 in ſeven days; the arbor of this laſt wheel is pivoted into the plate C C, below, and into a cock not ſeen above, and its projecting end carries the weekly hand above the cover of the box; in like manner the projecting arbor F, which we have called the diurnal arbor, carries the hour index, both which are ſeen in the perſpective drawing in *Plate* VIII. The wheel 61, already noticed as one of the annual train, has its teeth connected with another pinion of 23, hid under the plate, but ſeen ſideways in the detached *fig.* 3, which gives motion to a third pinion, of the ſame number of teeth, placed on the vertical arbor, working in the dotted cock, which arbor, therefore, turns alſo in eight days, like the firſt pinion of 23; on this vertical arbor is a bevel wheel of 32, ſeen clearly in *fig.* 3, turning another of ſimilar ſhape on the horizontal arbor with 28 teeth, which arbor, therefore, alſo turns in ſeven days, and anſwers to the index on the cover of the box, already called the week-hand. The uſe of this ſecond horizontal arbor, or arbor of a week, which is repreſented as ſhortened, and without it's cocks, is to receive the ſame handle whenever a quick motion is required to be given to the planets, after the diurnal motion of the earth is ſtayed, which is effected thus; the wheel of 61, under the plate C C, is not ſupported by this plate immediately, but turns on a pin or ſtud inſerted into a long bar of braſs L L, ſeen endwiſe in *fig.* 1. but lengthwiſe in *fig.* 3, which turns on a ſcrew under the plate near the centre of the annual wheel, juſt enough to detach the teeth of this wheel from the pinion of 23 on the arbor of wheel 120 (*figs.* 1 and 2.) when required: as the centre of motion of this bar, L L, is near the centre of the large annual wheel 241, the pinion of 14, on the ſame arbor with wheel 61, does not quit its connection with the ſaid annual wheel, but revolves a little way round it with their teeth in action, while the bar in queſtion is moved ſufficiently to detach wheel 61 as before ſtated: at the outward end of the ſaid bar, L L, is fixed the dotted cock of *fig.* 3, and alſo the unſeen cocks of the horizontal arbor for the weekly handle; theſe therefore, together with the bar, will move to the right and left the ſpace of about a quarter of an inch, taken at the exterior end of the arbor. By this contrivance the wheel 61 can be made to have a connection with both the diurnal and annual motions, or only with the latter, as occaſion may require; but when the diurnal motion is required, the handle will not enter the ſecond hole in the ſide of the box to take the weekly arbor, now turned aſide a little, which handle in that caſe is not wanted. The moveable bar, L L, has a hole tapped in its lower face, and a ſcrew with a milled head aſcends through the bottom of the box, in which it has a little play, to allow for the motion of the bar, which bar it then fixes underneath the box, in either the attached or detached ſituation of wheel 61. The utility of this contrivance will appear more clearly hereafter. The third arbor that appears above the box is the annual arbor of wheel 241, which carries the third or yearly hand; and the calliper is ſo contrived, that the three arbors for the hands form an equilateral triangle round the centre of the box, for the ſake of uniformity of appearance. In the centre of the plate, C C, is ſcrewed faſt a rod of ſteel, D D, perfectly perpendicular, upwards of nine inches long, and ſomewhat more than a quarter of an inch in diameter, into the top of which the ſun's ſtem is ſcrewed, and round which thirteen concentric tubes are placed, twelve of which revolve within one another; and the bore of the laſt is an inch and a quarter. From the top of the outermoſt to the top of the innermoſt tube is a length of five inches and three quarters, conſtituting twelve ſteps up the fruſtum of a cone, as ſeen in *Plate* VII.; theſe tubes have each a wheel fixed to its lower end, which wheels make them revolve, together with their attached arms and appendages, in their reſpective periods. We come now to deſcribe how theſe tubes have their motions communicated to them and their periods regulated.

The arbor, E E, of the annual wheel 241 revolves once in a ſolar year between the large plate C C, and the dotted bridge K, not entirely ſeen, which keeps it perpendicular: on this arbor are borne fifteen wheels and pinions, of which the four uppermoſt and the four undermoſt, ſhewn in ſection, revolve looſely in pairs pinned together reſpectively, and the ſeven intermediate ones, repreſented with teeth, are made faſt to one another, and alſo to the arbor, and conſequently revolve together in the ſpace of a ſolar or tropical year. In this conſtruction ſeven of the planets have their revolutions produced by each one pair of wheels, the numbers of ſix of which conſtitute ſo many improper fractions of a year, thoſe for the earth having like numbers to expreſs unity, or one year; but the two inferior and two remoteſt planets have each a train of four wheels, for the ſake of greater accuracy in the periods, than ſimple pairs are capable of producing in a practical form; to theſe the annual arbor performs the office of an upright ſtud, or long pin, round which they may revolve, each pair in a ſeparate ſtate, as their reſpective coadjutors direct; ſo that the conſtruction is of a mixed nature, conſiſting partly of ſimple ratios, or pairs of wheels,

like that of the common planetarium, and partly of trains derived from compound fractions; and retains much of the ſimplicity of the cheapeſt inſtruments, while it poſſeſſes the accuracy of the moſt expenſive. We might have begun with the longeſt tube, or loweſt wheels, and have proceeded in the order of their ſucceſſion, till we had explained the whole of the motions as they occur, but that the two interior planets derive their motions through the medium of each other, firſt from the Earth to Venus, and then from Venus to Mercury; ſo that we muſt neceſſarily begin from the motion of the earth, which takes that of the annual arbor unaltered, its wheels, one faſt on the arbor, and the other on the tube, being each 85, by which is meant having each 85 teeth, and the period we have ſeen is $365^d\ 5^h\ 48^m\ 49^s$, very nearly. Under the wheel 85 on the earth's tube, but above the bridge, S, with the fixed tube, is ſcrewed faſt a wheel of 113, driving its fellow of 63 round the annual arbor, to which is made faſt another driver of 58, which actuates a wheel of 64, made faſt to the tube of Venus under the bridge, the value of which train is $\frac{63}{113} \times \frac{64}{58}$ of a ſolar year, or $224^d\ 16^h\ 41^m\ 53^s$; again to this laſt wheel on Venus' tube is made faſt the wheel 78 of Mercury's train, which impels its fellow 97 round the annual bar, below the looſe pair of Venus, and has a wheel of 108 faſt to it, which again drives the wheel 34 on Mercury's tube in $\frac{97}{78} \times \frac{34}{108}$ of Venus's period, or in $87^d\ 23^h\ 14^m\ 37^s$. It is of importance that the periods of theſe two planets be correct, becauſe an error in either of them would accumulate in the inverſe ratio of the length of thoſe periods, which, being both comparatively ſhort, would ſoon render the error ſenſible by ſuch accumulation. The motion of the diurnal arbor comes next above the annual wheel of 85, in order to be tranſmitted along the annual bar to the axis of the earth, carried at its remote end; but this motion is modified in a way that will be explained by and by: it is thus communicated; a wheel of 50 is made faſt to the vertical diurnal arbor, that impels another of 100 fixed on the tube that next ſurrounds the annual tube already deſcribed: this latter wheel of 100, with its tube, therefore revolves in the ſpace of two days, which is all the notice we ſhall take of it at preſent: above this comes the pair of wheels for the revolution of Mars, *viz.* $\frac{79}{42}$, the 42 faſt on the annual arbor, and the 79 attached to the tube, the value of which ſimple fraction of a year is $687^d\ 0^h\ 4^m\ 38^s$.

Next to the tube of Mars comes that of Veſta, with 29 faſt on the arbor driving 106 on the tube in $1335^d\ 0^h\ 33^m\ 32^s$; after that 31 on the arbor drives 135 with the tube of Juno round in $1590^d\ 13^h\ 37^m\ 32^s$; and over theſe wheels a common pair, $\frac{138}{30}$, carry both Pallas and Ceres round in $1680^d\ 2^h\ 44^m\ 27^s$, by means of the 30, attached to the revolving arbor, impelling the 138 attached to their common tube. The pair of wheels which ſucceed the new planets before Jupiter's wheels come, are $\frac{55}{70}$, the 70 fixed on the vertical arbor of ſeven days, ſeen detached in *fig.* 2, and the 55 driven by it made faſt to the tube, which by theſe means revolves in $5\frac{1}{2}$ days for the purpoſe of communicating motion to Jupiter's moons, in the manner we ſhall preſently deſcribe.

Above this tube of $5\frac{1}{2}$ days revolves Jupiter's in $\frac{166}{14}$ of a year, or in $4330^d\ 17^h\ 30^m\ 1^s$, the 14 on the annual arbor giving motion to 166 with the tube upon it, and this is the laſt of the ſeven ſimple pairs.

The motion of Saturn is derived from Jupiter's period in this manner, like that of Venus from the Earth; the wheel of 53 is attached to Jupiter's 166, and revolves with it, driving 50 round the annual arbor looſely, while 46 is pinned to it, which in its turn drives the wheel 121 made faſt to Saturn's tube in the period of $10746^d\ 21^h\ 18^m\ 25^s$, or $\frac{50}{53} \times \frac{121}{46}$ of Jupiter's; and laſtly, the train of Georgian takes its motion from the tube of Saturn in a ſimilar manner; the wheel 86 is fixed on the tubed wheel 121 of Saturn, and actuates the wheels 46 and 28 pinned together round the arbor, uſed as a ſtem, and the latter of them again urges the wheel 149 on Georgian's tube in $\frac{46}{86} \times \frac{149}{28}$ of Saturn's period, or in $30589^d\ 8^h\ 32^m\ 25^s$.

Thus twenty-eight wheels and pinions are employed to give the revolutions of the eleven primary planets, as taken from the annual arbor, which wheelwork alone would ſuffice to make an accurate planetarium by a ſimilar application, without the other mechaniſm. The wheels for giving the ſun's motion on his axis from Mercury, might have been added to the above deſcribed wheelwork, but it was judged better to omit them for the ſake of ſimplicity and cheapneſs, eſpecially as the motion of the ſolar ſpots, when they happen to occur, is the only phenomenon to be exhibited by ſuch motion, which can eaſily be conceived from turning round the ſtem by which the ſun is ſupported.

We return now to the diurnal motion of the earth and the periods of the ſecondaries, as exhibited in this machine, which form very intereſting portions of the ſyſtem. We have already traced the communication of motion from the diurnal handle to a tube of two days' period, next above the annual tube, but not aſcending ſo high by one ſtep, while that of the bridge aſcends a ſtep above. Though the earth's arm is only $7\frac{1}{2}$ inches long from the centre of the ſun to that of the earth, yet it contains, in miniature, all the apparatus of the earth and moon, ſomewhat differently modified, that we have deſcribed as conſtituting the firſt portion of the orrery in three parts: the variations in the conſtruction demand, notwithſtanding, that we ſhould give, in this place alſo, a detail of the numbers employed, and the mode of their application, to produce a like effect by mechaniſm more portable. It will not, however, be neceſſary to dwell ſo minutely on the uſes of the different parts, as it would have been, if this arm had been deſcribed before the other inſtrument. The earth's annual arm, denoted by the letters *a b*, is a flat bar of braſs, made firm by an edge-bar fixed above it, and having a croſs-piece, *c d*, at its remote end, (ſeen in *fig.* 4. and partially in *Plate* VIII.) extending $1\frac{3}{4}$ from its centre one way, and $2\frac{3}{4}$ the other, to carry ſome of the wheels and other appendages, that Mars may avoid them in his orbit as the earth paſſes him: a ſlit tube, with a ſurrounding clamping piece and ſcrew, is attached to the upper face of the bar, by means of which it is ſecured to the upper end of the tube of the annual wheel 85, by which it is carried round in a ſolar year; but along with this arm, and immediately under it, a contrate wheel of 96, with its teeth pointing downwards, and having a ſimilar ſhort ſlit tube and clamping piece, is puſhed upon the end of the tube of two days' period, to which it is clamped

clamped faſt, while its teeth are in connection with thoſe of a pinion of 8 under the ſaid arm; but great care is neceſſary, before the final clampings, that the pinion's teeth be put at a proper acting depth into thoſe of the wheel: this pinion has an arbor extending the whole length nearly of the arm, and parallel to it, but is carried by two cocks beneath it, in a way ſimilar to the horizontal arbor ſeen above the arm: the remote end of this lower horizontal arbor has a ſimilar pinion attached to it, which drives another wheel of 48 teeth, alſo contrate, but with its teeth pointing upwards to alter the direction of motion; the time of a revolution of this latter wheel is, therefore, one day, or half the time of a revolution of 96 that revolves in two days: the diurnal wheel of 48, juſt deſcribed, has a ſolid arbor, ſupported by a bridge under the croſs-piece of the arm at its lower pivot, and by the annual arm, which it penetrates at $\frac{5}{8}$ of an inch above: this arbor ſtands in a poſition perpendicular to the arm, and is three inches long, and about $\frac{2}{10}$ in diameter. On the upper end of this arbor is fixed, ſimply by friction, a ſmall wheel of 36, impelling a ſimilar one, a little bevelled, on the earth's axis, which, by this communication of motion, makes the earth revolve in one day when the annual motion of the arm is ſtayed; but when the annual motion is uſed along with the diurnal, the pinion revolves round the contrate wheel of 96, and gives the motion of 96 teeth or two days to the 48, which by this combination of two motions makes $367\frac{1}{4}$ inſtead of $365\frac{1}{4}$ revolutions in the year. A novice in calculations of this nature would pronounce this to be an error of two days in the year, as theſe two days' motion are tranſmitted without alteration to the earth's axis; but the truth is, the effect of this combination was not only foreſeen, but taken into the calculation of the annual train as a compenſation for a deduction of two days' motion, which the earth experiences from a combination, in another place, of an oppoſite nature, but to the ſame amount. The contrivance for keeping the earth's axis parallel to itſelf in all parts of its orbit, which we ſhall ſoon deſcribe, gives the earth a retrograde motion annually, by which one rotation in the year is deducted from thoſe given by the train; and as the two wheels of 36 are connected during this retrograde motion, the one that is fixed on the earth's axis makes a retrograde revolution in the ſame period, by being carried round the other during the lapſe of the year, thereby making a ſecond deduction of a day in the year: theſe two days ſubtracted from the $367\frac{1}{4}$, produced in the way above deſcribed, leave the number of days in a year $365\frac{1}{4}$, as in nature. It is to a want of a compenſation of this ſort that the old orreries and tellurians are moſt of them of little value in the ſolution of problems where time is concerned, as we have already had occaſion to notice. It is but doing juſtice to the ingenuity of Janvier, the French mechanic, to aſcribe to him the contrivance of this ingenious mode of compenſation, which is very convenient when the diurnal handle is in a ſtationary ſituation, remote from the annual bar, as in the machine before us. Indeed, without ſome ſuch contrivance, the diurnal motion of the earth, and alſo of the handle, could not have been perfectly effected. The retrograde annual motion, for keeping the earth's axis parallel always, is derived from the contrate wheel of 62, placed by a clamping piece over the annual bar on the fixed tube of the bridge, with its teeth downwards ſo as to catch the teeth of the pinion of 8 above the edge-bar of the annual arm. The axis of this pinion is, in fact, ſupported at both ends by projections made in the edge-bar itſelf, inſtead of the two cocks; and a ſimilar pinion at its remote end gives motion to another contrate wheel of 62, with its teeth turned up, on account of the backward direction of its motion. The tube of this laſt wheel, ſeen detached in *fig.* 4, ſurrounds the diurnal vertical arbor, and ſupports the bearing piece P, in *fig.* 1, on which the earth's axis reſts, which axis will come out of the bearing piece when the pin with a circular head is drawn out of the ſide of the ſocket carried by this bearing piece; for a circular groove turned on the earth's axis, within the ſocket, allows the pin to paſs at one ſide of it along the groove, by which pin it is kept in its place, and is yet at liberty to revolve. The ſmall ecliptic circle O, for eſtimating the geocentric places of the moon and planets, reſts alſo on this annual tube of retrogradation, or of parallelism, by means of which the ſigns marked on it are kept parallel to the larger circle of ſigns ſurrounding the ſun. The lunation is derived from the annual wheel of parallelism, as is alſo the period of the nodes, thus; an annual wheel of 107, beſt ſeen in *fig.* 4, is made faſt to the 62, and, partaking of its motion, drives a pinion of 12, through the medium of a pinion of 15, which only changes the direction of motion, and the arbor of the pinion 15, which is a tube revolving on a ſtud at the end of the croſs-piece *c d*, carries on its upper end the wheel 86, which makes another wheel of 62 revolve, with its tube, in a proper direction, in a period of $\frac{12}{107} \times \frac{62}{86}$ of a year, or in $29^{d}\ 12^{h}\ 44^{m}\ 1.^{s}2$, in which train the error is little more than one ſecond *per* month in defect: in like manner, the train for the period of the nodes is $\frac{24}{62} \times \frac{76}{31}$ of a year, or 18 ſolar years, 23 days, 14 hours, and 49 minutes: 62 is the annual wheel, the 24 and 31 are pinned together, and revolve on a tube round a ſtud on the longer part of the croſs-piece *c d*, and the 76 bears, on the upper end of its tube, the inclined circle, marked *nodes*, graduated for the moon's latitude, on which the moon's ſquared ſtem is ſupported as it moves forward in its orbit. The anomaliſtic revolution of the moon is taken from the lunation, and the train, contained in the monthly ſmall frame, for giving the principal equation and variation of diſtance, is $\frac{67}{64} \times \frac{46}{41}$ of a lunation, or $27^{d}\ 13^{h}\ 18^{m}\ 32^{s}$, as in the larger machine before deſcribed. Before we take leave of the earth's arm, we think it right juſt to mention, that by reaſon of the compenſation in the diurnal motion of the earth, neither ſolar nor ſidereal time can be indicated on the arm itſelf; but we ſhall preſently ſee, that theſe are both indicated by the ſame hand, on two ſeparate faces, upon the cover of the box, where the reading is more convenient to the lecturer, while he turns the diurnal handle. It may be alſo requiſite to mention here, that the equations of the moon's centre are inſerted on the ſmall plate R at the remote end of the monthly frame; and alſo that the fixed rim Q, that has the moon's age marked on it, and which is croſſed out for lightneſs, is placed on the ſtationary tube carried by the cock T, that is ſeen between 62, the contrate wheel of parallelism, and 62, the lunation wheel next above. The furniture of the earth, which is a three-inch globe, is an horizon circle, a meridian circle, both adjuſtable, a quadrant of altitude adapted to the meridian circle, all graduated, an arc of illumination, and a ſolar lens U, for converging the light of the lamp, placed in the ſun's place occaſionally, into a focal point on the ſurface of the globe, which point, being luminous, ſhews the place of a vertical ray at all times, and in all poſitions of the globe, and affords the moſt natural as well as moſt eaſy means of ſolving all the variety of problems in which the ſun is concerned. Immediately under the earth's arm a circular plate, N, is

clamped to the top of the ſtationary tube, on which are engraved a quadruple ſpiral graduated into day ſpaces in ſuch a way, that February has 29 days every fourth year; and within this is an ecliptic circle correſponding to the ſun's *mean* place on the reſpective days of the year, with a graduated circle within that to ſhew the equation of the ſun's centre, by which his mean place is immediately converted into his true or apparent place, by addition or ſubtraction, as the caſe happens to be. The aphelion points of all the planetary orbits are likewiſe marked within the ecliptic, which aſſiſt in computing the mean anomaly of any planet at any time; from which the equation of its centre may alſo be aſcertained and applied by the help of the proper tables calculated for this purpoſe. In the ſame manner, the place of the aſcending node of each planet might be inſerted, from which the heliocentric latitude might be eaſily deduced in problems, where great nicety is required. Indeed, exerciſes of this ſort would render familiar the application of the tables themſelves for finding the places, as given in the Nautical Almanac, and White's Ephemeris, without the aſſiſtance of thoſe helps. The end of the annual arm is prolonged acroſs this circular plate, and receives an index piece, V, in the form of a cock, that carries a ſilken thread ſtretched long enough to reach over all the divided circles, as well as the ſpiral, which thread at once indicates the day of the month in leap year, or any of the three following years, the ſun's mean place in the ecliptic, and the correſponding equation, additive or ſubſtractive, as the caſe may require. To the under face of this plate the contrate wheel of 62 for the earth's parallelism is ſcrewed faſt, and is thus attached to the fixed tube. As it was found convenient to make the earth's diſtance from the ſun ſeven inches and a half, to allow for the introduction of a three-inch terreſtrial globe to be put on, inſtead of the ſmall ivory ball, when problems are to be ſolved by it, this diſtance became the ſtandard by which the other diſtances were to be aſcertained. As far as Mars, incluſive, the proportional diſtances are preſerved; but beyond Mars certain proportional parts were neceſſarily adopted, inſtead of the whole diſtances, which in Saturn would have been 73 inches, and in Georgian 144. The following table contains the ſcale of diſtances which appeared to be, on the whole, moſt deſirable to fix upon for the reſpective lengths of the arms, that revolve with the planetary balls in this machine; and thoſe of Saturn and Georgian are made of tubes that ſlide within one another for the ſake of lightneſs, as well as of packing.

*Table of Diſtances from the Sun.*

| | | |
|---|---|---|
| Mercury | 2.89 inches. | |
| Venus | 5.45 | |
| Earth | 7.5 | |
| Mars | 11.45 | |
| Veſta | 13.4 | *viz.* $\frac{7}{8}$ of 15.3 |
| Juno | 15.9 | $\frac{4}{5}$ of 19.9 |
| Ceres and Pallas | each 16.6 | $\frac{4}{5}$ of 20.7 |
| Jupiter | 19.6 | $\frac{1}{2}$ of 39.2 |
| Saturn | 21.9 | $\frac{3}{10}$ of 73 |
| Georgian | 24.0 | $\frac{1}{6}$ of 144 |

In order that an exact idea may be formed of the real proportional diſtances of Veſta and the planets beyond, as compared with that of the earth, ſix holes are drilled and tapped along the earth's arm, at the ſame proportional diſtances from the ſun, that the ſcale of this table requires, into any one of which holes the ſtem of the ſmall ivory ball may be ſcrewed; from which holes the reſpective planets muſt be ſuppoſed to be viewed, to gain the geocentric places reſpectively. For inſtance, if the geocentric place of Mars be required at any time, firſt allow for the equation of the centre from the table made for this purpoſe, by turning the planetary ball forward or back from its mean place, by a joint made for this purpoſe at the inſertion of the upright wire at the remote end of the arm, the quantity may be eſtimated by the ecliptic circle, which ſtands in a convenient ſituation for referring the places to: this being done, ſtretch a ſilken thread, from the earth's ſtem, ſcrewed into the fourth hole from the ſun in the earth's arm, till it lays over the centre of Mars' ball; then a ſecond thread drawn parallel to this, either from the earth, or from the ſun, as may be moſt convenient, will cut the geocentric place of the planet in the ſmall or large ecliptic circle, whichever be uſed. This uſe of the parallel threads anſwers the ſame purpoſe as placing an ecliptic circle in a parallel ſituation round the hole where the earth's ſtem is inſerted for rendering the two given diſtances exactly proportionable. This contrivance affords the means of working problems connected with the geocentric appearances, as well as if the arms had been all lengthened into due proportion; for when the geocentric places are aſcertained, the upright wires, by being turned on their centres of motion, will bring the planets into the aſcertained geocentric places, without moving the arms of mean motion out of rectification: for Saturn and Georgian, the tubes afford the means of doing this by turning one within another.

We come now to explain the mechaniſm connected with, and carried by, Jupiter's arm, which we have ſeen is 19.6 inches long: it will be recollected that we have traced the tranſmiſſion of motion from the ſeven days' arbor to a tube of $5\frac{1}{2}$ days, revolving next within Jupiter's tube: upon the upper end of this tube of $5\frac{1}{2}$ days, a contrate wheel of 60 is clamped with the teeth pointing down towards Jupiter's arm, with which it comes in contact: this arm is a long tube, and admits an arbor of the ſame length within it, which, conſequently, is not ſeen, except where the arm is diſunited: this long horizontal arbor has a pinion of 8 at each end of it, one of which is impelled by the ſaid wheel of 60, which deſcends through a notch made in the upper ſide of the arm or tube, till it catches the pinion; and the other drives a ſimilar wheel of 60 at the remote end of the tube, where a notch is made under the tube, through which the teeth of the wheel, pointing upwards, catch the teeth of this pinion. Now it is evident, from the ſimilar numbers, that if Jupiter's arm had no motion, this laſt contrate wheel of 60 would revolve in $5\frac{1}{2}$ days, as the other 60 does; but the motion of the arm round the ſun alters this period a little, which alteration muſt be aſcertained, before we explain the mechaniſm of the ſatellites, which derive their motions from this altered period. As the firſt pinion of 8 revolves round the firſt wheel 60 in Jupiter's period, it is made to revolve $\frac{60}{8}$, or $7\frac{1}{2}$ times in this period oftener than it would have done in a fixed poſition. Again, the ſecond pinion of 8, which may be conſidered as the ſame pinion prolonged within the tube, gives its $7\frac{1}{2}$ revolutions to the ſecond wheel of 60, which, therefore, makes juſt one revolution in Jupiter's period more than it would have done without the motion of the arm; the conſequence is, that the time of its revolution is leſs than $5\frac{1}{2}$ days, by a quantity that will amount, by accumulation, to $5\frac{1}{2}$ days in Jupiter's period. This quantity may be thus aſcertained; the period produced by Jupiter's wheels is 4330.72916 days; hence, as $4330.^{d}72916 : 4325.^{d}22916 :: 5.^{d}5 : 5.^{d}493014$; that is, as the whole period is to the period diminiſhed by 5.5 days, ſo is the whole time of the wheels' calculated revolution, to its diminiſhed period of a revolution: and as a proof of the correctneſs of this ſtatement,

ment, if we multiply the whole period of Jupiter by .006986, the difference between the two laſt terms, or the acceleration in each revolution of the wheel, the product will be 5.5 days, or an acceleration of one entire revolution in the ſaid period. Inſtead, therefore, of 5.5 days, we muſt take 5.493014 as the time of revolution of the remote wheel of 60, the arbor of which is made the common arbor of four other wheels, which drive each another wheel, ſoldered to as many tubes reſpectively, to carry the arms of the four ſatellites, as ſeen in the drawings. The wheels, with their reſpective periods correſponding, are contained in the ſubjoined table, where it is to be underſtood that the denominators of each fraction are the drivers made faſt to the arbor of 5.493014 days, and the numerators are the wheels faſt to the tubes reſpectively.

TABLE of Jupiter's Satellites.

| Satel. | Wheels uſed as Fract. | Periods correſponding. | Errors in each Period. |
|---|---|---|---|
| | D. | D. H. M. S. | ′ ″ |
| 1 | $\frac{29}{90}$ of 5.493014 | 1 18 28 45.49 | + 0 9.49 |
| 2 | $\frac{33}{51}$ of ditto | 3 13 18 11.78 | + 0 17.78 |
| 3 | $\frac{60}{46}$ of ditto | 7 3 57 18.8 | — 2 17.2 |
| 4 | $\frac{61}{20}$ of ditto | 16 18 5 19.05 | + 0 12.05 |

The common arbor is held in a vertical poſition by two cocks, one above the end of the tube, and one below, which alſo holds the ſtem of Jupiter, round which the tubes revolve, and likewiſe the croſs piece ſeen in *Plate* VII. which ſupports a paper ſcreen for receiving the ſhadows of the ſatellites when a lamp is uſed; but when a lamp is not uſed, a conical piece of braſs fits on the ſtem behind Jupiter, to repreſent the ſhadow of his body, and to explain the immerſions or emerſions of the ſecondaries as they revolve. The diſtances of the ſatellites are taken in diameters of the ſmall ball that repreſents Jupiter. For a deſcription of other inſtruments, that have been conſtructed to anſwer this purpoſe ſeparately, we beg to refer to our article SATELLITE *Inſtrument*.

We have now arrived at the faces on the cover of the box, and the wheels that guide the indications, which will conclude our deſcription of this machine. On the vertical diurnal arbor that carries one of the bevel wheels at firſt deſcribed, is inſerted an adjuſtable hand that indicates mean ſolar time, on a rim of 24 hours fixed to the cover of the box: this rim is $3\frac{1}{4}$ inches in diameter, and $\frac{3}{8}$ broad; within this rim and in the ſame plane revolves a circular dial of 24 hours in a retrograde direction, juſt once in a ſolar year; and the ſame hand that indicates mean ſolar time on the fixed rim, indicates alſo ſidereal time on the revolving dial with equal accuracy; for as the revolving dial meets the hand the ſpace of $\frac{1}{365.242}$ of a circle ſooner in each ſucceſſive revolution, one day more in a year is indicated on this revolving dial than on the fixed plate, in the way that is done in Margett's chronometer, but with much more accuracy, as the train here between a day and a year is perfect. In order to produce this retrograde motion of the little dial of 24 ſidereal hours, one pinion only was neceſſary, which is fixed at the bottom of a tube that revolves round the diurnal arbor as a ſtud, and carries the dial on its upper extremity. It will be recollected that a pinion of 14, fixed to the annual arbor, drives a large wheel of 166 for the motion of Jupiter: now a ſimilar pinion of 14, placed over the bevel wheels, round the diurnal arbor, which is at the ſame diſtance as the annual arbor from the edge of 166, will act with it in this ſituation alſo, and will revolve in the ſame time that the firſt 14 does, which has been ſhewn to be a ſolar year. The intermediate wheel of 166 only tranſmits the motion unaltered, except as to its direction, which otherwiſe would not have been retrograde: thus from means the moſt ſimple, reſults of the utmoſt importance are derived, both as to utility and accuracy; and, what is not to be overlooked, the indication falls immediately under the eye of the lecturer, who muſt neceſſarily ſtand at the handle of the machine, while he is giving his lecture. The weekly vertical arbor, ſeen detached in *fig.* 2, ſtands at the ſame diſtance from the ſun, or centre of the box, as the other two arbors, and, as has been ſaid, forms with them an equilateral triangle. Another rim, ſimilar to the one juſt deſcribed, is alſo ſcrewed round the top of this arbor to the cover of the box, and contains the ſeven days of the week, which are pointed to by a hand placed in an adjuſtable manner on the projecting arbor, as ſhewn in *Plate* VII. This arbor alſo ſerves inſtead of a ſtud for two concentric tubes, one revolving in the ſolar year, and the other in the period of Jupiter: the former, or inner tube, is every way ſimilar to the one we have juſt explained, namely, a pinion of 14 takes the annual motion through the medium of Jupiter's 166, and carries this tube, to the upper end of which is adjuſted a ſecond hand, that indicates the time of Jupiter's meridian paſſage on any given day, upon an horary circular plate placed on the outer tube, which revolves in the period of Jupiter, and which is juſt large enough to fill the circular ſpace on the cover that was left within the fixed rim for the ſeven days: this motion is produced by means equally ſimple; the firſt wheel of the train that connects Saturn with Jupiter is 53, revolving faſt to the 166, and therefore in Jupiter's period, this wheel happens to occupy very nearly half the diſtance between the centre of the box and the weekly arbor, and therefore admits another wheel of 53 to act with it from this arbor, and this 53 revolving in the ſame direction as the 14 under it, and, in the period of Jupiter, carries on its tube an horary dial, over which the annual hand paſſes in the ſynodic revolution of the earth, as compared with Jupiter. This little dial, if divided into 360°, would have ſhewn the diſtance of Jupiter to the ſun at any time, as ſeen from the earth, but it was thought to be more convenient to ſhew this diſtance in time, which therefore repreſents Jupiter's meridian paſſages when the index is put to XXIV on the day of Jupiter's conjunction with the ſun. In the ſame manner the time of culminating of any other planet might be indicated. Indeed, if an horary circle could conveniently be attached to the earth's arm, round the centre of its motion, under the large graduated circle of days, &c. the planetary arms would be ſo many indexes, though at ſome diſtance above and below it, to point out thereon the reſpective times of culmination of all the primary planets, agreeably to their mean motions. Jupiter's time of ſouthing is, however, a matter of daily importance, as it is a guide to his viſibility or inviſibility at any given hour, when the eclipſes of his ſatellites occur, and alſo ſhews whether the immerſions or emerſions of theſe ſecondaries take place; that is, whether Jupiter is before or behind the ſun, or, in other words, more or leſs than 12 hours from the ſun, as ſeen from the earth. Laſtly, the third rim, fixed to the cover of the box, round the annual arbor, has a circle of the ſun's declination engraven on it, and another circular face made faſt within it, juſt large enough to fill the vacant ſpace, on which face the reduction of the ecliptic to the equator is inſerted: theſe two faces require no additional wheelwork, but are pointed to by one hand adjuſted to the top of the annual arbor, over the

ſtack

ſtack of annual wheels. The reduction of the ecliptic to the equator, like the equation of the ſun's (or earth's) centre, marked within the large ecliptic circle, is given in degrees; and as theſe two cauſes of apparent inequality of the ſun's motion are given ſeparately, their ſum or difference (as the ſigns are the ſame or different) conſtitute the whole equation of time in degrees, which muſt be converted into time, at the rate of four minutes to a degree. Theſe contrivances afford the beſt poſſible means of explaining how the equation table is conſtructed of two different ſets of calculations, founded on diſtinct elements, and then combined into one quantity that comes to zero four times in the year, and that varies every day in a way that is not otherwiſe explicable, but that is thus rendered manifeſt to an ordinary arithmetician.

TABLE of Periods and Errors of the Wheelwork.

| | Period. | | | | Errors in Time. | | | Errors in the Ecliptic. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SOL. Y. | D. | H. | M. | S. | H. | M. | S. | ′ | ″ | ‴ |
| Mercury | — | 87 | 23 | 14 | 37 | + 0 | 0 | 1.8 | 0 | 0 | 18 |
| Venus | — | 224 | 16 | 41 | 53 | + 0 | 0 | 23 | 0 | 1 | 32 |
| Earth | — | 365 | 5 | 48 | 49 | + 0 | 0 | 1 | 0 | 0 | 2.5 |
| Mars | — | 687 | 0 | 4 | 38 | + 1 | 46 | 1 | 2 | 19 | 0 |
| Veſta | — | 1335 | 0 | 33 | 32 | not perfectly determined. | | | | | |
| Juno | — | 1590 | 13 | 37 | 32 | | | | | | |
| Pallas and Ceres | — | 1680 | 2 | 44 | 27 | | | | | | |
| Jupiter | — | 4330 | 17 | 30 | 1 | + 2 | 51 | 31 | 0 | 35 | 36 |
| Saturn | — | 10746 | 21 | 18 | 25 | + 1 | 58 | 25 | 0 | 10 | 0 |
| Georgian | — | 30589 | 8 | 32 | 25 | + 0 | 5 | 26 | 0 | 0 | 6 |
| Moon | — | 29 | 12 | 44 | 1.2 | — 0 | 0 | 1.6 | 0 | 0 | 52 |
| Ditto anomaliſtic | — | 27 | 13 | 18 | 32 | — 0 | 0 | 1.9 | 0 | 1 | 2 |
| Ditto nodes | 18 | 223 | 14 | 49 | 0 | — 4 | 52 | 24 | 0 | 39 | 0 |

Dimenſions of the Wheels and Pinions.

| Planets. | Wheels. | Diameters in Inches. | Teeth *per* Inch. | Planets. | Wheels. | Diameters in Inches. | Teeth *per* Inch. |
|---|---|---|---|---|---|---|---|
| Mercury | 78 | 2.0 | 12 | Earth's paralleliſm | 62 | 2.16 | 9.16 |
| | 97 | 2.5 | 12 | | 62 | 2.16 | 9.16 |
| | 108 | 3.42 | 10 | Diurnal motion | 50 | 1.50 | 9.4 |
| | 34 | 1.08 | 10 | | 100 | 3.00 | 9.4 |
| Venus | 113 | 2.0 | 12 | Ditto on the annual bar | 90 | 3.0 | 9.5 |
| | 63 | 2.5 | 12 | | 45 | 1.5 | 9.5 |
| | 58 | 3.42 | 10 | Weekly motion | 80 | 2.17 | 11.7 |
| | 64 | 1.08 | 10 | | 70 | 1.90 | 11.7 |
| Earth | 85 | 2.25 | 12 | To Jupiter's moons | 70 | 2.51 | 8.75 |
| | 85 | 2.25 | 12 | | 55 | 1.99 | 8.75 |
| Mars | 42 | 1.56 | 8.5 | | 107 | 2.25 | 15 |
| | 79 | 2.94 | 8.5 | | 15 | 0.31 | 15 |
| Veſta | 29 | 0.97 | 9.5 | Lunation | 12 | 0.25 | 15 |
| | 106 | 3.53 | 9.5 | | 86 | 1.81 | 15 |
| Juno | 31 | 0.84 | 11.8 | | 62 | 1.31 | 15 |
| | 135 | 3.66 | 11.8 | | 62 | 2.16 | 9.1 |
| Ceres and Pallas | 30 | 0.8 | 11.8 | Nodes | 24 | 0.84 | 9.1 |
| | 138 | 3.7 | 11.8 | | 31 | 0.87 | 11.3 |
| Jupiter | 14 | 0.35 | 12.6 | | 76 | 2.13 | 11.3 |
| | 166 | 4.15 | 12.6 | | 64 | 1.14 | 17.8 |
| Saturn | 53 | 2.32 | 7.25 | Anomaliſtic revolution | 67 | 1.20 | 17.8 |
| | 50 | 2.18 | 7.25 | | 41 | 0.74 | 17.8 |
| | 46 | 1.24 | 11.8 | | 46 | 0.82 | 17.8 |
| | 121 | 3.26 | 11.8 | Jupiter's arm | 60 | optional. | |
| Georgian | 86 | 2.93 | 9.3 | | 60 | ditto. | |
| | 46 | 1.57 | 9.3 | 1. Satellite | 90 | 1.77 | 16 |
| | 28 | 0.71 | 12.5 | | 29 | 0.58 | 16 |
| | 149 | 3.79 | 12.5 | 2. Ditto | 51 | 1.43 | 11.4 |
| The annual train of the Earth | 15 | 0.41 | 12 | | 33 | 0.92 | 11.4 |
| | 120 | 3.29 | 12 | 3. Ditto | 46 | 1.02 | 14.3 |
| | 23 | 0.63 | 12 | | 60 | 1.33 | 14.3 |
| | 61 | 1.65 | 12 | 4. Ditto | 20 | 0.58 | 11 |
| | 14 | 0.385 | 12 | | 61 | 1.77 | 11 |
| | 241 | 6.6 | 12 | | | | |

The pinions on the earth's arm may be any two of equal numbers, both above and below; likewiſe on Jupiter's arm, and at the earth's axis: and when the diameters are taken, it is underſtood to be acroſs from the pitch line to the pitch line, without the ends of the teeth, which will be inverſely in length, as the number of teeth *per* inch.

*Orrery by Antide Janvier.*—A French work has juſt come to our hands, entitled "Des Révolutions des Corps Céleſtes par le Méchaniſm des Rouages," 1812, Paris, by an eminent mechanic, whoſe contrivances have been honoured by an examination and report upon them, made by the claſs of phyſical and mathematical ſciences at the Imperial Inſtitute of France. The author of this work, which is a thin quarto with eight plates, begins his deſcription of his new planetary machine, which correſponds to our definition of an orrery, by ſaying that "while the arbiter of Europe, at ſix hundred leagues diſtance from his capital, is directing, under another ſky, the vaſt conceptions of his genius, and of his policy, in the obſcurity of our retreat, without a miſſion and without a title, we preſume to form an enterprize almoſt beyond the reach of our powers, at a time when our intellectual faculties have arrived at their full extent; but the favourable regard of the great Napoleon, the coup-d'œil of Maria Louiſa, the deſire of becoming uſeful to the inſtruction of an auguſt prince called to ſucceed to ſo much glory, and to bear ſo many diadems; what more can be wanting to ſupport our courage, to enliven our hope, and to furniſh us with new activity for the culture of an art, in which we have already obtained conſiderable ſucceſs!"—Such is the exordium to the deſcription of this machine, from the peruſal of which we had hoped to gain much uſeful information for the ſervice of our readers, as well as amuſement for ourſelves; but, to our diſappointment, the author has not favoured the world with an account of the numbers that conſtitute the teeth of his wheelwork, and gives as a reaſon for ſuch omiſſion, the exiſtence in Paris, which we do not doubt, of a faithleſs ſet of people, who have the aſſurance to avail themſelves of other men's labours, and to perſuade the world that they are their own. However, as there is conſiderable ingenuity manifeſted in the arrangement of the different parts of this machine, as contained in his plate IV. and as we truſt that we have rendered the methods of calculating ſuitable numbers for repreſenting any given period ſufficiently eaſy under our article NUMBERS *Planetary*; we ſhall give the ſubſtance of the account, as it is before us, and leave the reader to exerciſe his ſkill in determining for himſelf ſuch practical numbers as this particular conſtruction demands, which taſk will afford a variety of further examples to our theory. In *Plate* VI. of our ſeries, entitled *Planetary Machines*, we have given a reduced copy of the ſection of all the wheelwork of this machine, which bears conſiderable reſemblance to the following plate, which is the ſection of a new orrery conſtructed in England, immediately before the account, at preſent under our notice, arrived, and which we have deſcribed as being the moſt modern and comprehenſive. A A B B, in *fig.* 1. repreſents the ſection of a braſs frame kept together by the pillars *a*, *a*, and ſupported by a table 5½ French feet in diameter, not ſeen in the plate. In this frame are contained the wheels for giving motion to the Earth, Mars, Jupiter, Jupiter's moons, and Saturn's moons; upon the upper plate of this frame is mounted a ſmaller frame, Y Y, ſupported by the ſhort pillars *z*, *z*, containing the wheels for giving motion to Saturn and Georgian, (or Herſchel,) and above this ſmall frame is another wheel for giving motion to the moons of Georgian. The interior planets Venus and Mercury have their wheelwork on the earth's arm, under the ſun, and the wheels for the ſatellites are at the extreme ends of the reſpective arms, while ſuch portions of the mechaniſm as could not be ſeen in *fig.* 1. are ſhewn in a detached ſtate in *figs.* 2 and 3. We ſhall retain the letters of reference of the author himſelf, and, in a great meaſure, his order of deſcription, but ſhall endeavour to avoid ſome of his repetitions. A long fixed axis of ſteel riſes out of the centre of the lower plate of the large frame, to which it is ſcrewed, by means of a circular ſhoulder-piece, faſt to the ſaid axis, into which axis the ſun S has its ſlender ſtem ſcrewed; the double wheel C D, with the part C contrate, turns in 48 hours, communicating motion to the earth's axis, and to our moon, by wheelwork placed at the upper end of a long tube, faſt to the double wheel, and revolving round the fixed ſteel axis; but this motion is taken from the wheel *x*, of half the ſize of the contrate wheel C, fixed on the horizontal arbor of the diurnal handle M. This arbor has two drivers fixed on it beſides *x*, namely, the contrate wheel *y*, driving the pinion *d*, and the pinion *b*, driving the contrate wheel E on a vertical arbor; to this arbor a ſecond pinion, *c*, is fixed, which drives the wheel F on another vertical arbor, and with it a ratchet wheel above, and the pinion *d*, before-mentioned, below it, and this pinion *d* again drives the wheel G in a year, which is therefore called the annual wheel. The pivot of the horizontal diurnal arbor is ſupported by the cock marked 13, and the arrangement of wheels and pinions which we have deſcribed is ſuch, that whether the handle of the diurnal arbor be turned round to the right or left, the annual wheel, G, will always proceed in the ſame direction, as may be thus explained: what may be called the ſlow motion, where 365¼ turns are made in a year, is tranſmitted through the ſucceſſive pinions *b*, *c*, and *d*, to the wheels E, F, and G, in the regular way; but when a retrograde motion is given to the handle, the pinion *d* is driven by the contrate wheel *y*, with a velocity one hundred times increaſed, and yet in the ſame direction as before; the wheel *y* has alſo a ratchet wheel behind it, like as the wheel F has, which ratchets allow their contiguous wheels to move looſely round their arbors one way round, but the clicks faſt to the wheels catch the teeth of the ratchets when going the other way, and attach them to their arbors reſpectively; but whenever the click of ratchet F impels this ratchet's teeth, the click of ratchet *y* ſlides without entering its teeth, and *vice verſâ*, the two ratchets having their teeth ſo ſloped in oppoſite directions, that they never oppoſe each other's action, but, on the contrary, when one ceaſes to act, at the inſtant the handle retrogrades, the other begins, and thus the pinion *d* continues its motion in the ſame direction at all times, if the handle move at all; but when the contrate wheel acts as its driver, its velocity becomes increaſed one hundred times, by being derived immediately from the handle through the wheel *y*, while the wheels E and F, with the pinion *c*, are moving in a detached ſtate, and in a reverſed direction, thereby producing no effect on the pinion *d*, which is alſo the caſe with wheel *y*, when the handle goes by a direct motion. This contrivance for giving both ſlow and quick motion alternately, is ſimple but ingenious, and the author ſays he introduced a contrivance for making all the planetary bodies move backwards, when required, as well as forwards, which cannot be done with the ratchet acting in the uſual way; but he has not thought proper to explain his method; though he ſays that it is by the uſe of the quick motion that the backward motions are effected by a third contrivance. This contrivance, however, becomes obvious on a little reflection, which may be thus: the exterior end of the diurnal arbor may be lowered by a ſliding motion of its bearing-piece, till the teeth of pinion *b* are detached from wheel E, while yet the teeth of the contrate wheel *y* will continue in action in pinion *d*, by reaſon

of its being nearer the interior end of the horizontal diurnal arbor, which is therefore not ſo much lowered as the exterior end, while the interior pivot remains in the hole of its cock: it will be neceſſary, notwithſtanding, to pin the ratchet to wheel *y*, for the time that this wheel is made to act in both directions, which may be readily done when a hole is drilled through both the ratchet and wheel *y* at the ſame diſtance from their centres of motion, and by the ſame drill. The tube of the annual wheel G turns immediately upon that of the double wheel of 48 hours, but reſts on the bridge 13, which ſupports the ſuperincumbent weight of the mechaniſm borne by this annual tube. Under the annual wheel G is made faſt to it the ſmall wheel *e*, that drives the wheel *f*, on a ſeparate vertical arbor, reſting on the bottom of the large frame, and ſupported at top by the braſs plate Y Y, in the upper or ſmall frame, which plate is ſaid to be circular. On this vertical arbor of *f*, are made faſt three other drivers, one wheel and two pinions, denoted by the letters *g*, *h*, and *i*; wheel *g* drives the tubed wheel H in the period of Mars; *h* drives the wheel I with its tube in the period of Jupiter; and *i* drives the wheel K in the ſmall or upper frame, in the period of Saturn. The bridge 14, above the annual wheel G, has a tube fixed to it, as ſeen in *fig.* 2. along with bridge 13, without a tube. The uſe of this tube will be ſeen preſently. To the wheel I of Jupiter is made faſt the ſmaller wheel *k*, which drives wheel A, placed on another vertical arbor, ſeen in *fig.* 3. detached, which arbor is ſupported behind the other works, in the manner that we have deſcribed the arbor of wheel *f* to be; then wheel B, on the upper part of this vertical arbor, drives wheel L in the ſmall frame above K, in the period of Georgian; hence the revolutions of Mars, Jupiter, and Saturn, are trains from the motion of a year, but the revolution of Georgian is by a train from the motion of Jupiter. Above the upper frame is placed a cock C, ſeen in *fig.* 3, which ſupports the fifth and laſt vertical arbor, with the wheels 10, 11, and 12 faſt to it, at different heights, proportioned to the heights of their fellow wheels; wheel 10 takes its motion from wheel D of 48 hours, and wheel 11 drives N, which has a quick motion of 48 hours alſo, if we may judge from the comparative diameters of theſe four wheels, D and N appearing to be each double to 10 and 11; but the pinion 12, at the top of the fifth arbor, drives wheels *o* more ſlowly, for the firſt mover of Georgian's ſatellites. The bridge 15 has alſo a tube faſt to it, which will have its uſe deſcribed in its place. The reſt of the mechaniſm which follows ſtands above the frame, and is in ſight, which we will now proceed to deſcribe, as we aſcend from the frame. The large contrate wheel *o*, with its teeth pointing upwards, is faſt to the top of the tube of wheel O above the frame, that revolves round the tube of wheel L in the ſmall frame; this wheel *o* gives motion to Georgian's ſatellites, by means of the long pinion ſeen over it, which is carried round by Georgian's arm in his period, with their teeth in connection, on which account this long pinion has a compound motion, one part of which is derived from the revolutions of wheel *o* coming more immediately from the handle, and the other ariſes from the motion of the arm that carries the pinion round the large wheel in Georgian's period; this ſecond portion, being in the ſame direction as the principal motion, produces an acceleration in the motion of the pinion, of as many revolutions as its teeth are contained in thoſe of the wheel, during the whole period of Georgian. The arm is not, as uſual, placed on the top of Georgian's tube, but turns round an excentric circular piece of braſs W, attached to the top of a tube, borne by the plate, Y Y, of the ſmall frame, and receives its motion from a pin 3, at the remote end of a bar 3 7, which bar is inſerted on the tube of Georgian's wheel L, and revolves in his period; hence the arm itſelf revolves round the excentric piece, W, as its centre of motion, and therefore the planet carried by it has its diſtance and velocity conſtantly changing in every part of its orbit, as have alſo the ſecondaries, in a certain degree. But it is not mentioned what proportion the excentric point, or centre of piece W, meaſured from the centre of the concentric tubes, bears to the whole arm, or radius vector: if it is in the ſame ratio as the excentricity of the orbit itſelf is to the planet's mean diſtance, then the variation of diſtances will be properly enough repreſented in the excentric orbit, but the equations of the centre will be only one-half its due quantity; on the contrary, if the excentric point be placed at double the diſtance of the proportional excentricity of the orbit, then the equation will be right, but the variation of diſtances will be too much by one-half; which obſervation is equally true, as it reſpects the other excentric arms hereafter to be deſcribed. The arm of Georgian has a long opening in the direction of its length, to admit the pin 3 to paſs through it, which therefore acts like the crutch of a clock, except that here the motion imparted is always in one direction. The horizontal arbor of the long pinion has another pinion at its remote end, that is not required to be long, becauſe its action is not with a wheel that is perpetually altering the effective length of its radii, as is the caſe with the large wheel o. The ſix moons of Georgian receive their motion from this ſhort pinion thus; the contrate wheel, *c*, is made, by the calculation, to revolve in the period of the firſt ſatellite, or in $5^d\ 21^h\ 25^m$, and carries wheel *d* round with it in the ſame period; then wheel *e* takes this motion, whether modified or not does not appear, and its arbor takes four pinions, one above another, which drive each its fellow, on a ſmall tube, in the reſpective periods of the 2d, 3d, 4th, and 5th ſatellites; but the period of the 6th ſatellite, being comparatively long, is taken from the period of the 5th, by the wheel *a* driving *b* on a ſeparate arbor in $38^d\ 1^h\ 49^m$; while a ſecond pinion, placed over it, drives the wheel R, of the 6th ſatellite, in its period of $107^d\ 16^h\ 40^m$. From a conſideration of this combination of wheels and pinions, the reader will ſee that Georgian's moons, like the long pinion, have their mean motions accelerated in one part of this planet's orbit, and retarded in the other, by reaſon of the long arm having its centre of motion out of the centre of the large wheel's motion; the latter of which may be ſaid to give the mean motions, and the former the equations, or variations that derange thoſe mean motions, and that depend on the place of Georgian's anomaly at any time. In like manner, Saturn and Jupiter have their ſyſtems of moons actuated by the double contrate wheel *n n*, carried by the tube of wheel N before deſcribed: the teeth that point downwards drive Saturn's moons, and thoſe that point upwards Jupiter's. The excentric piece, round which Saturn's arm revolves, is marked Z on the fixed tube of the plate A A of the frame; and the bar 5 6, that impels this arm by the pin 6, is faſt to the tube of wheel K in the ſmall frame: the long pinion, carried round by the arm of this planet, is in connection under the wheel *n n*, which impels it, but experiences the ſame ſort of acceleration that we have deſcribed in the caſe of Georgian's long pinion: the ſhort pinion at the remote end of the arm acts alſo under the teeth of its contrate wheel *a*, that, we are told, revolves in $0^d\ 22^h\ 40^m\ 4.^s6$, or period of the firſt of his ſeven ſatellites. From this period wheel *b*, on a ſide arbor, takes its motion, and carries four other pinions above it, which drive their correſponding tubed wheels 2, 3, 4, and 5, in the periods of the 2d, 3d, 4th, and 5th ſatellites; from the

period

period of the 5th, *viz.* $4^d\ 12^h\ 27^m\ 55^s$, the wheel *c* gives motion to another ſide arbor, by means of wheel *d*; and this laſt arbor carries again two driving pinions, that impel the two laſt wheels 6 and 7, the latter of which, near Q, is ſaid to revolve in $79^d\ 22^h\ 3^m\ 12^s$. Again, Jupiter's arm, *t t*, revolves round the excentric piece *q*, placed on the tube of bridge 15, and is counterpoiſed by the weight *t 3*; this long pinion, *a*, acts, like Georgian's, above the large double contrate wheel *n n*, and experiences a ſimilar acceleration to that of Saturn in kind, but not in quantity; for the excentric pieces are of different dimenſions, and each is placed in the direction of its own line of the apſides: the bar 3 4, on the tube of wheel I, drives this arm by the pin 4, entering the oblong perforation in the arm *t t*, and the ſhort pinion, *b*, drives the contrate wheel, *c*, at the remote end of the arm, in $1^d\ 18^h\ 28^m\ 36^s$, the period of the firſt ſatellite of this planet; the wheel attached to this contrate wheel, *c*, drives *d*, on a ſide arbor, and with it three more pinions on this common arbor, each of which impels its fellow 2, 3, and 4 reſpectively in the periods of the 2d, 3d, and 4th ſatellites. The little arms of all the ſatellities are connected with as many tubes, taking their motions from the laſt moving wheels, as ſeen in the drawing, without further deſcription; but it will have been remarked, that all theſe ſecondaries in this machine are made to move in the ſame plane with that of the ecliptic, which in nature is the caſe with Jupiter's only; conſequently the motions of both Georgian's and Saturn's moons, however accurately their periods may be produced by the wheelwork, are in improper directions relatively to the orbits of their primaries, as well as to all the other parts of the ſolar ſyſtem. Next above Jupiter comes the arm of Mars, revolving round the excentric piece *p*, placed on the tube of bridge 14, and impelled by the pin 2 of the bar 1 2, attached to the tube of wheel H: this planet, conſequently, has an excentric motion in his orbit; but having no moons, requires only a ſimple arm. Over Mars is placed the Earth's annual arm with its appendages, which are neceſſarily on a ſmall ſcale, and which the author has put in an enlarged ſection on a ſeparate plate, containing the mechaniſm for the earth's parallelhſm and diurnal rotation, the periodic motion of the moon, and the retrogradation of the nodes of her orbit, together with the revolutions of Venus and Mercury round the ſun; all which we will now deſcribe in ſucceſſion. The wheel *r* is fixed faſt to the tube of bridge 14, and *s s*, the earth's arm, or annual frame, revolves with the tube of the annual wheel G, before deſcribed: the wheels under this frame are deſtined to preſerve the parallelism of the earth's axis, in order to do which exactly, the firſt and third wheels muſt be of like numbers, with any number for the intermediate one to change the direction of motion; but the author propoſes a train that may make the pole of the ecliptic have a revolution in 25,670 years, or to fall back one degree in 72 years, for effecting the preceſſion of the equinoctial points: the train that he propoſes to uſe for this purpoſe, to be ſubſtituted for the ordinary wheels of parallelism, are $\frac{151}{133} \times \frac{170}{193} = \frac{25670}{25669}$, in which fraction there is a difference between the numerator and denominator of unity; or $\frac{1}{25670}$ part of the whole would be the annual quantity of deviation from ſtrict parallelism; but it is eaſy to ſee, that the adoption of theſe large numbers would require the earth's arm to be much longer than its proper proportion in the machine requires to contain them; or otherwiſe the excentric pieces would require to be greatly, and therefore inconveniently enlarged, by adding to the length of the planetary arms, and the long pinions would by ſuch alteration become too much elongated for due action in both ſemicircles of their reſpective wheels. On the top of the axis of the third wheel of parallelism is ſupported the earth by an exterior ring, into which his axis is pivoted above and below, and by means of which any quantity of inclination may be given to this axis, with reſpect to a perpendicular line. The ſecond, or intermediate wheel of parallelism, has however the ſame number of teeth as the other two, with which it is connected, and has a vertical arbor ſupported by the ſame cock under the earth's arm, that ſupports the arbor of the third wheel and the earth above it; we ſhall preſently ſee the uſe of this, which we will call the annual arbor, as it revolves juſt once in each year: juſt above the earth's arm revolve alſo three other wheels, *u*, *v*, and *w*; the wheel *u* is on the tube of C D of 48 hours, *v* revolves in the ſame time, but *w*, having only one-half the number of teeth, makes a revolution in 24 hours, or rather would do ſo if the earth's arm had no annual motion; but by reaſon of the annual motion, the wheel *w* receives two additional revolutions in the year, and theſe two additional revolutions are balanced by a drawback of two days, occaſioned partly by the retrograde motion of the wheel of parallelism, which carries the pinion of the earth's axis once round the central pinion on the tube of 24 hours motion, thereby making it revolve, and partly by the earth's circuit round the ſun, whilſt the axis preſerves its parallelism, by which circuit the ſun appears to move retrograde round the earth once in a year. This balance of the two oppoſite compound motions has been minutely explained in our deſcription of the preceding inſtruments, to which the reader is referred. The little earth has beſides two interior circles ſurrounding it, one for a meridian circle, and the other for an horizon, which is adjuſtable for any latitude, by ſliding up and down within the other, while the pivots of an equatorial fixed axis allow the horizon circle to turn on them for effecting the different degrees of inclination. The moon's monthly motion is taken from the ſecond wheel of 48 hours by a train of two pinions, and as many wheels, ſeen in the figure, ſupported by the two cocks above the annual frame. We have already ſaid that the ſecond, or middle wheel of parallelism, under the annual frame, has a vertical arbor, which we propoſed to call the annual arbor: on the upper end of this is a wheel which drives the nodes wheel round in its period of $6798^d\ 4^h$, and the tube of this wheel carries the inclined plate on which the moon's ſtem reſts during her monthly motion in the uſual way. Again, the upper wheel on the annual arbor, which is repreſented in a line with wheel *x*, but which is actually on one ſide of it, and in contact with it in the machine, gives motion to this wheel *x*, on an arbor that has beſides both a pinion and a wheel made faſt to it: theſe two, revolving together probably in the ſpace of a year, drive each a correſponding wheel and pinion, namely, the pinion for Venus drives wheel *y*, and the wheel for Mercury the pinion *z*, each with its reſpective tube and attached arm, in their due periods. In this arrangement, the planets Venus and Mercury, as alſo the Earth and Moon, move in their orbits with equable motion; but in the enlarged ſection above alluded to, the author recommends the introduction of an excentric piece without a fixed tube (which, indeed, cannot be here introduced), but a pair of wheels are propoſed to be added to preſerve the annual parallelism of this excentric piece, thereby rendering the mechaniſm more complex than uſeful, as it relates to Venus; for this planet has but little excentricity in its orbit, and conſequently a very ſmall equation of its centre. The ſuggeſtion of this mechaniſm, which does not appear to have been adopted, is intended apparently to ſhew the ingenuity of the contriver rather than the utility of its adoption

adoption in practice. The little wheels for the parallelism of the moon's phase are also proposed in the larger section, but not introduced on the moon's arm in the machine, by reason of the scale on which the excentric pieces demand that the machine should be constructed, to have easy motion. The four newly discovered planets are entirely omitted in this construction; for which omission the author apologises, by stating how they might have been added from Jupiter's arm, as Venus and Mercury have their motions taken from the Earth's annual frame; but the great excentricity of some of these four orbits, no doubt, presenteddifficulties more easily explained away in theory than overcome in practice, where, at the least, two excentric pieces must have been introduced without any tubes to support them on, except such as must have been made stationary by the opposition of two equal motions produced in contrary directions. Hence the author's original idea of giving motion to *all the primary planets*, and to their secondaries, which he says he at first contemplated, was not put in execution. In our opinion, the orrery would have been more complete if all the primary planets had been represented in motion, with such of the secondaries only as are useful in astronomy, geography, or navigation, and as are to be seen with telescopes of moderate magnifying powers, which was the plan proposed by the inventor of the machines which were immediately before described.

After having particularized the different orreries that appear to us worthy of public notice, we conceive that it will be rendering the instrument-maker an acceptable service, if we subjoin here such tables of the sun and moon as are necessary for graduating the different plates of indication for exact degrees and parts of a degree, which could not be done from the ordinary tables, where the arguments, or angular distances, are given in whole degrees, and the corresponding equations, &c. in degrees, minutes, and seconds; whereas the former are required to be in degrees and minutes, and the latter in whole degrees, halves, and quarters, to represent the dividing strokes. The conversion of the tables into other terms of the same relative values, has been a work of some labour, but was necessary for our purpose; and the tables thus arranged will afford the ready means of laying down the dividing strokes of each graduated circle, by the help of any of the usual modes of measuring angular distances along the circumference of a circle. For instance, suppose the moon's mean heliocentric latitude were to be inserted on a plate; with the extent 2° 47′.2 from Tab. V. in the dividers set off both ways from each node, and the stroke 0° 15′ will be given in four places: again, with the extent 5° 34′.9 set off for the strokes 0° 30′, and in like manner for any other dividing stroke that is required in any of the divided circles.

TABLE I.—Equation of the Sun's Centre.

| Argument. Apogee | Equation. | Argument. Perigee | Equation. |
|---|---|---|---|
| 5° 5′ | 0° 0′ 10 | 4° 52′ | 0° 0′ 10 |
| 10 11 | 0 20 | 9 46 | 0 20 |
| 15 23 | 0 30 | 14 45 | 0 30 |
| 20 41 | 0 40 | 19 51 | 0 40 |
| 26 11 | 0 50 | 25 9 | 0 50 |
| 31 57 | 1 0 | 30 41 | 1 0 |
| 38 3 | 1 10 | 36 36 | 1 10 |
| 44 42 | 1 20 | 43 2 | 1 20 |
| 52 10 | 1 30 | 50 17 | 1 30 |
| 61 4 | 1 40 | 58 59 | 1 40 |
| 73 29 | 1 50 | 71 11 | 1 50 |
| 80 10 | 1 55 | 83 46 | 1 55 |
| 91 20 | 1 55½ | 88 40 | 1 55½ |

TABLE II.—The Sun's Declination with the correspondent Distances in the Ecliptic from Aries and Libra both ways.

| Argument. | Declination. |
|---|---|
| 2° 30′.7 | 1° |
| 5 1.7 | 2 |
| 7 33 | 3 |
| 10 5.2 | 4 |
| 12 38.6 | 5 |
| 15 12.9 | 6 |
| 17 49.2 | 7 |
| 20 27.15 | 8 |
| 23 7.8 | 9 |
| 25 50.9 | 10 |
| 28 37.5 | 11 |
| 31 27.1 | 12 |
| 34 23.3 | 13 |
| 37 24.2 | 14 |
| 40 31.75 | 15 |
| 43 47.6 | 16 |
| 47 13.9 | 17 |
| 50 53.2 | 18 |
| 54 49.7 | 19 |
| 59 10.6 | 20 |
| 64 7.8 | 21 |
| 70 9.3 | 22 |
| 78 50 | 23 |
| 90 0 | 23½ |

TABLE III.—Reduction of the Ecliptic to the Equator.

| Argument. ☉ ° | ′ | Equation. ° | ′ | |
|---|---|---|---|---|
| 3 | 2 | 0 | 15 | |
| 6 | 5 | 0 | 30 | |
| 9 | 12 | 0 | 45 | |
| 12 | 25 | 1 | 0 | |
| 15 | 46 | 1 | 15 | |
| 19 | 25 | 1 | 30 | |
| 23 | 24 | 1 | 45 | |
| 28 | 0 | 2 | 0 | |
| 33 | 21 | 2 | 15 | |
| 36 | 30 | 2 | 20 | |
| 40 | 4 | 2 | 25 | |
| 46 | 15 | 2 | 28 | 23″.6 |
| 52 | 21 | 2 | 25 | |
| 55 | 51 | 2 | 20 | |
| 58 | 23 | 2 | 15 | |
| 64 | 0 | 2 | 0 | |
| 68 | 21 | 1 | 45 | |
| 72 | 13 | 1 | 30 | |
| 75 | 27 | 1 | 15 | |
| 78 | 34 | 1 | 0 | |
| 81 | 33 | 0 | 45 | |
| 84 | 25 | 0 | 30 | |
| 87 | 13 | 0 | 15 | |
| 90 | 0 | 0 | 0 | |

TABLE IV.—For the Moon's mean Equation of the Centre.

| Argument. Apogee | Equation. | Argument. Perigee | Equation. |
|---|---|---|---|
| 4° 51′.6 | 0° 0′ 30 | 4° 14′.5 | 0° 0′ 30 |
| 9 44.7 | 1 0 | 8 31.3 | 1 0 |
| 14 41.7 | 1 30 | 13 50.1 | 1 30 |
| 19 44.1 | 2 0 | 17 15.2 | 2 0 |
| 24 54.5 | 2 30 | 21 48.6 | 2 30 |
| 30 16.3 | 3 0 | 26 33.0 | 3 0 |
| 35 53.4 | 3 30 | 31 32.6 | 3 30 |

| Argument. Apogee | | Equation. | | | Argument. Perigee | | Equation. | | |
|---|---|---|---|---|---|---|---|---|---|
| 41 | 51.3 | 4 | 0 | | 36 | 53.1 | 4 | 0 | |
| 48 | 19.5 | 4 | 30 | | 42 | 43.6 | 4 | 30 | |
| 55 | 33.9 | 5 | 0 | | 49 | 19.9 | 5 | 0 | |
| 64 | 7.1 | 5 | 30 | | 57 | 15.4 | 5 | 30 | |
| 74 | 45.7 | 6 | 0 | | 68 | 16.4 | 6 | 0 | |
| 94 | 0 | 6 | 18 | 31″.6 | 86 | 0 | 6 | 18 | 31.″6 |

TABLE V. For the Moon's mean heliocentric Latitude.

| Argument. Node | | Latitude. | | |
|---|---|---|---|---|
| 2° | 47.′2 | 0 | 15 | |
| 5 | 34.9 | 0 | 30 | |
| 8 | 23.3 | 0 | 45 | |
| 11 | 12.9 | 1 | 0 | |
| 14 | 4.0 | 1 | 15 | |
| 16 | 57.6 | 1 | 30 | |
| 19 | 53.7 | 1 | 45 | |
| 22 | 53.2 | 2 | 0 | |
| 25 | 56.7 | 2 | 15 | |
| 29 | 5.1 | 2 | 30 | |
| 32 | 19.3 | 2 | 45 | |
| 35 | 41.7 | 3 | 0 | |
| 39 | 11.0 | 3 | 15 | |
| 42 | 52.5 | 3 | 30 | |
| 46 | 47.8 | 3 | 45 | |
| 51 | 1.8 | 4 | 0 | |
| 55 | 41.4 | 4 | 15 | |
| 60 | 59.4 | 4 | 30 | |
| 67 | 22.6 | 4 | 45 | |
| 76 | 18.1 | 5 | 0 | |
| 90 | 0 | 5 | 8 | 48.″9 |

TABLE VI.—Table for graduating the Moon's horizontal Parallax to the mean Excentricity of .055, &c.

| Argument. Moon's true Anomaly. | | | Moon's Horiz. Parallax. | Argument. Moon's true Anomaly. | | | Moon's Horiz. Parallax. | Argument. Moon's true Anomaly. | | | Moon's Horiz. Parallax. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| s | ° | ′ | ′ | s | ° | ′ | ′ | s | ° | ′ | ′ |
| O. | 0 | 0 | 54.0 | II. | 11 | 20 | 56.2 | III. | 22 | 18 | 58.4 |
| | 9 | 0 | 54.1 | | 13 | 20 | 56.3 | | 24 | 20 | 58.5 |
| | 17 | 0 | 54.2 | | 15 | 20 | 56.4 | | 26 | 20 | 58.6 |
| | 22 | 30 | 54.3 | | 17 | 10 | 56.5 | | 28 | 20 | 58.7 |
| | 27 | 0 | 54.4 | | 18 | 54 | 56.6 | IV. | 0 | 22 | 58.8 |
| I. | 0 | 36 | 54.5 | | 20 | 42 | 56.7 | | 2 | 42 | 58.9 |
| | 4 | 0 | 54.6 | | 22 | 30 | 56.8 | | 4 | 52 | 59.0 |
| | 7 | 0 | 54.7 | | 24 | 18 | 56.9 | | 7 | 6 | 59.1 |
| | 10 | 0 | 54.8 | | 26 | 6 | 57.0 | | 9 | 22 | 59.2 |
| | 12 | 52 | 54.9 | | 28 | 2 | 57.1 | | 11 | 36 | 59.3 |
| | 15 | 45 | 55.0 | III. | 0 | 0 | 57.2 | | 14 | 8 | 59.4 |
| | 18 | 14 | 55.1 | | 1 | 48 | 57.3 | | 16 | 42 | 59.5 |
| | 20 | 42 | 55.2 | | 3 | 36 | 57.4 | | 19 | 30 | 59.6 |
| | 22 | 50 | 55.3 | | 5 | 24 | 57.5 | | 22 | 30 | 59.7 |
| | 25 | 0 | 55.4 | | 7 | 12 | 57.6 | | 25 | 30 | 59 8 |
| | 27 | 8 | 55.5 | | 9 | 0 | 57.7 | | 28 | 48 | 59.9 |
| | 29 | 15 | 55.6 | | 10 | 48 | 57.8 | V. | 2 | 24 | 60.0 |
| II. | 1 | 21 | 55.7 | | 12 | 4 | 57.9 | | 6 | 45 | 60.1 |
| | 3 | 20 | 55.8 | | 14 | 35 | 58.0 | | 12 | 0 | 60.2 |
| | 5 | 20 | 55.9 | | 16 | 30 | 58.1 | | 19 | 30 | 60.3 |
| | 7 | 20 | 56.0 | | 18 | 21 | 58.2 | | 27 | 0 | 60.35 |
| | 9 | 20 | 56.1 | | 20 | 12 | 58.3 | VI. | 0 | 0 | 60.35 |

TABLE VII.—For graduating the Moon's mean horizontal Diameter, the Excentricity being .055, &c.

| Moon's Horiz. Paral. | Moon's Horiz. Diam. | Moon's Horiz. Paral. | Moon's Horiz. Diam. | Moon's Horiz. Paral. | Moon's Horiz. Diam. |
|---|---|---|---|---|---|
| ′ | ′ | ′ | ′ | ′ | ′ |
| 54.00 | 29.7 | 56.18 | 30.9 | 58.36 | 32.1 |
| 54.18 | 29.8 | 56.36 | 31.0 | 58.54 | 32.2 |
| 54.36 | 29.9 | 56.54 | 31.1 | 58.72 | 32.3 |
| 54.54 | 30.0 | 56.72 | 31.2 | 58.91 | 32.4 |
| 54.72 | 30.1 | 56.91 | 31.3 | 59.09 | 32.5 |
| 54.91 | 30.2 | 57.09 | 31.4 | 59.27 | 32.6 |
| 55.09 | 30.3 | 57.27 | 31.5 | 59.45 | 32.7 |
| 55.27 | 30.4 | 57.45 | 31.6 | 59.64 | 32.8 |
| 55.45 | 30.5 | 57.64 | 31.7 | 59.82 | 32.9 |
| 55.64 | 30.6 | 57.82 | 31.8 | 60.00 | 33.0 |
| 55.82 | 30.7 | 58.00 | 31.9 | 60.18 | 33.1 |
| 56.00 | 30.8 | 58.18 | 32.0 | 60.36 | 33.2 |

TABLE VIII. Equations of the mean high Tides.

| Distance of ☉ to ☾. | Perigee of ☾. | Mean Dist. of ☾. | Apogee of ☾. |
|---|---|---|---|
| Argument. | Equation. | Equation. | Equation. |
| 0° | + 18$^m$ | + 22$^m$ | + 27½$^m$ |
| 10 | 9½ | 11½ | 14 |
| 20 | — 0 | — 0 | — 0 |
| 30 | 9½ | 11½ | 14 |
| 40 | 18 | 22 | 27½ |
| 50 | 26 | 31½ | 39½ |
| 60 | 33 | 40 | 50 |
| 70 | 37½ | 45 | 56 |
| 80 | 38½ | 46½ | 58 |
| 90 | 33½ | 40½ | 50½ |
| 100 | 21 | 25 | 31 |
| 110 | + 0 | + 0 | + 0 |
| 120 | 21 | 25 | 31 |
| 130 | 33½ | 40½ | 50½ |
| 140 | 38½ | 46½ | 58 |
| 150 | 37½ | 45 | 56 |
| 160 | 33 | 40 | 50 |
| 170 | 26 | 31½ | 39½ |
| 180 | 18 | 22 | 27½ |

In *Plate* IX. of *Planetary Machines*, we have given the eight circles, properly graduated from these eight tables, a comparison of which, with their respective tabulated numbers, will render the method of putting in the dividing strokes perfectly intelligible. The tables proper for the equations, latitudes, &c. of the other planets will be given under our article PLANETARIUM, where it is hoped we shall be able to include those of the four newly discovered planets, some of which we have already calculated.

ORRERY, *Rectification of.* The orrery has heretofore been considered as a machine, serviceable only for general illustration, and in its former unimproved state its powers were certainly very limited, both as to accuracy and extent; but in the hands of a skilful instructor, the improved orreries, which, for the first time, we have now presented to the scientific world, are capable of explaining, with considerable minuteness, the principal phenomena of the Copernican

ſyſtem, and thoſe in the moſt natural way. It would lead us beyond our original intention to arrange and exemplify a ſyſtematic ſeries of problems, that may be ſolved by the moſt improved orrery, which we hope ſoon to ſee publiſhed in a ſeparate pamphlet; but we conceive our article will not be conſidered as complete without the addition of ſome general precepts for its rectification, that may enable its poſſeſſor to avail himſelf of its extenſive powers in ſuch way as may be moſt ſubſervient to his purpoſe. We muſt take for granted that the proprietor of an orrery has provided himſelf with a ſcrew-driver, and that he is able to take in pieces, and to put together, ſuch parts of the machine at leaſt as are neceſſary to be detached, either for package and carriage, or for adjuſtment; whether theſe parts are kept together by clamping pieces, or by cloſe fitting by means of friction. Our precepts ſhall not be confined to any particular conſtruction, but ſhall include what is moſt neceſſary to be done in any of the machines for giving inſtruction.

If we ſuppoſe the machine to be of the moſt comprehenſive kind, the rectification of it will contain all that is requiſite for rectifying any of the more limited ſort, and therefore we will ſuppoſe that all the primary planets, and the Earth's and Jupiter's ſecondaries, are to be put to their reſpective ſituations for a given time. It has been uſual to put the primary planets in the common orreries and planetaria, where the motions are *mean*, to their apparent or *equated* places, as ſhewn in the Nautical Almanac, or in White's Ephemeris taken from it, as though the mean and equated places were the ſame; whereas they never coincide, except in the perihelion and aphelion points of their reſpective orbits: when, therefore, an orrery is to be rectified for a given time, the firſt conſideration is, whether the motions are *mean* or *equated*; if they are the former, the places of the planetary bodies, ſo moving, muſt be aſcertained from the tables of mean motion reſpectively, which we have given, or may hereafter give, in their places, and then the reſpective equations of the centre, depending on their diſtances from their aphelion points, as exhibited in the proper tables, will give the true, apparent, or equated places, which epithets mean the ſame thing; but if the conſtruction of the orrery be ſuch, that the equated places are at all times repreſented by ſome ſort of equation mechaniſm, then the Nautical Almanac, or White's Ephemeris, will be a ready and proper guide for rectification; though when theſe are neither of them at hand for the given year, the tables that give both the mean motions and equations may be ſubſtituted. In general it will be found moſt convenient to adjuſt the planetary bodies to their places for the beginning of the year, if the motions repreſented are *mean*, becauſe they are given in the tables without calculation, and then turning the handle till the annual index arrives at the given day, will put all the bodies that have motion to their reſpective mean places for the day ſo indicated; but where the equated motions are produced, the rectification may be made from the almanac with equal convenience on any day of the year, that is there ſpecified as having the heliocentric places ready calculated. For the ſake of exemplification we will take the beginning of the year 1813, as the time for which an orrery, for either mean or equated motions, is required to be rectified, and the requiſite places will be found, as they appear in the ſubjoined table; *viz.*

| Planets. | Mean Longitude. | Aphelion. | Mean Anomaly. | Equation of the Centre. | Heliocentric and equated Longitude. |
|---|---|---|---|---|---|
| | s ° ′ ″ | s ° ′ ″ | s ° ′ ″ | s ° ′ ″ | s ° ′ ″ |
| Mercury - - | 3 8 48 36 | 8 14 33 2 | 6 24 15 34 | + 0 12 28 50 | 3 21 17 26 |
| Venus - - | 6 12 15 29 | 10 8 46 43 | 8 3 28 46 | + 0 0 42 30 | 6 12 57 59 |
| Earth - - | 3 10 44 39 | 9 9 42 28 | 6 1 2 11 | + 0 0 2 1 | 3 10 46 40 |
| Mars - - | 6 20 51 44 | 5 2 37 48 | 1 18 13 56 | — 0 7 22 3 | 6 13 29 41 |
| Veſta - - | 1 15 52 45 | 2 9 50 32 | 10 6 2 13 | + 0 7 26 0 | 1 23 18 45 |
| Juno - - | 11 13 52 25 | 7 23 17 1 | 3 20 35 24 | — 0 29 34 0 | 10 14 18 25 |
| Ceres - - | 9 25 51 37 | 10 26 37 59 | 10 29 13 38 | + 0 4 14 0 | 10 0 5 37 |
| Pallas - - | 9 13 41 4 | 10 1 12 21 | 11 12 28 43 | + 0 6 34 0 | 9 20 15 4 |
| Jupiter - - | 3 26 30 38 | 6 11 20 39 | 9 15 9 59 | + 0 5 14 15 | 4 1 44 53 |
| Saturn - - | 9 12 8 11 | 8 29 18 29 | 0 12 49 42 | 0 1 20 19 | 9 10 47 51 |
| Georgian - - | 7 19 21 54 | 11 17 32 16 | 8 1 49 38 | — 0 4 50 36 | 7 24 12 30 |
| | | Apogee. | | | |
| Moon - - | 9 0 25 40 | 1 4 27 12 | 7 25 58 28 | + 11 22 58 18 | 8 23 23 58 |
| Moon's node - | | | | | 4 21 47 0 |

In this table the firſt column contains the names of the planets; the ſecond gives the mean longitudes from the tables of the epochs; the third ſhews the place of the aphelion or apogee reſpectively; the fourth gives the difference between the ſecond and third columns, when the latter is ſubtracted; the fifth contains the correſponding equation of the centre, taken from the table of mean anomalies, and the ſixth ſhews the ſum or difference of columns 2 and 5, which is the equated longitude as ſeen from the ſun. This laſt column would be the ſame as the column of heliocentric longitudes in the almanac, if the minor equations had been attended to, as contained in the tables; but the amount of theſe is ſo ſmall, that they may be neglected without ſenſible error in the adjuſtments of the planetary bodies, when the places are not taken from the almanac. In this manner a table may be eaſily conſtructed for the beginning of any particular year, but let it be remembered that the epoch for the planets begin the year on December 31, 1812, but the ſun (or earth) and moon on January 1, 1813, at noon, according to Lalande's tables: alſo that the place of the earth muſt be taken juſt ſix ſigns from that calculated for the ſun from the ſolar tables. Whenever an orrery for mean motions is rectified it muſt be from column 2, and the equation in column 5 ſhews, by reverſing the ſigns + and —, how much the place is before or behind the *apparent* or *true* place at the beginning of the year; as for any other time the longitude of the aphelion muſt be taken from the place of mean motion, for the mean anomaly, as the argument for the correſponding equation to be added or ſubtracted, accordingly as the quantity is more or leſs than ſix ſigns: but when an orrery

that

that produces equated motion is uſed, the laſt column contains the proper places for the planets to be rectified by; and, when once rectified, ſuch machine will require no further calculation for any ſubſequent equation, becauſe the planets move through equal areas in equal times, as in nature. We might have added another column for the heliocentric latitude of the planets, but as theſe are given (except for the four newly diſcovered planets) in the almanac, it would be adding to the labour of conſtructing ſuch table, without producing a correſponding advantage. In putting the planetary arms to the places laid down in the table, a ſilken thread carrying a ſmall plummet will be uſeful to hold up in ſuch way, that the eye may view it biſecting both the planetary ball and the ſun, leſt there ſhould be too great a parallax in the place of the planet, when placed without ſuch guide to its proper ſign and degree. It may be unneceſſary to add, that the exact place of the planet in the ecliptic circle ſhould be covered by the thread when it biſects both the planet and ſun.

When the mean motions are uſed, the equations of the centre may be allowed for by a joint in the perpendicular ſtem of the arm, and then the geocentric places may be obtained by ſtretching a ſilken thread from the earth's ſtem acroſs the ſmall ecliptic circle to any particular planet, at a given time; but in the orreries for equated motion no ſuch manual allowance will be neceſſary. We will now ſuppoſe the arms adjuſted to the heliocentric longitudes, mean or equated, as the caſe may be; and that the earth and moon want adjuſting: let the moon be firſt put to her longitude, after the ſmall ecliptic circle is made parallel to the outer or large one, by means of the ſilken thread extended over the ſimilar diviſions of both; then adjuſt the nodes plate, and apogeal index, together with the lunar plate for the moon's age, tides, phaſes, &c. according to the calculations in the table, or places given in the almanac; after theſe adjuſtments, which ſhould leave the centre of the moon at the ſame height as the centre of the earth, when the moon has no latitude, the circles of the globe muſt be put ſuitable to the latitude for which the problems are to be performed, as well as for the longitude; that is, the meridian circle muſt paſs over the given place, and the horizon circle muſt have it equidiſtant from every part of its circumference, or, in other terms muſt have the ſaid place in its pole; theſe circles, once fixed acroſs one another at right angles, muſt not be altered till ſome problem is to be ſolved for a new latitude or longitude, or both, as the caſe may be; but muſt be ſuffered to revolve with the earth, care being taken that the eaſtern and weſtern points of the horizon circle biſect the globe when the adjuſtment is finiſhed, and alſo that the points of the meridian circle, in contact with the horizon circle, be at the latitude and co-latutide of the place reſpectively.

Adjuſt now the lens for converging the ſolar ray to the height of the earth's and moon's centres, and give it the proper focal diſtance, and examine that the direction of the earth's axis be parallel to a line joining the ſolſtitial points: if theſe adjuſtments are all properly made, the luminous focal point will fall on the tropic of Cancer at midſummer, on the tropic of Capricorn at midwinter, and on the equator at the equinoxes. The proper inclination of the earth's axis will be proved by trying if the focal point will keep in the ecliptic circle of the globe from the vernal equinox to the ſame again, when the annual motion is given without the diurnal, while the parallelism is preſerved. When theſe adjuſtments are finiſhed, bring the meridian circle to the ſolar ray, and put the horary index to noon; and if both ſolar and ſidereal time are indicated by the ſame dial, the diſtance between the two hands muſt be put equal to the ſun's mean right aſcenſion at the time, and then the two hands will coincide when the ſun enters Aries, which therefore is the beſt time for examining the relative poſition of the ſaid hands. Laſtly, let the week hand, the hand for Jupiter's meridian paſſage, and ſuch other hands as there may be yet unadjuſted, be put to their proper places, and take notice that all the motions of the hands and planets begin with the motion of the handle, as nearly as may be, which may be managed by turning till the wheels are all in action before the hands are finally placed. When all the adjuſtments are finiſhed the orrery ſhould be ſo placed that the pole of the earth may point towards the correſponding pole in the heavens, and then the motions of the different bodies will be referred to their correſponding places in the heavens, on each ſide of the earth.

With reſpect to the ſatellites of Jupiter, the table of immerſions and emerſions in the Nautical Almanac, or Ephemeris, will be the moſt convenient guide for rectification, the application of which is obvious by mere inſpection. Thus, the neareſt immerſion of the firſt ſatellite to the beginning of the year 1813, is on the 31ſt of December 1812, at $9^h\ 38^m$, and the next ſubſequent one on January 2, 1813, at $4^h\ 6^m$ nearly; the ſecond has its immerſion into the ſhadow of Jupiter on December 31, 1812, at $5^h\ 26^m$, and again on January 3, at $18^h\ 44^m$ nearly; the third on January 1, at $16^h\ 46^m$, and its emerſion, or departure out of the ſhadow, at $20^h\ 17^m$ nearly; and laſtly, the fourth has its immerſion on January 11, at $16^h\ 9^m$, and its emerſion at $20^h\ 32^m$, neglecting the ſeconds, which cannot be eſtimated in the orrery.

If, however, theſe calculations are not at hand, or if the time required is paſt, or future, the epochs in the tables will give the times of a mean conjunction, which may be converted readily into an apparent conjunction by applying the equations A, B, C, &c. as given in De Lambre's tables; or the equation A, depending on Jupiter's anomaly, together with the equation for the action of Jupiter in the given year, will ſuffice for our preſent purpoſe, without the application of the minor equations, as may be ſeen in the following ſmall table.

| | 1 Sat. | 2 Sat. | 3 Sat. | 4 Sat. |
|---|---|---|---|---|
| | D. H. M. | D. H. M. | D. H. M. | D. H. M. |
| 1813, Epoch | 0 8 43 | 0 3 25 | 1 12 15 | 11 3 6 |
| Equat. A | 1 51 | 3 8 | 5 43 | 12 35 |
| 1813, 4 | 4 | 9 | 18 | 41 |
| Conjunction | 0 10 38 | 0 6 42 | 1 18 16 | 11 16 22 |

Theſe times of mean conjunction may be turned into apparent times by applying the equation of time as given in the Almanac, and a compariſon of the reſults with the immerſions and emerſions, as given above, will ſhew that the times of conjunction here given are earlier than the emerſions, but later than the immerſions, as they ſhould be, by reaſon of the continuance in the ſhadows reſpectively.

When the lamp is uſed for the ſun, the little paper ſcreen, at the extremity of Jupiter's arm, receives the ſhadows of the ſatellites, as well as of Jupiter himſelf, and the perpetual change taking place in the apparently vibratory motions to the right and left of Jupiter before and after they paſs before his body, or through his ſhadow, affords a pleaſing object of contemplation, while the exact time of each configuration is marked by the ſame hour index that points out the time of any other contemporary

phenomenon, that is taking place in any other place in the ſyſtem, when all the bodies are moving together with their reſpective velocities, mean or equated, as the conſtruction directs. The ring of Saturn muſt be ſet to have an inclination of about 30° with the planet's orbit, and the line of the nodes muſt yearly be put parallel to a diameter of the ecliptic circle taken from $5^s$ 20° 52′ to $11^s$ 20° 52′, in order that a ſpectator at the earth may ſee the ſhape of the opening between the ring and the body of the planet in any year; but when the parallelism of the ring is preſerved by the mechaniſm, frequent adjuſtments are unneceſſary. The planes of all the orbits of Saturn's ſeven ſatellites are nearly parallel to that of the ring, except that of the ſeventh, which is ſuppoſed to make an angle of about 16° with the common plane of the others. The orbits of the ſatellites of Georgian are ſuppoſed to be pretty nearly at right angles with the orbit of the planet, but are perhaps not ſufficiently aſcertained. We mention theſe particulars, becauſe in the common inſtruments the orbits of all the ſecondaries are repreſented as being parallel to the orbits of the primaries, which repreſentation gives a falſe idea of the ſyſtem.

We might laſtly proceed to illuſtrate the various phenomena ariſing out of the relative motions of the different heavenly bodies, by way of exemplifying the uſes of the orrery; but this agreeable exerciſe of our time would involve us in ſuch an endleſs variety of ever varying problems, that a whole volume might be filled in detailing the various combinations of motion, that conſtitute the ſubjects of aſtronomy, dialling, navigation, and geography; and that may be illuſtrated by a proper management of the orrery; particularly when the globe is large enough to admit of a quadrant of altitude to determine by meaſurement the altitudes and azimuths of the ſolar and lunar rays, or luminous points, on the ſurface of the globe, that indicate at all times, when the lamps are uſed, the vertical places of thoſe luminaries, or the places where they would be ſeen through the earth's ſurface, ſuppoſed to be tranſparent, when viewed from the centre of the earth; for as the earth's ſurface is globular, and parallel to the apparent circle of the heavens, any meaſurements of angles, or of angular diſtances, as they regard the circles ſurrounding the earth, will have the ſame reference to theſe luminous points, as actual meaſurements would have of the ſun's and moon's places ſeen in the heavens. Laſtly, when a ſphere, which has not hitherto been mentioned, but which Mr. Pearſon's larger orrery has got, is fixed round the earth, on the tube of parallelism, and has a number of ſtars attached to it, thoſe ſtars continue parallel at all times to the ſame ſtars in the heavens, and the ſolar and lunar rays travel from ſtar to ſtar, in their revolutions, and explain the occultations, and other relative appearances, together with the hour of their occurrence, and places to which they are viſible, in a manner that is truly gratifying.

ORRHAGOGA, formed of ορος, *ſerum*, and αγω, *I draw away*, a name given by the ancients to ſuch medicines as operated violently, as purges, and evacuated ferous and watery humours.

ORRHOPHIGION, a word uſed by anatomical authors, ſometimes to expreſs the extremity of the ſpine, but more frequently the line or ſeam which runs from the penis along the middle of the ſcrotum to the anus.

ORRHOPISSA, a name given by the ancients to the thinner or more fluid parts of tar.

ORRIA, in *Geography*, a town of Spain, in Aragon; 9 miles N. of Teruel.

ORRICE, a name given by the vulgar to the iris root.

ORRINGTON, in *Geography*, a town of America, in Hancock county, Maine, at the head of the tide on the E. ſide of Penobſcot river, oppoſite to the towns of Bangor and Hamden; 32 miles northerly from Caſtine, and containing 785 inhabitants.

ORRIO, El, a town of Spain, in Biſcay; 15 miles S.E. of Bilbao.

ORRON Water, a river of Scotland, which runs into the Frith of Cromarty, at Dingwall.

ORRSVILLE, a town of America, in Grainger county, and ſtate of Tenneſſee; 501 miles from Waſhington.

ORRUS, in *Botany*, a name by which many of the ancients called the cultivated pine-tree, from its being remarkably full of juice.

The firſt perſon who has given us the name is Theophraſtus; but he is followed in it not only by the other Greeks, but alſo by the Latins, who have called the ſame tree for the ſame reaſon *ſapinus*, a contraction or abbreviation of the word *ſapapinus*, the juicy pine. Pliny tells us, that this laſt was the name of the manured pitch-tree; but in this he errs; for Vitruvius, and others, tell us, that the pine nuts, *nuces pineæ*, which were eaten and uſed in medicine, were the fruit of the *ſapapinus*, or *ſapinus*; and it is evident that theſe muſt be the produce of a pine-tree, not of a pitch-tree, or any thing of the fir kind.

ORSARA, in *Geography*, a town of Naples, in Capitanata; 4 miles S. of Troja.

ORSATO, Sertorio, in *Biography*, an eminent antiquarian, was born at Padua in the year 1617. At a very early age he exhibited a great turn for literary and ſcientific purſuits, and occupied himſelf very much in the ſtudy of ancient monuments and inſcriptions. In the latter part of his life he was appointed profeſſor of natural philoſophy in the univerſity of Padua. He died in 1678, leaving behind him many works of great erudition, as well in the Latin as in the Italian language. Of theſe the principal are, "Monumenta Patavina;" "Commentarius de notis Romanorum," a uſeful treatiſe reſpecting the marks and abbreviations uſed by the Romans in their writings and inſcriptions; it was publiſhed in the eleventh volume of the collection of Grævius, and afterwards at Paris in 1723; "Prænomina, Cognomina, et Agnomina antiquorum Romanorum;" "Deorum, Dearumque Nomina et Attributa;" "A Hiſtory of Padua," in the Italian language; alſo, "Poems and Orations," in Italian and Latin. He was a member of various learned ſocieties.

ORSCHA, in *Geography*, a town of Ruſſia, in the government of Mogilev, on the Dnieper; 40 miles N. of Mogilev. N. lat. 54° 30′. E. long. 30° 14′.

ORSERA, a ſea-port town of Iſtria, ſeated on a hill, with a fine harbour, which affords ſhelter in tempeſtuous weather. It is populous, and the reſidence of the biſhop of Parenzo; 4 miles N. of Rovigno.

ORSI, Lelio, in *Biography*, called *Lelio da Novellara*, from the chief place of his reſidence, after being exiled from his native city, Reggio, was by ſome thought to have been a pupil of Correggio, by others of Michael Angelo, becauſe he was contemporary of both, and had ſomething of either in his ſtyle and colour. Little remains of his works, except ſome freſcoes in the ducal palace of Modena, and a copy of the Notte by Correggio, which is preſerved in the palace Gazzola at Verona. He was born in 1511, and died at the age of 76.

Orsi, Francis Joseph Augustine, a learned Italian cardinal, was born in Tuſcany in 1692. In early life he embraced the monaſtic ſtate in the Dominican order, and applied with ſuch ſucceſs to his ſtudies, that he was elected to fill

the chair of theological profeſſor. He was afterwards appointed maſter of the ſacred palace, and at length was promoted to the high dignity of cardinal, by pope Clement XIII., in 1759. In this ſituation he was diſtinguiſhed for modeſty and ſimplicity of manners, and his attention was entirely occupied by his ſtudies, and his zeal for the honour of the church. He died in 1761. He was author of "Infallibilitas Act. Rom. Pontificis," in three vols. 4to., but he is chiefly known to poſterity by his "Eccleſiaſtical Hiſtory," in twenty vols. This work is ſaid to be well written, but is by much too diffuſive: it is in the Italian language.

ORSIERRE, in *Geography*, a town of the Valais; 5 miles S. of Martigny.

ORSINI, Fulvio, in *Biography*, an eminent ſcholar, was born at Rome in 1530. Being an illegitimate child, his education would have been neglected, owing to the diſſentions of his parents, had not the quickneſs of his parts been noticed by a canon of the Lateran, (ſee Lateran,) who took him under his protection, and inſtructed him in claſſical literature. On arriving at years of diſcretion he entered ſucceſſively into the ſervice of ſeveral cardinals of high note, by which means an opportunity was afforded him of collecting a great number of books, eſpecially of ancient manuſcripts, and employing them for the benefit of literature. He was in habits of correſpondence with the moſt eminent literary characters of Italy, and he contributed much valuable aſſiſtance to the authors of that period. He had attained to great ſkill in diſcovering the antiquity and value of MSS., of which he was exceſſively proud. Cardinal Frederic Borromeo, being once in his company, requeſted Orſini to point out from a book that lay before them, the rules by which he diſtinguiſhed ancient from modern manuſcripts; upon this he immediately ſhut the book, and turned the diſcourſe. He died at Rome in the year 1600, at the age of 70: he was author of ſeveral learned works, as "De Familiis Romanis;" and an Appendix to Ciaconio's treatiſe "De Triclinio." He cauſed engravings to be made of a large collection of ſtatues, buſts, and other monuments of antiquity, and publiſhed them under the title of "Imagines et Elogia Virorum illuſtrium et eruditorum ex antiquis lapidibus et numiſmatibus expreſſa, cum annotationibus Fulvii Urſini." In order to keep together the books which, with great labour and at vaſt expence he had accumulated, he bequeathed them to the Vatican. He is ſtyled by De Thou, one of his eulogiſts, "Purioris antiquitatis indagator diligentiſſimus."

Orsini, Gaetano, an Italian vocal performer of the early part of the laſt century, with a counter-tenor voice. The late Joſ. Benda, firſt violin to Frederic II. king of Pruſſia, ſo remarkable for taſte and expreſſion on the violin, confeſſed to us in converſation at Berlin, that in 1723, being at Prague at only 15 years old, when the emperor Charles VI. was crowned king of Bohemia, the excellent ſinging which he then heard was of the utmoſt uſe to him in his ſubſequent ſtudies, and particularly the performance of Gaetano Orſini, a contralto, with which he was beyond meaſure affected.

ORSIO, in *Geography*, a town of Sweden, in the province of Smaland; 20 miles W. of Calmar.

ORSKAIA, a town of Ruſſia in the government of Upha, on the Ural; 132 miles E. of Orenburg.

ORSKAR, a ſmall iſland on the W. ſide of the gulf of Bothnia. N. lat. 60° 32′. E. long. 18° 11′.

ORSOGNA, a town of Naples, in Abruzzo Citra; 9 miles S.E. of Civita di Chieta.

ORSOKO, or Orsaki, a town of Africa, in the diſtrict of Acra, on the Gold Coaſt.

ORSOMORSO, a town of Naples, in Calabria Citra; 9 miles from Scalea.

ORSON'S Island, an iſland in Penobſcot river, at the N. end of Marſh's iſland, containing about 1000 acres. This and Orono take their names from two Indian chiefs, their reſpective proprietors.

ORSOVA, or Orschowa, a fortreſs of Servia, built on both ſides of the Danube; the part on the left of the river, in the bannat of Temeſvar, is called Old Orſova, and was ceded to Auſtria by the peace of Siſtova; and that on the right bank of the river, called New Orſova, belongs to the Turks. This fortreſs was taken by general Laudohn, ſince which time it has been neglected; 75 miles E. of Belgrade. N. lat. 44° 55′. E. long. 21° 56′.

ORSOY, or Orsaw, a town of France, in the department of the Roer, lately belonging to the duchy of Cleves, on the Rhine; 24 miles S.E. of Cleves. N. lat. 51° 38′. E. long. 6° 35′.

ORT, Leer-Ort, or *Oort*, a town of Eaſt Frieſland, at the conflux of the Leer and the Ems; 11 miles S.S.E. of Emden. N. lat. 43° 13′. E. long. 7° 20′.

ORTA, a town of the Patrimonio, on the Tyber, once the ſee of a biſhop, now united to Civita Caſtellana; 12 miles E.N.E. of Viterbo.—Alſo, a town of Italy, in the department of the Gogna, on a lake to which it gives name; 36 miles W.N.W. of Milan.—Alſo, a town of Spain, in Catalonia; 12 miles N.W. of Tortoſa.—Alſo, a town of Naples, in the province of Capitanata; 11 miles N.N.E. of Aſcoli.

ORTAKI, a town of Aſiatic Turkey, in Natolia; 30 miles S.E. of Scala-nova.

OR-TCHELOSCHVEI, a town of Ruſſia, in the government of Kolivan; 16 miles S.E. of Mungatzkoi.

ORTEGAL, a ſmall town of Spain, in Galicia, near cape Ortegal; 13 miles from Corunna.

Ortegal, *Cape*, a cape on the N.W. coaſt of Spain, in the Atlantic ocean. N. lat. 43° 46′. W. long. 7° 55′. This is the extreme point of Spain, or the moſt advanced to the north of this coaſt: it forms a ſection between the Cantabrian ſea and the Atlantic ocean.

ORTEGIA, in *Botany*, a genus, named by Lœfling in honour of the friend and companion of his travels Joſeph Ortega, whoſe nephew Don Caſimiro Gomez de Ortega, M.D. F.R. and L.S. is the preſent profeſſor of Botany at Madrid. Among the publications of this gentleman, which conſiſt of ſeveral botanical tracts, is an account of the plants growing in the Royal Gardens at Madrid, publiſhed in numbers.—Lœfl. It. 112. Linn. Gen. 24. Schreb. 38. Willd. Sp. Pl. v. 1. 190. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 79. Juſſ. 299. Lamarck Dict. v. 4. 635. Illuſtr. t. 29. Gærtn. t. 129.—Claſs and order, *Triandria Monogynia*. Nat. Ord. *Caryophylleæ*, Linn. and Juſſ.

Gen. Ch. *Cal.* Perianth inferior, erect, permanent, of five oval leaves, membranous at their margins. *Cor.* none. *Stam.* Filaments three, awl-ſhaped, ſhorter than the calyx; anthers linear, compreſſed, ſhorter than the filaments. *Piſt.* Germen ſuperior, ovate, triangular at the top; ſtyle thread-ſhaped, almoſt as long as the calyx; ſtigma an obtuſe head. *Peric.* Capſule ovate, triangular in the upper part, of one cell, and three valves at the top. *Seeds* many, very ſmall, oblong, acute at each end.

Eſſ. Ch. Calyx of five leaves. Corolla none. Capſule of one cell. Seeds numerous.

Obſ. Lamarck obſerves that *Ortegia* is chiefly diſtinguiſhed from *Polycarpon* and *Læflingia* becauſe it is deſtitute of a corolla.

1. O. *hiſpanica.* Spaniſh Ortegia. Linn. Sp. Pl. 49. Cavan. Ic. v. 1. 35. t. 47. (Juncarica ſalmanticenſis; Cluſ. Hiſt. v. 2. 174.)—Stem ſquare, branched. Stalks many-flowered. Flowers axillary, ſolitary. This ſpecies was originally obſerved by Cluſius near Salamanca, where it ſtill grows, as well as in various other parts of Spain, flowering in ſummer.—*Root* perennial? round, with branched fibres at the lower part. *Stems* numerous, about a foot long, jointed; the *branches* oppoſite, croſſing each other. *Leaves* oppoſite, ſeſſile, nearly linear, erect, bright green. *Flowers* herbaceous, minute, on ſhort ſtalks, ſo cloſe together as to reſemble a little head.

2. O. *dichotoma.* Forked Ortegia. Willd. n. 2. Allion. Pedem. v. 2. 210. Miſcell. Taurin. v. 3. 176. t. 4. f. 1.—Stem forked, angular. Stalks ſingle-flowered.—Native of Piedmont, and other parts of Italy. It flowers in Auguſt and September. *Root* perennial. *Stem* erect, jointed, ſtraight, roughiſh, furrowed at each end, thickiſh at the joints. *Leaves* oppoſite, linear, ſpreading, by no means ſmooth at the back. *Stipulas* two, between each pair of leaves, minute, briſtle-ſhaped, with a thickiſh, coloured baſe. *Flowers* in forked panicles, of a green colour. The habit of this ſpecies greatly reſembles that of a *Galium*, whilſt its ſtructure is very near that of a *Polycarpon*.

ORTEIL, in *Fortification*. See BERME.

ORTELIUS, ABRAHAM, in *Biography*, a celebrated geographer in the ſixteenth century, was born at Antwerp in the year 1527. He enjoyed the advantage of a good education, and as he had a ſtrong inclination for literature, he made a rapid progreſs in his ſtudies, and particularly excelled in the knowledge of the languages and in mathematics. So great was his ſkill in geographical ſcience, that he obtained the name of the "Ptolemy of the age." With a view to improve himſelf in his favourite ſtudy he travelled into England, Ireland, France, Italy, and Germany, directing his enquiries to every object that was worthy of his attention, and forming a correſpondence and friendſhip with men of learning and ſcience in thoſe countries. He viſited Italy three times, and ſpent ſome time at Oxford in the reign of king Edward VI. In England he formed an intimacy with William Camden, who, at his requeſt, as we are informed in the preface to the work, was engaged to undertake his Britannia. Having furniſhed himſelf with ample ſtores of geographical knowledge, Ortelius ſettled at Antwerp, where, in the year 1570, he publiſhed his "Theatrum Orbis Terrarum," which conſiſted of maps, accompanied with ſhort deſcriptions of the ſeveral countries, and the objects in them particularly intereſting to curioſity. This was the moſt complete work that had ever appeared, and it obtained the author a high reputation: he was almoſt immediately appointed to the poſt of geographer to Philip II. king of Spain. In the various editions called for, it underwent great improvements and enlargements, and in its moſt perfect ſtate, it was publiſhed by John Baptiſt Urientius, in Latin, Spaniſh, and Italian. An epitome or abridgment of this work was publiſhed by Michael Coignet from the Plantin preſs. Ortelius likewiſe publiſhed ſeveral geographical works; among which was one entitled "Synonima Geographica," being a kind of geographical dictionary, containing ſhort deſcriptions, in alphabetical order, of all the countries in the world, the mountains in thoſe countries, iſlands, cities, towns, &c. This work was afterwards greatly enlarged and publiſhed under the title of "Theſaurus Geographicus." In 1584 he publiſhed "Itinerarium per nonnullas Galliæ-Belgicæ partes, Abrahami Ortelli et Joannes Viviani," with engravings; and in 1598 appeared "Aurei Sæculi Imago," containing a deſcription of the manners and religion of the Germans, with illuſtrative plates. Ortelius had collected into a muſeum a conſiderable collection of ancient ſtatues, medals, &c. from which Francis Sweert publiſhed "Deorum, Dearumque Capita," and from the manuſcripts which he left behind him, was publiſhed "Syntagma Herbarum Encomiaſticum." Ortelius died at Antwerp in 1598, in the 71ſt year of his age. Moreri.

ORTELSBURG, in *Geography*, a town of Pruſſia, in the province of Oberland; 68 miles N. of Konigſberg. N. lat. 53° 23′. E. long. 20° 58′.

ORTENAU, a tract of Germany, included between the Briſgau, the marquiſate of Baden, the Black Foreſt, and the Rhine, which, in the diſpoſition of indemnities in 1802, after the peace of Luneville, was adjudged, together with the Briſgau, to the duke of Modena, and ſubſequently to the duke of Baden.

ORTENBERG, a town of Germany, in the county of Hanau Munzenburg, on the Nidder; 17 miles N.E. of Frankfort on the Maine.

ORTENBURG, a town and citadel of Bavaria, which gives name to a county. The count and inhabitants are Lutherans; 10 miles W. of Paſſau.—Alſo, a town and citadel of Carinthia, on the Drave; 32 miles W. of Clagenfurt.—Alſo, a town of Germany, in the Ortenau; two miles S.E. of Offenburg.

ORTH, a town of Auſtria; eight miles E. of Entzerſtorff.

ORTHE'S, a town of France, and principal place of a diſtrict, in the department of the Lower Pyrenées; 30 miles E. of Bayonne. The place contains 6738, and the canton 14,032 inhabitants, on a territory of 192½ kiliometres, in 13 communes. N. lat. 43° 29′. W. long. 0° 42′.

ORTHIA, in *Ancient Geography*, a canton of the Peloponneſus, in Arcadia.

ORTHIA, in *Mythology*, the ſurname of Diana, who had a temple at Lacedæmon.

ORTHIAN. The Orthian nome, in *Greek Muſic*, was a dactylic nome, invented, according to ſome, by old Olympus the Phrygian, and according to others by the Myſian. It was in ſinging this Orthian nome, ſay Herodotus and Aulus Gellius, that Arion precipitated himſelf into the ſea.

ORTHOCERAS, in *Botany*, from ὀρθός, *ſtraight*, and κέρας, *a horn*, a genus of *Orchideæ*, ſeparated by Mr. Brown, Prodr. Nov. Holl. v. 1. 316. from *Diuris*, on account of the more ringent *flower*, whoſe two lower calyx-leaves are ſtraight and its petals diminutive and cohering. The only ſpecies is

O. *ſtrictum*, a native of Port Jackſon, New South Wales. The *bulbs* are undivided. We are inclined to refer this plant to DIURIS; ſee that article.

ORTHOCERATITES, in *Natural Hiſtory*, a name by which ſome authors have called a ſpecies of ſea-ſhell, found frequently foſſile, but not known at preſent in its recent ſtate; called by others polythalamium, and tubulus marinus concameratus. It is uſually ſtraight, but ſometimes its end is twiſted like the cornu ammonis. See TUBULI *Concamerati*.

ORTHOCOLON, from ὀρθός, *ſtraight*, and κῶλον, *a limb*. See ANCHYLOSIS.

ORTHODORON, ὀρθόδωρον, an ancient Greek long meaſure; being the ſpace from the carpus, or wriſt, to the tips of the fingers, rated at eleven inches.

ORTHODOXY, formed from ὀρθός, *right*, and δόξα, *opinion, judgment*, a ſoundneſs of doctrine or belief, with regard to all the points and articles of faith.

According to the proper etymology of the word, orthodoxy

doxy denotes what every honeſt man believes his own opinions to be, in contradiſtinction to the opinions of others, which he rejects. In England it is vulgarly reſtricted to ſignify the opinions contained in the thirty-nine articles; and in Scotland, it is in like manner uſed to denote the doctrines contained in their confeſſion of faith. It is, in general, applied to the opinions that are maintained by thoſe called Calviniſts.

Orthodoxy is uſed in oppoſition to *heterodoxy*, or *hereſy*.

ORTHODOXY, or *Feaſt of Orthodoxy*, denotes a ſolemn feaſt in the Greek church, inſtituted by the empreſs Theodora; ſtill held on the firſt Sunday in Lent, in memory of the reſtoration of images in churches, which had been taken down by the Iconoclaſts.

ORTHODROMICS, that part of navigation which teaches the art of ſailing in the arc of ſome great circle.

The word is Greek, ὀρθοδρομικα, derived from ὀρθος, *rectus*, *ſtraight*, and δρομος, *curſus*, *run*, or *diſtance*; *q. d.* the ſtraight or ſhorteſt diſtance; and this can only be in the arc of a great circle.

ORTHOEPY, formed of ὀρθος, *right*, and επος, *word*, in *Grammar*, denotes the juſt utterance of words. For pronunciation the beſt rule is, ſays Dr. Johnſon, to conſider thoſe as the moſt elegant ſpeakers, who deviate leaſt from the written words. See PRONUNCIATION.

ORTHOGONIAL, ORTHOGONIUS, in *Geometry*, denotes as much as rectangular or right-angled.

When the term is referred to a plain figure, it ſuppoſes one leg or ſide to ſtand perpendicular to the other: when ſpoken of ſolids, it ſuppoſes their axis to be perpendicular to the plane of the horizon.

ORTHOGRAPHIC *Projection of the Sphere*. See PROJECTION.

ORTHOGRAPHY, formed from ὀρθος, *right*, and γραφη, *writing*, in *Grammar*, the art of ſpelling; that is, writing words juſtly, and with all the proper and neceſſary letters. Or it is the art of combining letters into ſyllables, and ſyllables into words: or, more generally, it teaches the nature and powers of letters, or the form and ſound of letters, and the juſt method of ſpelling words. Accordingly orthography makes one of the four principal diviſions or branches of grammar: the other three being *etymology*, *ſyntax*, and *proſody*; which ſee reſpectively. Orthography, conſidered as the art of expreſſing certain ſounds by proper characters, may be ſuppoſed to include *orthoepy*; which ſee.

That diverſity found in moſt of the modern languages, eſpecially the Engliſh and French, between the pronunciation and orthography, makes one of the principal difficulties in acquiring them; nevertheleſs it ariſes from the ſame ſource as the languages themſelves.

The Gauls, *e. gr.* forming a new language from the ancient Latin, took the liberty to model the words to their fancy: at firſt, indeed, it is probable they wrote as they pronounced; but, by degrees, finding that words pronounced with all their letters ſounded harſh, they began to pronounce more ſmoothly.

Thus, in ſpeaking, they thought fit to ſoften that harſhneſs reſulting from the concurrence and claſhing of conſonants; but as the orthography, or writing, did not offend the ear, it ſtill continued on its former footing.

Attempts have been ſince made to reduce the writing to that pronunciation, or to make us write as we ſpeak; which has occaſioned great diſputes. Pelletier of Mans was the firſt who pleaded for the change of orthography; and after him Maigret, Peter Ramus, De Bois, Menage, and others; but in vain.

They have, however, occaſioned a ſchiſm among writers, which has done more harm than the evil they intended to reform, the French writers being ſince divided into two parties; one of which adheres to the *old*, the other to the *new* orthography. The latter, F. Buffier obſerves, is the moſt conſiderable body; yet are theſe divided among themſelves, ſome being for carrying the reformation much farther than others.

The chief matters urged in behalf of the ancient orthography are, that by changing it we ſhould loſe ſight of the origin and etymology of words borrowed from the Greek and Latin, &c. That it does not matter what characters are uſed to expreſs ſounds in writing, provided one knows the relation between thoſe characters and the ſounds they repreſent; that by a neceſſary conſequence of ſuch change, the language would, in time, be all altered, and we ſhould loſe the uſe of our old authors; as ours, in their turn, would likewiſe become unintelligible.

What is alleged for the new orthography is, its being more commodious, natural, eaſy, ſhort, &c.

Some authors take a middle courſe between the two extremes, retrenching the letters where they are abſolutely uſeleſs, as the *s* in a multitude of words; and yet ſtudiouſly retaining all the letters on which the etymology has any dependence.

In the Engliſh, the orthography is more vague and unaſcertained than in any other language with which we are acquainted. Every author, and almoſt every printer, has his particular ſyſtem; nay, it is ſcarcely ſo well with us as that: we not only differ from one another, but there is ſcarcely any one that is conſiſtent with himſelf. The ſame word ſhall frequently appear with two or three different faces in the ſame page, not to ſay line. See ENGLISH.

Many ſchemes have been propoſed for the emendation and ſettlement of the Engliſh orthography, which, like that of other nations, being formed by chance, or according to the fancy of the earlieſt writers in rude ages, was at firſt very various and uncertain, and is yet ſufficiently irregular. Of theſe reformers, ſays Dr. Johnſon, ſome have endeavoured to accommodate orthography better to the pronunciation, without conſidering that this is to meaſure by a ſhadow, to that for a model or ſtandard which is changing while they apply it. Others, leſs abſurdly indeed, but with equal unlikelihood of ſucceſs, have endeavoured to proportion the number of letters to that of ſounds, that every ſound may have its own character, and every character a ſingle ſound. Such would be the orthography of a new language to be formed by a ſynod of grammarians upon principles of ſcience. But who can hope to prevail on nations to change their practice, and make all their old books uſeleſs? Or what advantage would a new orthography procure equivalent to the confuſion and perplexity of ſuch an alteration? Some of theſe ſchemes are exhibited by our learned lexicographer, which, he ſays, may be uſed according to the diverſities of genius, as a guide to reformers, or terror to innovators. One of the firſt who propoſed a ſcheme of regular orthography was ſir Thomas Smith, ſecretary of ſtate to queen Elizabeth, a man of real learning, and much practiſed in grammatical diſquiſitions. After him another mode of writing was offered by Dr. Gill, the celebrated maſter of St. Paul's ſchool in London. Dr. Gill, in his work entitled "Nature and Properties of Bees, 1634," was followed by Charles Butler, a man who did not want an underſtanding which qualified him for better employment. In the time of Charles I., there was a very prevalent inclination to change the orthography: as appears, among other books, in ſuch editions of the works of Milton as were publiſhed by himſelf. Of theſe reformers, every man had his own

ſcheme: but they agreed in one general deſign of accommodating the letters to the pronunciation, by ejecting ſuch as they thought ſuperfluous. Some of them would have written theſe lines thus:

" ——————— All the erth
Shall then be paridis, far happier place
Than this of Eden, and far happier dais."

Biſhop Wilkins afterwards, in his great work of the philoſophical language, propoſed, without expecting to be followed, a regular orthography, by which the Lord's prayer is to be written thus:

" Yŭr Fâdher hŭitſh art in héven halloĕd bi dhyi nám, dhyi cingdȳm cȳm, dhy will bi dȳn in erth az it iz in héven, &c."

We have ſince had no general reformers; but ſome ingenious men have endeavoured to deſerve well of their country, by writing *honor* and *labor*, for *honour* and *labour*, *red* for *read* in the preter tenſe, *ſais* for *ſays*, *repete* for *repeat*, *explane* for *explain*, and *declame* for *declaim*. Of theſe it may be ſaid, that as they have done no good, they have done little harm; both becauſe they have innovated little, and becauſe few have followed them.

A popular grammarian, after obſerving that the orthography of the Engliſh language is attended with much uncertainty and perplexity, ſuggeſts, that a conſiderable part of this inconvenience may be remedied, by attending to the general laws of formation; and for this end he preſents the reader with a view of ſuch general maxims, in ſpelling primitive and derivative words, as have been almoſt univerſally received. But as his valuable work is in almoſt every one's hands, we ſhall content ourſelves with referring to it. See Murray's Engliſh Grammar, ed. 2. 1809, vol. i. p. 56, &c.

The orthography of a great number of Engliſh words is very far from being fixed and uniform even among writers of diſtinction and in the beſt modern publications. It would therefore be extremely deſirable to have a generally approved and authoritative ſtandard, which might ſerve as a directory to the doubtful, and as a kind of teſt for deciding differences that occur in this department of grammar. The celebrated dictionary of Dr. Johnſon has occupied, and not without a very general conceſſion, this diſtinguiſhed rank in literature; and yet ſome few of his deciſions appear to be unwarranted by the principles of etymology and analogy. Of this dictionary, Dr. Nares, in his "Elements of Orthoepy," expreſſes a very high opinion, obſerving, that it has nearly fixed the external form of our language. He adds, "indeed, ſo convenient is it to have one acknowleged ſtandard to recur to; ſo much preferable, in matters of this nature, is a trifling degree of irregularity, to a continued change, and fruitleſs purſuit of unattainable perfection; that it is earneſtly to be hoped, that no author will henceforth, on light grounds, be tempted to innovate." Nevertheleſs, Mr. L. Murray has very juſtly obſerved, that this dictionary contains ſome orthographical inconſiſtencies, that ought to be rectified; and that if theſe, and ſimilar irregularities, were corrected, by ſpelling the words analogically, according to the firſt word in each part of the ſeries, and agreeably to the general rules of ſpelling, the dictionary would doubtleſs, in theſe reſpects, be improved. Such a work, on the plan of that of Dr. Johnſon, with neceſſary corrections and additions, is one of the deſiderata in Engliſh literature; and it is much to be regretted, that the undertaking has not yet been duly encouraged.

The ancients, who have written treatiſes of orthography, are Velius Longus, Marius Victorinus, Flavius Caper, Caſſiodorus, and Beda. Among the moderns, Torelli, Lipſius, Dauſquius, Scoppa, Valla, and Manutius the younger, have treated on the ſame ſubject.

ORTHOGRAPHY, in *Geometry*, is the art of drawing, or delineating the fore-right plan or ſide of any object, and of expreſſing the heights or elevations of each part.

It is called orthography, from the Greek ὀρθος, *right*, and γραφη, *deſcription*, from its determining things by perpendicular right lines falling on the geometrical plan; or rather, becauſe all the horizontal lines are here ſtraight and parallel, and not oblique, as in repreſentations of perſpective.

ORTHOGRAPHY, in *Architecture*, is the elevation of a building, ſhewing all the parts thereof in their true proportion. The orthography is either *external* or *internal*.

ORTHOGRAPHY, *External*, is a delineation of the outer face or front of a building, exhibiting the principal wall, with its apertures, roof, ornaments, and every thing viſible to an eye placed before the building.

ORTHOGRAPHY, *Internal*, called alſo *ſection*, is a delineation, or draught of a building, ſuch as it would appear, were the external wall removed. See PERSPECTIVE.

ORTHOGRAPHY, in *Fortification*, is the profile, or repreſentation of a work; or a draught ſo conducted, as that the length, breadth, height, and thickneſs, of the ſeveral parts are expreſſed; ſuch as they would appear, if it were perpendicularly cut from top to bottom.

ORTHONA, in *Mythology*, a divinity worſhipped at Athens, in the manner of that of Priapus.

ORTHOPNŒA, in *Medicine*, compounded of ὀρθος, *ſtraight*, *erect*, and πνεω, *I breathe*, ſignifies that extreme difficulty of reſpiration, which compels the patient to ſit upright in order to be able to perform the function of breathing. Orthopnœa, therefore, is not a diſtinct diſeaſe, but merely an extreme ſtate of *dyſpnœa*, and a ſymptom of ſeveral different diſeaſes.

The reaſon why the erect poſture is choſen, or becomes neceſſary in certain caſes of extreme difficulty of breathing, will be obvious, if we attend to the mechaniſm of reſpiration, and to the circumſtances under which orthopnœa occurs. The lungs occupy and completely fill (in a ſtate of health) the cavity of the cheſt, which is bounded by a caſe of bone (the ribs) and muſcle, and ſeparated from the belly, internally, by a muſcular curtain (the diaphragm). Now the act of breathing is performed by the enlargement of this cavity, when the external air immediately paſſes in, by the wind-pipe, to ſupply the vacuum, that would otherwiſe be produced; and this enlargement or expanſion of the cavity is effected partly by the elevation of the ribs, which move outwards as well as upwards, and partly by the contraction of the arch of the diaphragm downwards. In ordinary health, we can breathe by either of theſe modes; for it is not neceſſary to diſtend the lungs completely at each reſpiration. But when, from any cauſe, the acceſs of air into the lungs in ſufficient quantity is impeded, it then becomes neceſſary to employ every means of expanding the thorax, and obtaining a ſufficiency of the vital fluid. Now it muſt be obvious, that, in a ſupine poſture, not only the free motion of the ribs, on which the patient lies, but alſo the deſcent of the diaphragm, will be impeded, by the preſſure of the abdominal viſcera againſt it; ſo that if, with all the mechanical circumſtances in his favour, he is unable to obtain a ſufficient portion of air to carry on the function of the lungs, he will neceſſarily be reduced to extreme diſtreſs, when that ſupply is farther diminiſhed by the mechanical diſadvantages of a recumbent poſition; and he will, therefore, be compelled to aſſume the erect poſture, in which

which the gravity of the abdominal viſcera will aſſiſt the deſcent of the diaphragm, and the motion of the ribs will be free.

Orthopnœa is produced in the manner juſt deſcribed under all circumſtances, which greatly impede the act of reſpiration: theſe are, for inſtance, peripneumony, or inflammation of the lungs, eſpecially when that diſeaſe is ſevere and dangerous; ſpaſmodic aſthma, while the paroxyſm laſts, and the bronchial paſſages are contracted; the humoral aſthma, as it has been called, in which the cells and tubes are obſtructed by a congeſtion of mucus; and empyema, or abſceſs in the lungs, dropſy in the cheſt, tumours, and every other ſource of diminution of the cavity of the thorax. In ſome of the circumſtances laſt mentioned, namely, when a fluid is effuſed into the cavity of the cheſt, *i. e.* between the lungs and the *parietes* of that cavity, there is an additional reaſon for the occurrence of orthopnœa. When an abſceſs of the lungs breaks, and diſcharges its matter into the cavity, when the lungs are wounded, and blood is diſcharged in like manner, or when water is effuſed into the ſac of the *pleura*, theſe fluids neceſſarily gravitate to the moſt depending part, and therefore, when the body is in a ſupine poſition, they preſs upon the upper part of the lungs, and compreſs the bronchial paſſages; but, when the body is erect, they tend to preſs the diaphragm downwards, leaving the air-paſſages free, and conducing to the expanſion of the cavity.

One practical obſervation, deduced from theſe conſiderations, is of importance. An ordinary obſerver is liable to imagine, that a perſon, chooſing to ſit up, and ſhunning his bed, cannot be ſo ill as to be near death. But in the moſt acute peripneumony, it will ſometimes happen, that a patient will be found thus ſitting by the fire, within an hour or two of his deceaſe, becauſe he *cannot* lie down, a ſituation of the utmoſt danger. See PERIPNEUMONY, and DYSPNŒA.

ORTHOPOGON, in *Botany*, from ορθος, *ſtraight*, and πωγων, *a beard*, a genus of graſſes, eſtabliſhed by Mr. Brown, Prodr. Nov. Holl. v. 1. 194. It is diſtinguiſhed from *Panicum* merely on account of the nearly equal ſize of the calyx-valves, the outermoſt of which has a longer awn than the other; and more eſpecially on account of the ſmoothneſs or evenneſs of all the awns. The ſpecies are all tropical graſſes, growing in ſhady places. Their *leaves* flat and broadiſh. *Spike* compoſed of alternate ſpikelets, directed all one way, and ſometimes conſiſting of very few *flowers*. Four ſpecies are found in New Holland, *O. compoſitus*, *æmulus*, *flaccidus* and *imbecillis*. The firſt is *Panicum compoſitum* of Linnæus. Mr. Brown indicates two more graſſes as belonging to this genus, *P. hirtellum* of Linnæus, and *P. Burmanni* of Retzius. See PANICUM.

ORTHOSIA, or OR-TOSA, in *Geography*, a town of Syria, in the pachalic of Tripoli, on the coaſt of the Mediterranean; 12 miles N.E. of Tripoli. Conſiderable ruins indicate the ſcite of this ancient town, which was a place of conſequence, becauſe it commanded the paſs between Phœnicia and the maritime parts of Syria. It was ſituated to the right of the river Eleutherus, in the vicinity of that of Simyra. N. lat. 34° 47′. E. long. 35° 50′.

ORTHOSTEMON, in *Botany*, from ορθος, *ſtraight*, and στημων, *a ſtamen*. Brown Prodr. Nov. Holl. v. 1. 451.—Claſs and order, *Tetrandria Monogynia*. Nat. Ord. *Gentianæ*, Juſſ.

Eſſ. Ch. Calyx tubular, four-toothed. Corolla with a ſhort, deeply four-cleft limb, and naked mouth, withering. Stamens equal, prominent. Anthers burſting lengthwiſe, pointleſs, always ſtraight. Stigmas two, roundiſh.

A genus of flaccid *herbs*, with broadiſh *leaves*, and terminal *flowers*; which its author doubtfully ſeparates from *Canſcora* of Lamarck, and from his own *Erythræa*. This laſt includes the *Chironiæ* of Fl. Brit. though perhaps it may be properly ſeparated from the *Chironia* of Linnæus, an African ſhrubby genus.

ORTHOTRICHUM, from ορθος, *ſtraight* or *erect*, and θριξ, *a hair*, which appellation alludes to the hairs that, in moſt ſpecies, clothe the *calyptra* or veil in this very natural genus of moſſes, and whoſe erect poſition is directly the reverſe of what is obſervable in the hairy veil of *Polytrichum*. Hedw. Crypt. v. 2. 96. Swartz Act. Holm. for 1795. 247. Sm. Fl. Brit. 1262. Turn. Muſc. Hib. 92. Sims and Kon. Ann. of Bot. v. 2. 242. 532. (Weiſſia; Ehrh. Beitr. v. 1. 33. Schreb. 760.)—Claſs and order, *Cryptogamia Muſci*. Nat. Ord. *Muſci*.

Eſſ. Ch. Capſule oblong, terminal. Outer fringe of ſixteen teeth; inner of eight or ſixteen thread-ſhaped teeth, ſometimes wanting. Veil angular, moſtly clothed with erect hairs.

However natural this genus may be in habit, its character, as far as reſpects the inner fringe, is liable to the wideſt exceptions. Nor is the character of the hairy veil abſolutely conſtant, ſome ſpecies wanting that mark, though the ſtructure and aſpect of their veil are ſo preciſely ſimilar to others, which are hairy, that nothing ought to disjoin them. On the other hand, the genera of *Pterogonium* and *Neckera* have a veil often clothed with the erect hairs of *Orthotrichum*; but in theſe the fructification is axillary, and the veil cylindrical, not angular. The late Dr. Mohr, whoſe loſs cannot be too much lamented by cryptogamic botaniſts, has attempted to remove ſome of the difficulties above mentioned, by the eſtabliſhment of a new genus, called *Ulota*, from ουλος, *criſped*, which contains *Orthotrichum criſpum*, amongſt other ſpecies. In this he defines the veil as furniſhed with prominent ridges, whereas it has furrows in *Orthotrichum*. In the former the intermediate linear ſpaces are depreſſed channels, in the latter they are acute projecting edges or angles. The ridges of *Ulota* are often cloven at their baſe; ſo are the furrows of *Orthotrichum*, which proves their analogy. A tranſverſe ſection of either is a ſegment of a circle. (See ULOTA.) The teeth in the outer fringe of ſome genuine ſpecies of *Orthotrichum* are combined in pairs, but there is always a line of diſtinction to indicate this union, though to a ſlight obſerver the teeth may ſeem to be but eight.

*Orthotrichum* is divided into two ſections, the firſt comprehending ſuch ſpecies as have the proper double fringe of the genus; the ſecond ſuch as want the internal fringe.

Inſtances of the former are

O. *ſtriatum*. Common Briſtle-moſs. Hedw. Sp. Muſc. 163. Crypt. v. 2. 99. t. 36. Engl. Bot. 2187. (Bryum ſtriatum; Linn. Sp. Pl. 1579, α. Polytrichum ſtriatum; Hudſ. 471, α. P. bryi ruralis facie, capſulis ſeſſilibus, majus; Dill. Muſc. 430. t. 55. f. 8.)—Stem branched. Leaves lanceolate, keeled, revolute, ſpreading. Veil entire. Inner fringe of ſixteen teeth.—Not rare on the trunks of old trees, bearing capſules from February to May. Few ſpecies are ſo complete in the technical generic characters, for this has not only a hairy *veil*, but the outer fringe conſiſts of ſixteen diſtinct teeth, the inner of as many white, inflexed, linear, flat, jointed, jagged ones, more like ſcales than briſtles. The *ſtems* are perennial, tufted, branched, an inch or two high, clothed with crowded, ſpreading, lanceolate, acute, pointleſs, entire, revolute, ſingle-ribbed, dark-green *leaves*, the upper ones paleſt, more expanded, ſometimes jagged at the end. *Capſules* ſolitary, at the ends

of lateral ſhoots, projecting a little beyond the leaves, furrowed in the upper part when ripe, each on a very ſhort *fruit-ſtalk*. *Lid* ſhort, with a blunt, conical, ſhort point, cylindrical when dry, the edge crimſon. *Veil* partially covered with yellow vertical hairs. *Anthers* in axillary tufts, on a ſeparate plant.

O. *affine*. Pale Straight-leaved Briſtle-moſs. Schrad. Spicil. 67. Sm. Fl. Brit. n. 2. Engl. Bot. t. 1323. (Polytrichum capſulis ſeſſilibus, foliis brevibus rectis carinatis; Dill. Muſc. 432. t. 55. f. 10?)—Stem branched. Leaves lanceolate, keeled, revolute, ſpreading. Veil ſlightly crenate. Inner fringe of eight teeth.—More frequent perhaps than the foregoing, on rocks, old walls, cottage roofs, &c. It differs from that ſpecies in having paler *leaves*, a *fruit-ſtalk* more elongated as it grows older, *capſule* twiſted when ripe, but eſpecially an inner *fringe* of only eight teeth, or rather ſimple inflexed briſtles, not jointed except when very old.

O. *pulchellum*. Elegant Smooth Briſtle-moſs. Engl. Bot. t. 1787.—Stem ſomewhat branched. Leaves lanceolate, keeled, revolute, beardleſs, ſlightly twiſted when dry. Inner fringe of ſixteen briſtles. Capſule with eight furrows. Veil naked.—Found by Mr. Winch and Mr. Thornhill, on trees in various parts of the county of Durham, ſince the publication of Fl. Brit. The *ſtems* form tufts, not half an inch high. *Leaves* bright green, lanceolate, acute, beardleſs, ſingle-ribbed; ſlightly twiſted, not curled, by drying. *Fruit-ſtalks* elongated, conſpicuous above the leaves, twiſted and yellowiſh when full-grown. *Capſule* pale when ripe, with eight furrows, and as many intermediate ridges. Outer *fringe* of ſixteen elegant red teeth, partly combined in pairs; inner of ſixteen very ſlender pale briſtles, meeting by their points. *Veil* crenate at the baſe, deſtitute of hairs.

There are four more of this ſection natives of Britain, O. *pumilum*, Engl. Bot. t. 2168; *diaphanum*, t. 1324; *ariſtatum*. Turn. Muſc. Hib. t. 9. f 2. (which is *diaphanum* of Dickſon); and *rivulare*, Engl. Bot. t. 2188. The three laſt have the full number of teeth to their inner *fringe;* the firſt has only eight. They all grow on trees or pales, and bear a general reſemblance to each other, except that *diaphanum* and *ariſtatum* have hoary points to their *leaves*.

O. *criſpum*, Fl. Brit. n 7. Engl. Bot. t. 996, belongs to the new genus *Ulota*, as above mentioned.

Species with a ſingle or outer fringe only, are

O. *anomalum*. Rough Single-fringed Briſtle-moſs. Hedw. Sp. Muſc. 162. Crypt. v. 2. 102. t. 37. Engl. Bot. t. 1423. (Bryum ſtriatum $\beta$; Linn. Sp. Pl. 1580. Polytrichum bryi ruralis facie, capſulis ſeſſilibus, minus; Dill. Muſc. 431. t. 55. f. 9. Weiſſia minor; Ehrh. Crypt. 282.)—Stem branched. Leaves lanceolate, keeled, revolute. Fringe ſimple. Veil hairy, toothed.—Common on rocks, ruins and ſtones, bearing fruit early in ſpring. The colour of the *leaves* is a dull browniſh-green, and their edges are revolute. Though this ſpecies has no internal *fringe*, its *veil* anſwers to the character and name of the genus better than ſome of the former, being very hairy, till it becomes bald by age.

O. *nudum*, Engl. Bot. t. 1325, found on poſts in ſhady places near rivers, is the only Britiſh ſpecies, of this ſection, beſides. This is of a very dark hue, and has no hairs upon the *veil*.

O. *Brownianum*, Fl. Brit. n. 10. (Grimmia Browniana; Engl. Bot. t. 1422), a minute and very curious moſs, is now found to have but four teeth to its fringe, which, in the ſpecimens Mr. Sowerby drew, was ſo imperfect as to miſlead his uſually very accurate obſervation. This plant therefore ranges in the genus TETRAPHIS; ſee that article hereafter, as well as FRINGES *of Moſſes*.

ORTHRAGORISCUS, in *Ichthyology*, the name uſed by Rondeletius, and ſome other authors, for the fiſh more commonly known by the name of the mola, and called in Engliſh the *ſun-fiſh*. See TETRODON *Mola*.

ORTI, in *Geography*, a town of Italy, in the Patrimonio, the ſee of a biſhop, united to Caſtellana; 12 miles E. of Viterbo.

ORTIBARIO, a town of the iſland of Corſica; 12 miles S. of Pellegrino.

ORTIEN, the Ortian nome, or air for a flute of a very acute tone, and full of life and fire; which by animating the combatants rendered it of great uſe in war.

ORTIGOSA, in *Geography*, a town of Spain, in Old Caſtile; 14 miles S. of Logrono.

ORTIVE, ORTIVUS, in *Aſtronomy*. *Ortive*, or *eaſtern amplitude*, is an arc of the horizon intercepted between the point where a ſtar riſes, and the eaſt point of the horizon, or point where the horizon and equator interſect. See AMPLITUDE.

ORTO, in *Geography*, a town of Chineſe Tartary; 50 miles W. of Hami. N. lat. 43° 46′. E. long. 92°44′.

ORTOLAN, in *Ornithology*. See EMBERIZA.

ORTON, JOB, in *Biography*, an eminent nonconformiſt divine, was born at Shrewſbury in the year 1717, where he received part of his education, which was completed under the celebrated Dr. Doddridge at Northampton. He had ſcarcely finiſhed the courſe of his ſtudies, when he was appointed aſſiſtant tutor in the academy. In this capacity he paſſed ſome years, and then ſettled as diſſenting miniſter at Shrewſbury, his native town. He preached his firſt ſermon here in 1741, and was ordained in the following year, and ſo highly was he reſpected by his brethren, that thirty miniſters were preſent at the ſervice. In 1748 his health was ſo bad, that he was obliged to ſeek for an aſſiſtant to eaſe him of part of his labours. Mr. Fownes was the perſon fixed on, and with him Mr. Orton lived in the utmoſt harmony and friendſhip till the year 1765, when he reſigned the paſtoral office, and in the following year he removed to Kidderminſter, in order that he might benefit by the advice of Dr. Johnſtone, an able and ſkilful phyſician, who was alſo his intimate acquaintance and friend. Here Mr. Orton ſpent the remainder of his days zealouſly intent on promoting the intereſts of religion. What he could not perform as a preacher, he was ſolicitous to effect as a practical writer. His works are the "Life of Dr. Doddridge;" "Sermons to the Aged;" "Three Sermons on Eternity;" which are exceedingly impreſſive, and have been tranſlated into the Welſh language; "Three Sermons on Chriſtian Zeal;" "Three Sermons on Chriſtian Worſhip;" and ſome ſingle diſcourſes. Mr. Orton publiſhed alſo a volume of ſermons with the title of "Religious Exerciſes recommended, or Diſcourſes on the heavenly State, conſidered under the Idea of a Sabbath;" "Diſcourſes on Practical Subjects," in two vols.; "Sacramental Meditations, or, Devout Reflections on various Paſſages of Scripture, deſigned to aſſiſt Chriſtians in their Attendance on the Lord's Supper, and their immediate Improvement of it." This was his laſt publication. He died in the year 1783, and after his death was printed his "Practical Expoſition of the Old Teſtament," in ſix vols. 8vo., which probably did not anſwer the public expectations formed of it; and a ſmall collection of "Letters to a young Clergyman," which had been addreſſed to the Rev. Thomas Stedman, the editor, and which contained advice, that is, in general,



well

well adapted for the direction and improvement of the younger clergy of every denomination.

ORTON, or *Overton*, in *Geography*, a market town and parish in the East Ward, county of Westmoreland, England, is situated in a bleak, open country, at the distance of 9¼ miles S.W. by S. from Appleby, and 275¾ N.W. by N. from London. The town is of very trifling importance, and chiefly inhabited by farmers, engaged in the cultivation of the small tract of fertile ground by which it is immediately surrounded. The church here is a large, ancient edifice, with a tower at one end. Dr. Burn, author of "The Justice of the Peace," and one of the editors of the "History and Antiquities of Westmoreland and Cumberland," was vicar of Orton upwards of thirty years. Here are two free-schools. The market is held on Friday, every week, and there are two fairs during the year. According to the population returns of 1811, this parish contains 292 houses and 1333 inhabitants. A Topographical Description of Cumberland, Westmoreland, Lancashire, &c. by John Housman, 8vo. 1800.

ORTONA, in *Ancient Geography*, a town and port of Italy, in Samnium; it belonged to the people called Frentani, according to Strabo.

ORTONA *a Mare*, in *Geography*, a sea-port town of Naples, in Abruzzo Citra; the see of a bishop, united with Campali; 13 miles E. of Civita di Chieti. N. lat. 42° 20′. E. long. 14 20′.

ORTORI, a town of Japan, in the island of Niphon; 15 miles S. of Idsami.

ORTOSTA, a town of Sweden, in the province of Schonen; five miles N. of Lund.

ORTRAND, a town of Saxony, in the margraviate of Meissen; 22 miles N. of Dresden.

ORTYGIA, in *Ancient Geography*, a small island on the E. coast of Sicily, before Syracuse, and at the mouth of the river Alpheus. Virgil mentions it in the Æneid, l. iii. v. 124. This island, on which Syracuse was founded and situated between its two ports, was always very important. See SYRACUSE.

ORTYGOMETRA, DAKER-HEN, in *Ornithology*. See RALLUS *Crex*.

ORVAL, in *Geography*, a town of France, in the department of the Forests; five miles N. of Montmedy.

ORVALA, or ORVALLA, in *Botany*, an old name for Clary, *Salvia Sclarea*, and other species of the same genus, adopted by Dodonæus. Linnæus applies it to a species of LAMIUM; see that article.

ORUBA, in *Geography*. See ARUBA.

ORUENNY, a town of Hindoostan, in Dowlatabad; 15 miles N.N.W. of Darore.

ORVIETA, *Penitents of*. See PENITENTS.

ORVIETAN, a celebrated antidote or counter-poison; so called, because invented, and originally sold, by an operator from Orvieta, in Italy, who made experiments of it on his own person, on the public stage, by taking several doses of poisons.

In Charas's Pharmacopeia is a method of making Orvietan; where it appears, that Venice treacle is one of the principal ingredients of it.

ORVIETO, in *Geography*, a city of Italy, and capital of a province, called the "Orvietan," the see of a bishop, situated at the conflux of the Paglia and the Chiana. The cathedral is a fine Gothic building, and contains some good sculptures and paintings. The country of Orvietan is about 20 miles long, and from 10 to 15 wide; 73 miles S.S.E. of Florence. N. lat. 42° 42′. E. long. 12° 3′.

ORVILLE, JAMES PHILIP D', in *Biography*, was born at Amsterdam in 1696, of a family originally from France. From early life he shewed an ardent attachment to letters, and afterwards travelled into various parts of Europe, visiting the libraries and cabinets and forming connections with learned men; and upon his return, in 1736, he was appointed professor of history, eloquence, and the Greek language at Amsterdam. The duties of this office he performed with high reputation about six years, when he resigned it, in order to devote himself wholly to study and literary composition. In conjunction with Burmann, he continued a work, which had been begun by some learned Englishmen, entitled "Observationes Miscellaneæ Novæ," and ten volumes of it were published by them jointly, and four others were published by d'Orville separately. Some pieces of his own writing are contained in this collection, among which are "A Dissertation on the Antiquity of the Isle of Delos," and "Remarks on the Greek Romance of Chariton." He was likewise author of a learned and severe critique upon Pauw of Utrecht. He died in 1751, and after his death were published his observations on Sicily under the title of "Siculæ." Gen. Biog.

ORUM, in *Geography*, a town of Denmark, in North Jutland; 11 miles S.W. of Tysted.

ORURILLO, a town of Peru, in the diocese of La Paz, on lake Titicaca; 25 miles N.W. of Asangaro.

ORURO, a jurisdiction of Peru, in the government of Buenos Ayres, and archbishopric of La Plata. The climate is cold, so that no vegetable will flourish; but its herds are numerous, and it has been long famous for its gold and silver mines. The former have not long since been wrought, and the latter have declined. Oruro, the capital, has, according to Alcedo, five convents and four parish churches.

ORUROS, GORUR, in *Ancient Geography*, a town of Asia, in Syria, on the banks of the Euphrates; S. of Auzara, and 250 miles from Zeugma. In the time of Pompey, it was on this side the boundary of the Roman empire.

ORUS, or HORUS, in *Mythology*, a famous deity of ancient Egypt, which, as well as Osiris, was an emblem of the sun. To this purpose Plutarch says, that virtue, which presides over the sun, whilst he is moving through space, the Egyptians called Horus, and the Greeks Apollo. The veneration in which this deity was held in Egypt appears from the circumstance of three cities having been called by this name in the Thebais. The sparrow-hawk was the common emblem of Osiris and Horus, and both had sometimes the same attribute. According to the interpretation of the hieroglyphics of Heliopolis, Horus is the supreme lord and the author of time, and this evinces the propriety of representing him as the star of the day, or the sun. The Egyptians describe him under the appellation of Horapollo, as borne on lions, thus signifying his entrance into the sign of the zodiac, called the lion. Macrobius, who informs us why the Greeks gave Horus the name of Apollo, confirms this sentiment: "In the mysteries," says he, (Saturn. lib. i.) "they discover us a secret, which ought to be inviolable, that the sun, arrived in the upper hemisphere, is called Apollo." Hence we may infer, that this emblematical deity was no other than the star of day, passing through the signs of summer. Plutarch, in his "Treatise of Isis and Osiris," gives us the principal traits of the history of Horus. Accordingly he is represented as the son of Osiris and Isis; and it is said, that Typhon, after killing his brother Osiris, took possession of the kingdom, and that Horus, leaguing himself with his mother Isis, avenged the death of his father, expelled the tyrant from his throne, without depriving him of

of life, and reigned gloriouſly in Egypt. Diodorus, who adopts the relation of Herodotus in theſe particulars, adds, that the Titans having put Horus to death, his mother, who poſſeſſed the moſt rare ſecrets in medicine, even that of making him immortal, having found his body in the Nile, whither they had thrown it, reſtored life to it, and procured for him immortality. After this, ſhe taught him medicine and the art of divination. With theſe talents, Orus rendered himſelf famous, and multiplied his bleſſings upon the world. As Apollo among the Greeks was called the Horus of the Egyptians, as to his ſkill both in medicine and divination, he was regarded as the ſame perſon, and called by the ancients Horus-Apollo. In all the figures of Horus which antiquity affords us in the Iſiac table, and other monuments, he is always repreſented as a child, thus intimating that he was very young when Typhon put his father to death, and that Iſis, his mother, was obliged to defer the puniſhment of the tyrant till her ſon was capable of being the inſtrument of her revenge. The allegory of Horus has been thus explained. The wind Khamſin makes great ravages in Egypt in the ſpring; by raiſing whirl-winds of burning ſands, which ſuffocate travellers, darken the air, and cover the face of the ſun, ſo as to leave the earth in perfect obſcurity. This circumſtance repreſents the death of Oſiris, and the reign of Typhon. When the ſun approaches the ſign of the lion, he changes the ſtate of the atmoſphere, diſperſes theſe tempeſts, and reſtores the northerly winds, which drive before them the malignant vapours, and preſerve in Egypt coolneſs and ſalubrity under a burning ſky. This is the triumph of Horus over Typhon, and his glorious reign. As ſome natural philoſophers have acknowledged the influence of the moon over the ſtate of the atmoſphere, they united her with this god to drive the uſurper from the throne. The prieſts conſidering Oſiris as the father of time, might beſtow the name of his ſon on Horus, who reigned three months in the year.

Jablonſki, who has interpreted the epithet of "Arueri," which the Egyptians gave to Horus, pretends that it ſignifies "efficacious virtue." Theſe expreſſions perfectly characteriſe the phenomena which happened during the reign of this god. It is in ſummer, in fact, that the ſun manifeſts all its power in Egypt. It is then that he ſwells the waters of the river with rains, exhaled by him in the air, and driven againſt the ſummit of the Abyſſinian mountains; it is then that the huſbandman reckons on the treaſures of agriculture. It was natural for them to honour him with the name of "Arueri," or efficacious virtue, to mark theſe auſpicious effects. Savary's Letters in Egypt, vol. ii. See Isis and Osiris.

ORWEL, in *Geography*, a poſt-town of America, in Vermont; the north-weſternmoſt in Rutland county, on the E. ſide of lake Champlain, containing 1376 inhabitants.

ORWELL, a river of Canada, which runs into lake Erie, N. lat. 43°. W. long. 80° 30'.—Alſo, a river of England, in the county of Suffolk, called "Ipſwich Water," which paſſes by Stow, Needham, Ipſwich, &c., and joining the Stour, forms the harbour of Harwich, called "Orwell Haven," and ſoon after diſcharges itſelf into the German ſea.

ORYCTOGNOSY, that branch of mineralogy, which has for its object the claſſification of minerals, after well aſcertained characters, and under appropriate and fixed denominations. It is the baſis of all the remaining doctrines of *mineralogy;* which ſee. As the various mineral ſubſtances are conſidered ſeparately in this work, we ſhall in the preſent article treat only on that eſſential part of this doctrine which makes us acquainted with the *characters* of minerals.

The characters employed in the deſcription of minerals are by Werner divided into five claſſes: 1. *External characters*, are thoſe which are diſcoverable by means of the external ſenſes, in the aggregation of foſſils. 2. *Chemical* or *internal characters*, are thoſe which are founded on the compoſition of the minerals, and are diſcovered by means of chemical agents and analyſis. 3. *Phyſical characters*, are thoſe which we derive from particular phyſical properties of foſſils, and which are obſerved in the relations that foſſils bear towards other ſubſtances. The moſt common of the phyſical characters is the property which ſome minerals poſſeſs of exhibiting ſigns of electricity and magnetiſm. Some minerals become electric by being heated, and others by friction; and the electricity thus excited is in ſome vitreous or poſitive, and in others reſinous or negative. Some minerals too, and particularly ſome varieties of iron ore, are diſtinguiſhed by being attracted by the magnet: ſuch are magnetic pyrites and magnetic iron ſand. By filing a mineral ſo fine, that the particles ſhall ſwim on water, and then applying a magnet, the ſlighteſt degree of magnetic effect may be obſerved. Among the phyſical properties of minerals, alſo, may be reckoned the phoſphoreſcence which is produced by friction, as in ſome varieties of blende; or by expoſure to heat, as fluor ſpar and ſome calcareous ſpars. To theſe characters alſo belongs the peculiar property of Lemnian earth, and ſome other boles, which being thrown into water ſplit into pieces with a crackling noiſe, and the property of ſome opals and other ſtones, of acquiring a higher degree of tranſparency when they are immerſed in water, hence called hydrophanes. 4. *Empirical characters*, are thoſe which, in forming an opinion of a foſſil, are deduced from the foſſils with which it is found, from the circumſtances under which it occurs, and from the place of its formation: theſe empirical characters are alſo known by the names of geognoſtic and geographic characters.

As the *external* characters, which conſtitute the chief ſubject of this article, are preſent in every ſpecies of foſſils, and in every individual; as they are derived from the diverſity in the aggregation, and are therefore indicative of the eſſential difference of foſſils; as they may, moreover, be accurately known and defined, and eaſily diſcovered, independently of the analyſis of foſſils; it is evident that they are the moſt eligible for the purpoſes of oryctognoſy. It is to the celebrated profeſſor of Freiberg that the world is indebted for a complete treatiſe on this ſubject. (Werner uber die äuſſern Kennzeichen der Foſſilien. Leipzig 1774.) In this important work the author has collected all the old and known characters, deſcribed many which he himſelf diſcovered, and given, together with accurate definitions, appropriate names to each of theſe characters, which are arranged by him in ſyſtematic order.

With regard to the arrangement of the external characters, it ſhould be obſerved that Werner divides them into *generic* and *ſpecific:* the former are certain properties of minerals uſed as characters, without any reference to their differences; ſuch as colour, luſtre, weight, &c. The differences among theſe properties form the ſpecific characters, ſuch as adamantine luſtre, vitreous luſtre, &c. The generic characters are divided into *general* and *particular*. Under the former are comprehended thoſe that occur in all minerals; under the latter, thoſe which occur only in particular claſſes of minerals. The particular generic characters are arranged according to the order in which they preſent themſelves to the ſenſes, as is exhibited in the following table.

Table

## Table of the Generic External Characters.

### General Generic External Characters.

i. The colour.
ij. The cohesion of the particles, in relation to which fossils are distinguished into Solid, Friable, and Fluid.

| | Particular generic Characters of *solid* Minerals. | | Particular generic Characters of *friable* Minerals. | Particular generic Characters of *fluid* Minerals. |
|---|---|---|---|---|
| Characters for the Sight. | External aspect - | External shape. | External shape. | The lustre. |
| | | External surface. | | |
| | | External lustre. | | |
| | Aspect of fracture - | Lustre of the fracture. | The lustre. | |
| | | The fracture. | Aspect of the particles. | |
| | | Shape of the fragments. | | |
| | Aspect of the distinct concretions - - | Shape of the distinct concretions. | | |
| | | Surface of the distinct concretions. | | |
| | | Lustre of the distinct concretion. | | Transparency. |
| | General aspect - - | The transparency. | | |
| | | The streak. | | |
| | | The soiling. | The soiling. | Fluidity. |
| | Characters for the touch - | The hardness. | | |
| | | The tenacity. | | |
| | | The frangibility. | The friability. | |
| | | The flexibility. | | |
| | | The adhesion to the tongue. | | |
| | For the hearing - - | The sound. | | |

Remaining general generic Characters.

For the touch { iij. The unctuosity. iv. The coldness. v. The weight.
For the smell vi. The smell.
For the taste vii. The taste.

*General generic external Characters, with their subordinate specific Characters.*

I. *The Colour.*—This is not only the most obvious, but in many cases also one of the most certain external characters, and even serves as the principal distinguishing mark of many mineral substances.

1. *Principal Colours.*—These are not derived from the division of the solar ray by means of the prism, but are such as are considered simple in common life. They are

*White.*—Snow-white; the purest white colour, as in quartz, white lead, Carrara marble:—reddish-white, as porcelain earth, calcareous spar from Andreasberg, brown spar:—yellowish-white; in white amber, zeolite:—silver-white; native silver, arsenical pyrites, mica:—greyish-white; common quartz, granular lime-stone:—greenish-white; amianth, talc, tremolite:—milk-white; common opal, fibrous amethyst:—tin white; white cobalt ore, native antimony, native platina.

*Grey*—of which smoke-grey is the characteristic or principal variety: lead grey; as in galena, grey antimony, graphite:—blueish-grey; indurated marle, hornstone, clay-slate:—pearl-grey; horn silver, common quartz, porcelain jasper:—smoke-grey; flint hornstone, Bolognese spar:—greenish-grey; clay-slate, common jasper, mica, fullers'-earth:—yellowish-grey; iron spar, indurated marle, common clay iron-stone:—steel-grey, grey copper ore, radiated grey manganese ore:—ash-grey; basalt, wacke, some varieties of clay-slate.

*Black.*—Of this deep or velvet black is the purest variety:—greyish-black; basalt, black lime-stone, basaltic hornblende:—iron-black; magnetic iron sand, micaceous iron, glanz coal:—greenish or raven-black; serpentine, common hornblende, pitch-stone:—browniish or pitch-black; black blende, tin-stone, bituminous slate:—dark or velvet black; obsidian, Lydian stone, common shorl:—blueish-black; black earthy cobalt, black lead ore.

*Blue.*—Of this the Prussian or Berlin blue is the characteristic, or purest variety. Indigo blue; blue iron earth, sapphire, a variety of tourmaline:—Prussian blue; radiated azure copper, sapphire, rock salt:—azure blue; lapis lazuli, earthy azure copper:—violet blue; fluor-spar, amethyst, apatite:—plum blue; spinel, axinite:—lavender blue; porcelain jasper, indurated Saxon lithomarge:—smalt blue; blue iron earth, azure copper:—sky blue; feldspar of Krieglach, turquoise.

*Green.*—The purest of its tints is emerald green. Verdigris green; copper green, iron vitriol, fluor-spar:—celadon green; green earth of Monte Baldo, noble beryl:—mountain green; noble beryl, hornstone, actinote:—emerald green; emerald, fluor, dioptase:—leek green; nephrite, prase, variety of tourmaline, augite:—apple green; chrysopras, nickel ochre:—grass green; uran mica, malachite, green lead ore:—blackish-green; serpentine, common chlorite, hornblende:—pistachio green; flaggy copper green of Salfeld, common garnet, chrysolite:—asparagus green; chrysoberyl, asparagus stone:—olive green; olive copper ore, olivine, common garnet:—oil green;

green; beryl, pitch-ſtone, green lead ore, fullers' earth:—ſiſkin green, green lead ore, uran mica, green iron earth.

*Yellow.*—Of this lemon yellow is the pureſt tint. Sulphur yellow; native ſulphur, yellow ſerpentine:—braſs yellow; copper pyrites, pale yellow native gold:—ſtraw yellow; calamine, yellow earthy cobalt:—bronze or bell-metal yellow; iron pyrites:—wax yellow; common opal, yellow lead ore:—honey yellow; honey ſtone or mellite, amber:—lemon yellow; yellow orpiment, ſome varieties of yellow lead ore:—gold yellow; deep yellow native gold, copper pyrites:—ochre yellow; yellow earth, calamine, ochrey brown iron-ſtone:—wine yellow; Saxon topaze, fluor-ſpar:—iſabel or cream yellow; iron ſpar, calamine, mountain cork:—orange yellow; realgar, red lead ore (chromate of lead).

*Red.*—Its pureſt variety is carmine red. Aurora red; a variety of realgar, blende from Scharfenberg:—hyacinth red; hyacinth, garnet:—tile red; tile ore, common clay, common jaſper:—ſcarlet red; light red cinnabar:—blood red; Bohemian garnet, light red ſilver ore, carnelian, common jaſper:—copper red; native copper:—carmine red; filiform red copper ore from Treves, bright red cinnabar:—fleſh red; feldſpar, brown ſpar, indurated lithomarge of Rochlitz:—cochineal red; dark red copper ore, dark red cinnabar:—crimſon red; noble garnet, amethyſt-ſapphire:—roſe red; roſe or milk quartz, red manganeſe ore, brown ſpar:—peach bloſſom red; cobalt bloom:—columbine red; noble garnet, red cobalt:—cherry red; red antimony from Braunſdorf, red iron-froth:—browniſh-red; common clay iron-ſtone, common jaſper.

*Brown.*—Its moſt intenſe variety is blackiſh-brown. Reddiſh-brown; tin-ſtone, brown blende:—clove brown; brown iron-ſtone, a variety of rock cryſtal:—hair brown; wood tin, wood opal:—broccoli brown; zircon:—cheſnut brown; Egyptian jaſper, opal jaſper:—yellowiſh-brown; common clay iron-ſtone, brown blende, cat's eye:—pinchbeck brown; magnetic pyrites, mica:—wood brown; mountain wood, bituminous wood, brown coal:—liver brown; brown earthy cobalt, ſemi-opal:—blackiſh-brown; mica, copper black, brown coal, &c.

2. *Shade or Intenſity of Colour.*—Colours may be determined by the relation in which they ſtand to each other, with regard to intenſity or ſhade. Thus, among the principal colours there are ſome which are light, ſuch as white and yellow; and ſome which are dark, as blue and black. And, beſides, the varieties of the principal colours differ from each other in reſpect to ſhade: thus, among the blue colours, indigo blue is dark, azure blue clear, and ſky blue light; and even the varieties may afford a diverſity of ſhade, as, for inſtance, clear ſiſkin green, light ſiſkin green. The peculiar ſhade of colour in a mineral is frequently owing to its greater or leſs tranſparency; the paleneſs being in proportion to the degree of tranſparency, and the darkneſs to the degree of opacity. The degree of luſtre, alſo, in minerals produces great variety in the ſhade of colour.

In diſcriminating the ſhade or intenſity of colour, four degrees have only in general been adopted, which are expreſſed by the words *dark*, *clear*, *light*, and *pale*.

3. *Tarniſhed Colours.*—By tarniſh is meant a difference in the colour of the ſurface, after expoſure to the air, from what the freſh fracture of the mineral exhibits. Some minerals are always found tarniſhed in their natural poſition in the earth, as is the caſe in common galena, grey antimony, and blende; ſome tarniſh on every freſh fracture being made, as in native arſenic and copper pyrites; while others are tarniſhed in both caſes, as in native arſenic and purple or variegated copper ore. The tarniſhed colours are divided into, (*a*), ſimple tarniſhed colours: *viz.* grey, as in white cobalt; black, as in native arſenic; brown, as in native ſilver, copper pyrites; reddiſh, as in native biſmuth; yellowiſh, as in white cobalt ore: and, (*b*), variegated tarniſhed colours, the varieties of which are pavonine or peacock-tail tarniſh, as in copper pyrites; irideſcent or rainbow tarniſh, as in galena; columbine or pigeon-neck tarniſh, as in biſmuth; and tempered ſteel tarniſh, as in ſpecular iron.

4. *The Play of Colours.*—By this is underſtood the property which ſome minerals poſſeſs of refracting from particular ſpots the different rays of light. The play of colours in a mineral can only be obſerved in ſun-ſhine, or in a ſtrong light. It is remarkable in the diamond, the rock cryſtal, &c.

5. *The mutable Reflection of Colour.*—This is diſtinguiſhed from the play of colours, by the mineral exhibiting in the ſame ſpot a change of colour, according to the poſition of its ſurface being varied, producing a different angle with the incident rays of light. This mutable reflection is either ſuperficial, as in Labrador ſtone; or internal, as in common opal, dichroite or iolite, &c.

6. *The Mutation of Colour.*—This is diſtinguiſhed from the tarniſh, in which latter the ſurface only undergoes a change of colour; but in the mutation of colour, the effect penetrates the mineral, and ſometimes pervades the whole. This affords two varieties: (*a*) the *fading* of colour, by which is meant, that the colour of a mineral becomes paler, when expoſed to the light and heat, or is undergoing decompoſition: thus ſtriated red cobalt, when expoſed to the air, becomes pale browniſh; chryſopraſe becomes light green, &c.: (*b*) the *perfect change* of colour is often the conſequence of fading, when one colour is loſt, and a new one appears, as in light coloured ſparry iron-ſtone, and earthy grey manganeſe.

7. *Delineations of Colours.*—Theſe are obſerved on ſimple minerals; the ſame ſpecimen containing ſeveral colours which paſs through its interior, according to certain delineations. Of theſe there are nine varieties: *viz.* dotted; when fine points of another colour are diſperſed over the ſurface, as in a variety of ſerpentine:—ſpotted; when the points or ſpots are from a quarter of an inch to one inch in diameter; they are either round and regular, or irregular:—nebulous or cloudy; when the ſpots are large and forming the appearance of clouds, as in common calcedony, carnelian, &c.:—flamy; when the ſpots are large and drawn in one direction to a ſharp point, as in a variety of common jaſper:—ſtriped; when narrower and broader ſtripes run parallel through the whole ſpecimen:—annular; when the ſtripes form concentric circles, as in flints:—dendritic; when the delineation reſembles the ramifications of a tree:—ruin-ſhaped; as in the Florentine marble:—veined; as in various marbles, ſerpentine, &c. Many of theſe ſeem to require no definition.

II. *The Cohefion of the Particles.*—According to this property, minerals are divided into ſolid, friable, and fluid; but theſe properties alſo belong to the particular generic characters of minerals, to be afterwards deſcribed.

*Particular generic Characters of Solid Minerals.*

1. *The external Aſpect.*—In the external appearance or aſpect of a mineral, three things are to be obſerved; the external ſhape, the external ſurface, and the external luſtre.

i. *The external Form.*—This is divided into common, particular, regular, and extraneous external form.

1. *Common external Form.*—Of this a mineral is ſaid to be when it exhibits no reſemblance to any known ſubſtance

in

in common life. There are ſix varieties of it: *viz.* maſſive; when a mineral is of an indeterminate form, or amorphous, or of nearly equal dimenſions, from the ſize of a hazel-nut to the greateſt magnitude:—diſſeminated; when a mineral, without any particular form, is in ſmall pieces, not exceeding the ſize of a hazel-nut, incorporated with another ſolid mineral; coarſely diſſeminated, implies the ſize of a hazel-nut to that of a pea; finely diſſeminated, is from the ſize of a pea to that of a grain of millet; and minutely diſſeminated, from the ſize of a grain of millet till it is ſcarcely perceptible to the eye:—in angular pieces; theſe are either ſharp cornered, as in calcedony and quartz, or blunt cornered, as in common opal:—in grains, which are either looſe or imbedded; they are called large, when they are from the ſize of a hazel-nut to that of a pea; coarſe, from the ſize of a pea to that of a hemp-ſeed; ſmall, from the ſize of a hemp-ſeed to that of a millet-ſeed; and according to their form they are divided into angular and rounded grains:—in plates; diſtinguiſhed into thick plates, as in red ſilver, and into thin plates, as in vitreous ſilver ore:—in membranes; theſe differ from the preceding in being ſtill thinner, not exceeding the thickneſs of common paper.

2. *Particular external Form.*—The forms which come under this denomination exhibit a greater or leſs reſemblance both to natural and artificial objects. They are called particular, becauſe, like the former, they are not uſual or common; they are alſo diſtinguiſhed by the appellation of imitative forms. There are five kinds of particular external forms: *viz.* elongated, rounded, flattened, impreſſed, and confuſed: (*a*) *elongated;* this form has eleven varieties, *viz.* dentiform, or tooth-ſhaped; native ſilver and vitreous ſilver:—filiform, or thread-ſhaped; native ſilver:—capillary, or hair-ſhaped; native gold and ſilver:—reticulated, or net-ſhaped; native ſilver and copper, and a variety of galena:—dendritic, or tree-ſhaped; native ſilver and gold:—coralloid, or branched; the ſhape of corals, as in the beautiful variety of arragonite called flos ferri:—ſtalactic, or ſtalactitic; calcareous ſinter, brown iron-ſtone, calcedony:—tubiform:—claviform, or club-ſhaped:—fruticoſe, or ſhrub-like; all theſe forms are obſervable in calcareous ſinter, brown hematite, and compact manganeſe ore: (*b*) *rounded;* of which there are five varieties, *viz.* globular; this is ſubdivided into perfectly globular, as in pea-ſtone; elliptical, as in quartz and flint; amygdaloid, as in zeolite; ſpheroidal, as in Egyptian jaſper and calcedony; and imperfectly globular, as in carnelian and calcedony:—botryoidal; reſembling a bunch of grapes, as in black cobalt ore, manganeſe:—reniform, or kidney-ſhaped; as in red hematite, native arſenic, and malachite:—tuberoſe, or knob-ſhaped; as in flint and menilite:—liquiform, or fuſed like melted lead; a rare variety of galena from Freiberg: (*c*) *flattened;* of this there are three varieties, *viz.* ſpecular; as in galena:—in laminæ, or leaves; as in native gold:—combed, or ſulcated; as in quartz from Schemnitz: (*d*) *impreſſed;* of which there are ſix varieties, *viz.* cellular; which is ſubdivided according as the cells are angular or circular:—with impreſſions; of theſe the cubic, the pyramidal, the conical, the tabular, and the globular are the moſt remarkable:—perforated; as in ſwampy iron ore:—corroded; as in quartz, galena, and vitreous ſilver:—amorphous; ſurface with irregular and indeterminable inequalities, as in ſwampy iron ore:—veſicular; as in lavas and pumice-ſtone: (*e*) *confuſed;* of which there is only one variety, *viz.* ramoſe; as native iron and vitreous ſilver.

3. *Regular external Forms or Cryſtallizations.*—In deſcribing cryſtallizations we have to conſider

A. *The eſſential Quality of the Cryſtals*, which is either genuine or ſpurious. Spurious or ſuppoſititious cryſtals are diſtinguiſhed from genuine or true cryſtals by being often hollow, having a rough or druſy ſurface, and the ſolid angles or edges never ſharp or well defined; examples are found in quartz of the ſpurious cryſtals of the cube and of the octahedron of fluor ſpar, &c.

B. *The Form of the Cryſtal.*—This is compoſed of planes; of edges formed by the junction of two planes; of plane angles; and of ſolid angles formed by the union of three or more planes in one point.

To determine the form of cryſtals it is neceſſary to define the fundamental figures, and then the ſeveral modifications of theſe forms.

*a. The Parts of the fundamental Form are:*—planes, which are either lateral or terminal; edges, which are alſo either lateral or terminal; and ſolid angles, which have been defined above.

*b. Varieties of the fundamental Form.*—They are the icoſahedron, which is compoſed of twenty equilateral triangular planes; as iron pyrites:—the dodecahedron, compoſed of twelve regular pentagonal planes that meet under obtuſe angles; as in iron pyrites and white cobalt:—the hexahedron, including the cube and the rhomb, compoſed of ſix quadrilateral planes; calcareous ſpar, fluor ſpar:—the priſm, conſiſting of an indeterminate number of quadrangular lateral planes, terminated by two planes parallel to each other, and having each as many ſides as the priſm has lateral planes; calcareous ſpar:—the pyramid, which is compoſed of an indeterminate number of triangular, lateral planes, converging to a point, and of a baſe having as many ſides as the figure has lateral planes; quartz, calcareous ſpar:—the table, which is compoſed of two lateral planes, equal and parallel, which are bounded by an indeterminate number of terminal planes; tabular barytes:—the lens, compoſed of two convex planes; ſparry iron-ſtone.

*c. Differences in each fundamental Form.*—Theſe fundamental forms differ from each other according to ſimplicity, number of planes, ſize of the planes, angles under which they meet, direction of the planes, and fullneſs of the cryſtal.

*α. Simplicity.*—This diſtinction is confined to the pyramid, which is either ſimple or double. The ſimple figure is alſo diſtinguiſhed in regard of its poſition, which is either erect or inverted: the latter, which adheres by its ſummit, is ſcarce; in the double figure the lateral planes of the one pyramid are ſet either on the lateral edges, or lateral planes of the other.

*β. Number of Planes.*—The number of planes in the icoſahedron, dodecahedron, hexahedron, and lens, is always determinate; but in the priſm, pyramid, and table, it is indeterminate. The priſm occurs with three, four, ſix, (more ſeldom with eight or nine), and twelve planes; the pyramid occurs with three, four, ſix, and eight ſides; the table has four, ſix, or eight terminal planes.

*γ. The Size of the Planes in relation to each other.*—They are either equal or unequal, and, in the latter caſe, either indeterminately or determinately unequal: the varieties obſerved in the determinately unequal planes are the following: with planes alternately broad and narrow; with two oppoſite planes broader; and with two oppoſite planes narrower.

*δ. Angles under which the Planes meet.*—Theſe are angles of the lateral edges, of the terminal edges, and of the ſummit. *Angles of the lateral edges*: theſe are equiangular, as in the icoſahedron of iron pyrites; rectangular, as in galena; oblique angular, as in rhomboidal calcareous ſpar; unequiangular, as in topaz.—*Angles of the terminal edges*: theſe are either

either rectangular, as in cubic fluor; or oblique angular, which is either parallel oblique, as in the tetrahedral prism of feldspar, or alternate oblique, as in spinel, blende, and copper pyrites.—*Angles of the summit*: these are confined to the pyramid, and present the following varieties: they are called extremely acute, when the angle is from 10° to 30°, as in calcareous spar; very acute, from 30° to 50°, as in sapphire; acute, from 50° to 70°, as in calcareous spar; rather acute, from 70° to 90°, as in quartz; rectangular, as in zircon; rather obtuse, from 90° to 100°, as in honey-stone; obtuse, from 100° to 130°, as in calcareous spar; very obtuse, from 130° to 150°, as in tourmaline; extremely obtuse, from 150° to 170°.

ε. *The Direction of the Planes.*—They are either rectilinear or curvilinear: the former are the most common; the latter are distinguished according to the position of the curvature, which is either concave, as in fluor spar; convex, as in diamond; concave-convex, as in sparry iron-stone: or according to the form, which is either spherical, as in brown spar; cylindrical, in which the convexity is either parallel with the sides, as in iron pyrites, or parallel to the diagonal, as in fluor spar; and conical, as in gypsum.

ζ. *The Fulness of the Crystal.*—Crystals are either full and perfect, which is most commonly the case; or hollowed at the extremities, as in green lead ore; or entirely hollow, as the three-sided pyramidal calcareous spar from Schemnitz.

*d. Modifications of the fundamental Form.*—The changes or alterations which take place on the fundamental form are three; truncation, bevelment, and acumination.

α. *Truncation.*—This name is given to the plane which replaces an edge or a solid angle of a fundamental form. In the truncation are to be observed the parts of the truncation, *viz.* its planes, edges, and angles; and the determination of the truncation, which relates to its situation as it occurs at the edges or angles; its magnitude; its application, as being either straight, (equally inclined on the adjacent planes,) or oblique; its direction, which presents either an even or a curvated surface.

β. *Bevelment*—takes place when the edges, terminal planes, or angles, are replaced each by two smaller converging planes terminating in an edge. In this we have to consider the parts and the determination of the bevelment —The parts of the bevelment: these are the planes, the angles, and the edges; of which latter there are two kinds, *viz.* the proper edge, formed by the meeting of the two bevelling planes, and the edges formed by the bevelling and the adjoining planes:—the determination of the bevelment, in which is to be considered its situation, as it takes place either at the terminal planes, or at the terminal edges, or at the angles:—its magnitude, which is said to be slight or deep; the angle under which the bevelling planes meet; the continuation of the bevelment, which is either uninterrupted or interrupted, and this latter either once interrupted, as in the double three-sided pyramid of calcareous spar, or twice interrupted, as in barytes; and lastly, the application of the bevelment, which is said to be straight, when the edge formed by the meeting of the two planes is perpendicular to the axis, and oblique, when the edge is not perpendicular to the axis of the crystal.

γ. *Acumination.*—The fundamental figure is said to be acuminated when its angles or terminal planes are replaced at least by three planes, which converge into a point, and sometimes into an edge. In this we have, as in the preceding, to attend to the parts of the acumination, and its determination, which latter relates to its situation; to the planes themselves, in which are to be observed their number, relative size, form, and application; to the angle of the summit of the acumination, which is either obtuse and rectangular, or acute; to the magnitude of the acumination; and lastly, to its termination, which is either a point or a line.

*e. Multiplied Modifications of the fundamental Figure.*—Besides the simple alterations or modifications of the fundamental figure, we often meet with multiplied or complicated alterations. These are said to be co-ordinate, when several different kinds of alteration occur together, as truncations and bevelments; and superimposed, when several of the same kind are placed on each other, as, for instance, when one acumination is surmounted by one or more. In describing these alterations, those ought to be mentioned first which are the largest and most essential.

C. *The Connection and Aggregation of the Crystals.*—According to this, crystals are either single or aggregated. The single crystals are either loose, or imbedded, or superimposed. The aggregated crystals are either regular or irregular. To the regular or determinate belong the twin crystals, as in staurolite, and the triple crystals, which latter, however, are very rare:—many, singly aggregated, crystals are such as are either heaped upon one another, as in calcareous and fluor spars; or adhering laterally, as in amethyst crystals; or lastly, promiscuously aggregated, as in grey antimony:—many, doubly aggregated, crystals are distributed according to the form they assume, whence the following are enumerated by Werner, *viz.* scopiform or fascicular; when aggregated, acicular and capillary crystals diverge from a common centre, as in zeolite, &c.:—fasciform, manipular, or sheaflike; when a number of crystals diverge towards both ends, and are narrower in the middle, such as prehnite and radial zeolite:—columnar; elongated, equally thick prisms adhering laterally together, are of this description, as in columnar barytes:—pyramidal; many crystals parallel to one another, but of which those in the middle are the highest, and the others decline on all sides, thus giving to the aggregation a pyramidal shape, as is exemplified by calcareous spar and amethyst:—rose-like; composed of very thin tables, variously curved, and so connected together, as to resemble a full-blown rose, as is the case with the variety of calcareous spar, called rose spar, from Joachimsthal:—amygdaloid; formed by tables accumulated in such a manner as to have an amygdaloid form, as in barytes:—globular; as in iron pyrites:—in rows; an aggregation in which the axes of all the crystals lie in one direction, like a string of pearls, as it is seen in calcareous spar, vitreous silver.

D. *The Magnitude of Crystals*, with regard to which they are divided into seven varieties, *viz.* uncommonly large; two feet and upwards in length, as in rock crystal:—very large; from two feet to six inches in length, as in beryl, calcareous spar:—large; from six inches to two in length:—middle-sized; from two inches to half an inch:—small; from half an inch to $\frac{1}{8}$th of an inch:—very small; from $\frac{1}{8}$th of an inch in length, to such as may just be distinguished by the naked eye, as in hornsilver:—microscopic; whose form cannot be distinguished by the naked eye, as in native gold, galena.

According to the relative dimensions, when compared with others, crystals are distinguished into short and low, long and high, broad and narrow, thick and thin, needle like, capillary, spicular, and globular, or tessular.

4. *Extraneous external Forms, or Petrifactions*, which are divided into those of animals and those of vegetables. See PETRIFACTIONS.

ij. *The external Surface.*—This is the second particular generic character of solid minerals; the following are its varieties, *viz.* uneven; having irregular elevations and depressions, as in calcedony:—granular; when the elevations

are ſmall, round, and nearly equal, as in ſtalactitical brown hematite:—druſy; having minute, prominent, equal cryſtals on the ſurface, as in quartz:—rough; when the elevations are minute, and almoſt imperceptible, as in quartz:—ſmooth:—ſingly ſtreaked: cryſtals are ſtreaked longitudinally, as in topaz, ſhorl; tranſverſely, as in rock-cryſtal; diagonally, as in aplome; alternately ſtreaked, when the tranſverſe and longitudinal ſtreaks occur on alternate planes, cubic iron pyrite and brown iron-ſtone:—doubly ſtreaked; plumiformly doubly ſtreaked, or like a feather, in native ſilver; reticularly or net-ſhaped, as in grey cobalt ore.

iij. *The external Luſtre.*—In this third particular generic character we have to diſtinguiſh

*a.* The *intenſity* of the luſtre, of which there are five degrees, *viz.* ſplendent; the ſtrongeſt kind of luſtre, as in galena and ſelenite:—ſhining; as in barytes, pitch ſtone, copper pyrites:—gliſtening, or weakly ſhining, as in grey copper ore, porcelain, jaſper, and ſplintery quartz:—glimmering; as in clay iron-ſtone, red hematite:—faintly glimmering, which may be exemplified by Lydian ſtone.

*b.* The *kind* of luſtre, which is either common or metallic. The common luſtre belongs chiefly to earthy ſtones and ſalts: it is vitreous or glaſſy; as in rock-cryſtal, topaz:—reſinous; in pitch-ſtone, yellow lead ore:—pearly; in cyanite, zeolite, and ſelenite:—adamantine; in diamond, white lead ore:—ſemi-metallic; in mica, red hematite. The metallic luſtre we have in copper pyrites, grey copper ore, &c.

II. *Aſpect of the Fracture.*—Here, as in the external aſpect, three kinds of characters preſent themſelves, *viz.* the luſtre of the fracture, the fracture, and the form of the fragment.

1. The *luſtre* of the fracture, or the internal luſtre: its determination is the ſame as that of the external luſtre.

2. The *Fracture.* (*a.*) The *compact* fracture; its varieties are ſplintery, either coarſe or fine ſplintery; both of which kinds of fracture occur in horn-ſtone, lime-ſtone, and quartz:—even, as in galena, Lydian ſtone, calcedony, chryſoprafe:—conchoidal; which is diſtinguiſhed, according to the ſize, into large and ſmall; according to the appearance, into deep and imperfect; and according to the depth, into flat and conchoidal:—uneven; which is either coarſe-grained, as in copper pyrites; or ſmall-grained, as in copper nickel; or fine-grained, as in arſenical pyrites:—earthy; as in chalk, clay iron-ſtone, &c.:—hackly; in which the fracture exhibits ſharp points, which is peculiar to the metals, as in native gold and native copper.

*b.* The *fibrous* fracture, in which are to be obſerved the thickneſs of the fibres, as they are coarſe, fine, or delicate; gypſum, fine fibrous malachite, wood tin:—the direction of the fibres; which is ſtraight, as in red hematite; or curved, as in black hematite and fibrous rock-ſalt:—the poſition of the fibres, which is promiſcuous, as in plumoſe antimony; parallel, as in amianth; or diverging, which latter is diſtinguiſhed into ſtellular, as in brown hematite; and ſcopiform, as in red hematite and malachite.

*c.* The *radiated* fracture, which is ſubdivided, according to the breadth of the rays, into uncommonly broad radiated, as in grey antimony; broad radiated, as in actinote; and narrow radiated. According to the direction of the rays; into ſtraight radiated, and curved radiated. According to the poſition of the rays, into promiſcuous radiated, as in grey antimony; parallel, as in hornblende; and diverging, which latter is either ſtellular, as in cobalt bloom; or ſcopiform, as in grey antimony. With regard to the aſpect of the rays, we find their ſurface either ſtreaked, as in hornblende, or ſmooth, as in actinote and antimony.

*d.* The *foliated* fracture, in which are to be determined the ſize of the folia:—the degree of perfection of the folia, according to which the fracture is ſpecular, as in galena; perfectly foliated; imperfectly foliated, as in fluor ſpar; ſlaty, as in clay ſlate; and concealed foliated, as in rock cryſtal:—the direction of the folia, which is ſtraight, as in ſelenite, or curved foliated; this latter is ſubdivided into ſpherically curved, as in brown ſpar; undularly curved, as in talc; petaloidally curved, as in a variety of feldſpar; and indeterminately curved, as in mica:—the poſition of the folia; it is either common foliated, in which the folia cover each other completely, or ſcaly, in which they cover each other partially, as in mica:—the aſpect of the ſurface of the folia, which is either ſmooth or ſtreaked.

*e.* The *Paſſage* or *Cleavage of the Folia*, which is diſtinguiſhed according to the number of the cleavages into ſingle, as in mica; double, as in feldſpar, hornblende; threefold, as in calcareous ſpar; quadruple, as in fluor ſpar; and ſextuple cleavage, as in blende:—according to the angle under which the cleavages interſect one another:—according to the greater or leſs degree of perfection of each cleavage.

Sometimes ſeveral kinds of fracture occur in one and the ſame mineral, ſo that one is contained in the other, in which caſe the fracture in the large is to be diſtinguiſhed from the fracture in the ſmall; thus, for inſtance, the fracture of clay-ſlate may be flaty in the large, and earthy or uneven in the ſmall: or one fracture may traverſe the other, in which caſe the longitudinal or principal fracture is to be diſtinguiſhed from the tranſverſal or croſs fracture; thus in baſaltic hornblende, the longitudinal fracture is ſtraight foliated, while the croſs fracture is ſmall conchoidal paſſing into uneven, &c.

3. *The Form of the Fragments*, which is either regular or irregular; the *regular* are cubic fragments, as in galena, rock-ſalt:—rhomboidal, in which caſe the fragments are ſpecular on all planes, as in calcareous ſpar; or ſpecular on four ſides, as in feldſpar; or ſpecular on two ſides, as in ſelenite:—trapezoidal, as in foliated coal:—trihedral-pyramidal, as in fluor ſpar:—dodecahedral, as in blende. The *irregular* fragments are cuneiform, as in wood tin, red hematite:—ſplintery, as in aſbeſt, actinote:—tabular, as in mica, indurated talc:—indeterminately angular, which are moſt common, and are diſtinguiſhed, according to the degree of ſharpneſs which the edges of the fragments poſſeſs, into very ſharp-edged, as obſidian; ſharp-edged, as horn-ſtone; rather blunt-edged, as lime-ſtone; blunt-edged, as gypſum; and very blunt edged.

III. *Aſpect of the diſtinct Concretions.*—Diſtinct concretions are thoſe maſſes into which certain minerals are naturally divided, and which can be ſeparated from one another without breaking through the ſolid or freſh part of the mineral. We conſider in them

1. The *form* of the diſtinct concretions; it is granular, lamellar, and columnar.

*a.* The *granular* is diſtinguiſhed, with reſpect to form, into round granular, which again is ſpherically granular, as in roe-ſtone; and lenticularly granular, as in red granular clay iron-ſtone:—angular-granular, which is either common, as in galena; or elongated, as in zeolite. With reſpect to magnitude, the granular diſtinct concretions are large granular; the ſize of hazel-nuts and upwards, as in galena, zeolite:—coarſe-granular; from the ſize of a hazel-nut to that of a pea, as in blende, mica, pea-ſtone:—ſmall granular; from the ſize of a pea to that of a millet-ſeed, as in galena, black blende:—fine granular; from the ſize of a millet-ſeed to juſt diſcoverable by the naked eye; roe-ſtone, ſparry iron-ſtone.

*b. Lamellar*, which, with reſpect to direction, is ſtraight

lamellar; and again either quite ſtraight, as in ſome varieties of galena and barytes, or fortification-like, as in amethyſt: —curved lamellar, which is either indeterminate, as in ſpecular iron; reniform, as in native arſenic; ſpherical-concentric, as in calcedony, and conical-concentric, as in calcareous ſpar. With regard to thickneſs, into very thick lamellar, if above $\frac{1}{2}$ an inch in thickneſs, as in amethyſt: —thick lamellar, between $\frac{1}{2}$ and $\frac{1}{4}$ of an inch thick, as in amethyſt, barytes, galena:—thin lamellar, between $\frac{1}{4}$ and $\frac{1}{12}$ of an inch, as in barytes:—very thin lamellar, varying between a line and the thickneſs juſt perceptible by the naked eye, as in native arſenic and brown ſpar.

*c. Columnar* denominate thoſe diſtinct concretions in which the breadth and thickneſs are inconſiderable in compariſon of the length; theſe, with reſpect to direction, are ſtraight columnar, as in calcareous ſpar; and curved columnar, as in clay iron-ſtone. With regard to thickneſs, they are very thick columnar, as in quartz and calcareous ſpar; thick columnar, as in calcareous ſpar and amethyſt; thin columnar, as in clay iron-ſtone; very thin columnar, as in amethyſt, ſhorl. With reſpect to ſhape they are perfect columnar, when throughout of the ſame thickneſs; imperfect columnar, as in amethyſt and ſpecular iron; cuneiform columnar, as in calcareous ſpar and quartz. With reſpect to poſition, they are parallel columnar, as in quartz, and ſhorl beryl; diverging columnar, as in calcareous ſpar and clay iron-ſtone; and promiſcuous columnar, as in calcareous ſpar and arſenical pyrites. In ſeveral minerals two of theſe varieties, or different ſizes of the ſame variety of diſtinct concretions, occur together, either the one including the other, or the one traverſing the other.

2. *The Surface of the diſtinct Concretions.*—This is ſmooth, as in hematite; rough, as in clay iron-ſtone; ſtreaked, which is either longitudinally ſtreaked, as in ſhorl, obliquely, as in calcareous ſpar, or tranſverſely, as in amethyſt; uneven, as in brown blende.

3. *The Luſtre of the diſtinct Concretions*, which is determined in the ſame manner as the external luſtre.

IV. *The general Aſpect.*—This comprehends the tranſparency, the ſtreak, and the foiling.

1. The *Tranſparency*, which is diſtinguiſhed into tranſparent; which is again either ſimply tranſparent, or doubly tranſparent, as in calcareous ſpar (ſee REFRACTION, *Double*); ſemi-tranſparent, as in opal and calcedony; tranſlucent, as in pitch-ſtone, granular lime-ſtone; tranſlucent at the edges, as in horn-ſtone, heliotrope; opaque, as in chalk, &c.

2. The *Streak*, which is either of the ſame colour, as in chalk, or more or leſs different: thus crimſon red cinnabar yields a ſcarlet-red ſtreak; aurora red orpiment, an orange-yellow ſtreak. Moſt native metals have their luſtre increaſed by the ſtreak.

3. The *Soiling* minerals are diſtinguiſhed into ſuch as ſimply ſoil, and this either ſtrongly, as red ſcaly iron-ore; or ſlightly, as molybdena: and into ſuch as both ſoil and mark or write, ſuch as graphite, drawing-ſlate, and chalk.

V. *Characters for the Touch.*—To theſe Werner refers the hardneſs, the tenacity, the frangibility, the flexibility, and the adheſion to the tongue.

1. *The Hardneſs.*—This character is diſtinguiſhed into extremely hard, when the file makes no impreſſion on a mineral, ſuch as the diamond, ſapphire; very hard, when it makes a weak impreſſion, as on topaz and rock cryſtal: hard, when the file makes a conſiderable impreſſion, as on feldſpar; ſemi-hard, when it may be ſcraped with a knife, but gives no fire with ſteel, as baſalt, lime-ſtone: ſoft, when it is eaſily cut by the knife, and even yields to the nail of the finger, as gypſum and ſulphur.

2. The *Tenacity.*—Its degrees are; brittle, when the particles are in the higheſt degree coherent and immoveable, as in quartz, grey copper ore; ſectile, when the particles are coherent, but not perfectly immoveable among one another, as in galena; malleable or ductile, when the integrant particles are coherent, and alſo more or leſs moveable among one another, as in moſt of the native metals.

3. The *Frangibility.*—Its degrees are the following; very difficultly frangible, ſuch as moſt native metals; difficultly frangible, as baſalt; rather eaſily frangible, as flint, quartz; eaſily frangible, as opal; very eaſily frangible, as amber, &c.

4. The *Flexibility*, which is diſtinguiſhed into common, as in malleable minerals, amianth, &c.; and elaſtic, as in mica.

5. The *Adheſion to the Tongue*, according to which minerals poſſeſs this property ſtrongly, as hydrophane opal; rather ſtrongly, as bole; weakly, as talc; very weakly, as clay.

VI. *Characters for the Hearing.*—The *Sound.* It is ringing or ſounding, as in native arſenic; creaking, as in native amalgam when preſſed with the finger; grating or ruſtling, as in paſſing the finger over mountain cork and mealy zeolite.

*Particular generic Characters of Friable Minerals.*—The characters included under this article are, the external form, the luſtre, the appearance of the particles, the ſtain, and the friability.

1. The *external Form.*—According to this, friable minerals are maſſive, as porcelain earth; diſſeminated, as blue iron earth; thinly coating, as black copper ore; ſpurious, as ſcaly brown iron-ſtone, or brown iron froth; dendritic, as earthy and grey manganeſe ores. 2. The *luſtre*, which is determined as in ſolid minerals; but friable minerals occur only as glimmering or dull: the glimmering is either common glimmering, as in indurated cobalt ochre; metallic glimmering, as in brown iron froth; pearly glimmering, as in earthy talc; dull, as in earthy cobalt ochre, &c. 3. The *aſpect of the particles*, which are either duſt-like, as in porcelain earth; or ſcaly, as in talc earth, chlorite earth. 4. The *ſoiling*, or *ſtain*, which is either ſtrong, as in iron froth; or ſlight, as in black cobalt ochre. 5. The *friability*, with regard to which, the particles of friable minerals are either looſe, that is, when they have no perceptible coherence, as in blue iron earth; or cohering, as in cobalt cruſt.

*Particular generic Characters of Fluid Minerals.*—In theſe Werner conſiders, 1. The *luſtre*, which is either metallic, as in mercury; or reſinous, as in petroleum. 2. The *tranſparency*; tranſparent, as in naphtha; turbid, as in petroleum; opaque, as in mercury. 3. The *fluidity*; fluid, as in mercury; viſcid, as in mineral tar.

*Remaining common generic external Characters.*

1. The *Unctuoſity*, of which there are four degrees, *viz.* meagre, as is the caſe with moſt minerals; rather greaſy, as pipe clay; greaſy, as fuller's earth and ſteatite; very greaſy, as talc.

2. The *Coldneſs*, which includes three degrees, *viz.* cold, ſuch as baſalt, jaſper, porphyry; rather cold, as ſerpentine gypſum; ſlightly cold, as amber. By this character, cut and poliſhed ſtones may often be diſtinguiſhed, as alſo real gems, from thoſe which are artificial.

3. The *Weight.*—In order to determine with accuracy the ſpecific gravity of minerals, a hydroſtatic balance is made uſe of; but when this cannot be had recourſe to, a mineral is examined, by lifting it in the hand, and comparing its weight, thus eſtimated by the feeling, with its volume, by which means an approximation may be made to its ſpecific gravity. Five degrees of this mode of eſtimating the weight



of

of minerals have been aſſumed, *viz.* 1. Supernatant; ſuch minerals as ſwim in water, as naphtha, mountain cork. 2. Light, ſuch as have a ſpecific gravity between 1.000 and 2.000 (taking water at 1.000); amber, mineral pitch, pit-coal. 3. Rather heavy; ſuch as have a ſpecific gravity between 2.000 and 4.000, which is the caſe with moſt kinds of ſtones, as amianthus, rock-cryſtal, mica, &c. 4. Heavy; when the ſpecific gravity is from 4.000 to 6.000, as in moſt metallic ores, ſuch as grey copper ore, red hematite, &c. 5. Extremely heavy; when the ſpecific gravity exceeds 6.000, which includes the native metals, as native gold, native ſilver, native copper, and ſome others, as galena, tin-ſtone cryſtals, ſulphuretted biſmuth, and vitreous ſilver ore.

4. The *Smell.*—It is characteriſtic of only a ſmall number of minerals. It is obſerved either of itſelf, without addition, and is bituminous, as in mineral pitch; ſlightly ſulphureous, as in native ſulphur and grey antimonial ore; bitteriſh, as in ochre kept cloſe ſhut up for ſome time; clayey, as in yellow chalk:—or, it is obſerved, after breathing on a mineral, which ſhould be cold and breathed upon ſtrongly and quickly, when the ſmell perceived is clayey bitter, as in hornblende, and ſome ſienites:—or it is obſervable, after rubbing or ſtriking, when the ſmell emitted is reſinous, as in ſwine-ſtone after rubbing; ſulphureous, as in pyrites; garlic, as in arſenical pyrites and white cobalt ore; empyreumatic, as in quartz and pitcoal.

5. The *Taſte*, which is characteriſtic of one claſs of minerals only, *viz.* the ſalts; and it is ſweetiſh ſaline, as rock-ſalt; ſweetiſh adſtringent, as native alum; ſouriſh adſtringent, as native vitriol; bitter ſaline, as native Epſom ſalt; cooling ſaline, as native nitre; lixivious, as native alkali; urinous, as native ſal ammoniac.

ORYCTOGRAPHY, formed of ορυκτος, *foſſil*, and γραφω, *I deſcribe*, is that part of natural hiſtory in which foſſils are deſcribed. See ORYCTOGNOSY.

ORYCTOLOGY, of ορυκτος, *foſſil*, and λογος, *diſcourſe*, is that part of phyſic which treats of foſſils.

ORYGIA, in *Botany*, a name perverted from the barbarous Arabic one *Horudjrudi*, and applied by Forſkall, in his Fl. Ægypt-Arab. 103, to a ſuppoſed new genus, eſtabliſhed by him, upon two ſpecies of PORTULACA, or rather TALINUM. See thoſe articles. See alſo Willd. Sp. Pl. v. 2. 864.

ORYGMA, ορυγμα, among the Athenians, a name given to the pit, more uſually called *barathrum*; whence the public executioner received the appellation of ὁ επὶ τω ορυγματι.

ORYX, in *Zoology*, a ſpecies of *Antilope*. See PASAN.

ORYZA, in *Botany*, an ancient name, ορυζα of the Greeks, ſuppoſed by profeſſor Martyn to be, poſſibly, derived from ορυσσω, *to dig*. Whether this name may have originally been applied to various ſorts of grain, or pulſe, procured by means of *digging*, or *cultivation*, the ſhort account given by Dioſcorides, decidedly indicates his ορυζα to have been our rice. "*Oryza*," ſays he, "is a kind of grain, which grows in marſhy and watery places. It is moderately nutritious, and of a binding quality." Linn. Gen. 177. Schreb. 237. Willd. Sp. Pl. v. 2. 247. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 317. Juſſ. 32. Tourn. t. 296. Lamarck Illuſtr. t. 264. Gærtn. t. 80.—Claſs and order, *Hexandria Digynia*. Nat. Ord. *Gramina*.

Gen. Ch. *Cal.* Glume of two minute, pointed, nearly equal valves, containing one flower. *Cor.* of two boat-ſhaped, concave, compreſſed valves, of equal length; the broadeſt with five angles, and a terminal awn; the inner one narroweſt. Nectary of two minute flat leaves, at one ſide of the germen, each leaf narrow at the baſe, abrupt at the ſummit, deciduous. *Stam.* Filaments ſix, capillary, the length of the corolla; anthers cloven at the baſe. *Piſt.* Germen ſuperior, turbinate, angular; ſtyles two, capillary, reflexed; ſtigmas club-ſhaped, feathery. *Peric.* none, except the corolla, which becomes firmly attached to the ſeed, of an oval-oblong form, compreſſed, with thin edges, and two furrows at each ſide. *Seed* ſolitary, large, oblong, obtuſe, compreſſed, with two furrows at each ſide.

Eſſ. Ch. Calyx a glume of two valves, containing a ſingle flower. Corolla of two valves, angular, of equal length, growing to the ſeed.

1. O. *ſativa*. Common Rice. Linn. Sp. Pl. 475. Miller Illuſtr. t. 19. (Oryza; Camer. Epit. 192. Matth. Valgr. v. 1. 365. Ger. em. 79.)—Native of Ethiopia. Cultivated in tropical countries very abundantly, as well as in ſome of the warmer parts of Europe, in grounds for the moſt part artificially inundated. Gerarde had rice in his garden before 1596. It is annual, flowering in the middle of ſummer, and can only be kept in the ſtove. *Root* fibrous. *Herb* graſſy, about four or five feet high, light green, ſmooth. *Leaves* linear, narrow, taper-pointed. *Stipula* long, abrupt, jagged, crowning the very long ſtriated *ſheath*. *Panicle* terminal, much branched, many-flowered, nearly erect, ſlightly ſpreading; its branches angular, rough. *Flowers*, when cloſed, obovate, oblique, or moſt gibbous at one ſide; their *corolla* ſomewhat hairy, curiouſly and minutely granulated or dotted. *Awn* ſtraight, rough, various in length.

Moſt authors have conſidered this as the only ſpecies of *Oryza*. Loureiro ſays there are ſeveral varieties of it, and as he thinks ſome really diſtinct ſpecies, of which he gives the following particulars, to lead the way to fuller botanical obſervations.

1. O. *communiſſima*. Common Rice. Lourcir. Cochinch. 215.—Of this the *ſtem* is four feet high. *Panicle* ſpiked, the ſpikes moſtly ſimple. Huſk of the *ſeed* pale, oblong, with long *awns*. This is a late ſort, gathered from ſix to eight months after it is ſown. It inhabits marſhy places; growing ſickly from drought, or a ſlight influx of ſalt water; and if expoſed in a great degree to either, it periſhes.

2. O. *præcox*. Early Rice. Ibid.—*Stem* three feet high. Panicle ſpiked, the ſpikes branched. Huſk of the *ſeed* turgid, browniſh-red; with ſhorter *awns*.—Ripens in the fourth month. Grows in marſhy places, but is not injured by ſalt inundations.

3. O. *montana*. Mountain Rice. Ibid.—*Stem* as high as the laſt, but more ſlender. Huſk of the *ſeed* longer; the *awns* extremely long. It is ſown in dry mountainous ſituations. If expoſed to a continued inundation, it decays. Sea water kills it.

Sir Joſeph Banks has lately obtained ſeed of this valuable kind of rice, from the mountainous parts of India, where it is expoſed to a conſiderable degree of cold. It may prove a valuable acquiſition, if capable of culture in Europe.

4. O. *glutinoſa*. Glutinous Rice. Ibid.—*Stem* four feet high. *Leaves* broader, and yelloviſh. *Panicle* large, with ſhorter *awns*. *Seed* oblong, rather large, glutinous, uſually very white.—Grows both in watery and dry places. There is a variety whoſe *ſeed* is extremely black, and of an excellent flavour; as well as another with red *ſeed*. *Loureiro*.

This fourth ſort appears to be what J. Miller has figured, as above quoted.

Rice ſeems to contain more ſilicеous earth in its compoſition, than moſt of its natural order.—Even the ſeed is not deſtitute of this ſubſtance. Very brilliant imitations of precious

precious ſtones are reported to be made of rice, for which purpoſe a prodigious quantity of the grain is required.—It is however a vulgar error that certain figures, cups, &c. of a whitiſh ſemitranſparent hue, brought from the Eaſt, and actually carved out of ſoap-rock, or ſome ſuch ſtone, are made of boiled rice.

ORYZA, in *Gardening*, contains plants of the exotic annual kind, of which the ſpecies is rice (O. ſativa).

There are ſeveral varieties of it, namely,

The *Common Rice*, which has the culm four feet high; the panicle ſpiked, the ſpikes commonly ſimple; the fruit oblong, pale, with long awns. It is late, and is cut from ſix to eight months after planting.

The *Early Rice* has the culm three feet high; the panicle ſpiked; ſpikes branching; the fruit turgid, browniſh-red, with ſhorter awns. It ripens and is cut in the fourth month from planting.

The *Dry*, or *Mountain Rice*, has the culm three feet high, and more ſlender; the fruit longiſh, with awns the longeſt of all. It is ſown on mountains, and in dry ſoils.

The *Clammy Rice* has the culm four feet high; the leaves wider, yelloviſh; panicle large, with ſhorter awns; the ſeed oblong, largiſh, glutinous, uſually very white. This is cultivated both in wet and dry places.

It varies with a black ſeed, which is higher flavoured, and alſo with a red ſeed.

And there are ſome other varieties.

*Method of Culture.*—Theſe plants may be increaſed by ſeeds in the early ſpring. They ſhould be ſown on a hot-bed, and when the plants are come up, be tranſplanted into pots filled with rich light earth, and placed in pans of water, which ſhould be plunged into a hot-bed; and as the water waſtes, it muſt be renewed from time to time. They muſt be kept in the ſtove all the ſummer, and towards the end of Auguſt they will produce the grain, which will ripen tolerably well, provided the autumn prove favourable for the plants.

They afford variety in the hot-houſe collections.

ORYZEUM, a name given by many of the chemical writers to gold.

ORYZOPSIS, in *Botany*, from ὀρυζα, *rice*, and ὀψις, *aſpect* or *reſemblance*, becauſe the plant has the habit of rice; a faulty appellation given by Michaux, contrary to the law which prohibits ſuch compounds or comparative generic names. Michaux Boreal-Amer. v. 1. 51. Vahl. Enum. v. 2. 397.—Claſs and order, *Triandria Monogynia*. Nat. Ord. *Gramina*.

Gen. Ch. *Cal.* Glume ſingle-flowered, of two nearly equal, broadly elliptical, ſomewhat keeled, concave, ribbed valves, the outer one broader, and rather ſhorter. *Cor.* encompaſſed at the baſe with an annular tuft of hairs; its outer valve cloſe, coriaceous, oval, ſomewhat cylindrical, ſmooth, with a terminal ſetaceous awn; inner concealed by the outer, much narrower, nearly linear, awnleſs. Nectary of two linear leaflets, the length of the germen. *Stam.* Filaments three; anthers rather prominent, long, linear, rather bearded at the point, ſlightly cloven at the baſe. *Piſt.* Germen ſuperior, oblong; ſtyle a little longer than the corolla, ſlender, compreſſed, minutely downy at the edge; ſtigmas two, ſpreading, capillary, minutely glandular, and downy. *Seed* ſolitary.

Eſſ. Ch. Calyx of two valves, ſingle-flowered. Corolla of two valves; the outermoſt awned. Nectary of two linear leaves.

1. O. *aſperifolia*. Michaux t. 9.—Native of the chain of mountains from Hudſon's Bay to Quebec. *Stems* ſeveral, unbranched, with one or two knots; leafy at the bottom. Loweſt *leaf* almoſt as long as the ſtem, linear-lanceolate, acute; upper ones remote, ſhort, narrow, flattiſh, rigid, rough-edged, and rather pungent, much ſhorter than their ſheaths. *Flowers* in a racemoſe panicle, not numerous, reſembling thoſe of rice in general aſpect, but totally unlike in ſtructure, the *calyx* being moſt like the *corolla* of *Oryza*. Vahl, after Richard, deſcribes the *ſtyle* as three-cleft, though the *ſtigmas* are ſaid to be but two.

ORZERO, in *Geography*, a town of Iſtria, in the gulf of Venice, near the ſea; 5 miles N. of Rovigno. N. lat. 45° 13′. E. long. 13° 53′.

OS, in *Anatomy*. See BONE.

Os *Argenteum*, in *Natural Hiſtory*, the name of a ſpecies of ſhell-fiſh, of the Turbo genus. See TURBO *Argyroſtomus*.

Os *Aureum*, the *Golden Mouth*, a name given to a ſpecies of the Turbo. See TURBO *Chryſoſtomus*.

Os *Calcis*, in *Anatomy*. See EXTREMITIES (*Foot*).

Os *Calcis, Luxated*. See LUXATION.

Os *Carpi*. See EXTREMITIES (*Carpus*).

Os *Magnum Carpi*. See EXTREMITIES (*Carpus*).

Os *Claviculæ*. See EXTREMITIES (*Upper Extremity*).

Os *Coccygis*. See EXTREMITIES.

Os *Cuneiforme*. See EXTREMITIES.

Os *Ethmoides*. See CRANIUM.

Os *Externum* and *Internum Uteri*; the former is the front opening of the vagina: the latter, called alſo os tincæ, is the aperture of the uterus in the vagina. See GENERATION.

Os *Femoris*. See EXTREMITIES.

Os *Frontis*. See CRANIUM.

Os *Humeri*. See EXTREMITIES.

Os *Hyoides*. See DEGLUTITION.

Os *Ilium*. See ILIUM.

Os *Innominatum*. See EXTREMITIES.

Os *Iſchii*. See ISCHIUM, and EXTREMITIES.

Os *Lunare*. See LUNARE *Os*, and EXTREMITIES.

OSSA *Malarum*. See MALARIA, and CRANIUM.

OSSA *Maxillaria*. See MAXILLARIS, and CRANIUM.

OSSA *Metacarpi*. See METACARPUS, and EXTREMITIES.

Os *Occipitis*. See CRANIUM.

Os *Orbiculare*. See EXTREMITIES.

OSSA, *Naſi*. See NOSE.

OSSA, *Palati*. See PALATE, and CRANIUM.

OSSA, *Parietalia*. See PARIETALIA *Oſſa*, and CRANIUM.

Os *Pectoris*. See STERNUM, and EXTREMITIES.

Os *Pubis*. See PUBIS, and EXTREMITIES.

Os *Sacrum*. See EXTREMITIES.

Os *Sacrum, Fractured*. See FRACTURE.

Os *Scaphoides*. See SCAPHOIDES.

Os *Scapulæ*. See SCAPULA, and EXTREMITIES.

Os *Sepiæ*. See CUTTLE-*fiſh-bone*.

Os *Sphenoides*. See SPHENOIDES, and CRANIUM.

OSSA *Temporum*. See CRANIUM.

Os *Tincæ*. See UTERUS, and Os *Externum*.

For other bones not above enumerated, ſee CRANIUM, DEGLUTITION, and EXTREMITIES. See alſo FRACTURE, and LUXATION.

Os, or *Oſs*, in *Geography*, a town of Brabant; 10 miles N.E. of Bois-le-Duc.

OSA, a river of Etruria, which runs into the ſea, N. lat. 42° 38′. E. long. 11° 12′.—Alſo, a town of Ruſſia, in the government of Perm, on the Kama; 80 miles S.W. of Perm. N. lat. 56° 56′. E long. 53° 54′.

OSA *de la Vega, La*, a town of Spain, in New Caſtile; 36 miles S. of Huete.

OSACEA, a ſea-port town of Japan, in the iſland of Niphon,

Niphon, and, next to the two capitals Meaco and Jedo, the moſt conſiderable for wealth, munificence, and population. It is ſituated in a large bay, to which it gives name, near the mouth of the river Jedogawa, which is ſaid to be here as large as the Thames at London. The port is defended by a ſtrong caſtle, commanding the city and river, and always well garriſoned. Oſacea abounds with all ſorts of proviſions and merchandiſe. The neighbouring country furniſhes an heath of a beautiful orange-colour, with which they cover their houſes, and great quantities of which they convey to other parts of the empire for the ſame purpoſe; 25 miles S.W. of Meaco. N. lat. 35° 8′.

OSADA, a ſmall iſland in the Sooloo Archipelago. N. lat. 6° 5′. E. long. 120° 28′.

OSAGE, a river of Louiſiana, which runs from the W. into the right bank of the Miſſouri; about 24 miles from the Miſſiſippi.

Osages, an Indian nation which inhabits the vicinity of the above-named river, on the right bank of the Miſſouri, about 80 leagues from its confluence with it. This nation numbers 2000 warriors, who occupy two ſettlements near each other. Their ſtature is gigantic and well-proportioned: they are enemies of the whites, and of all other Indian nations, and commit depredations from the Illinois to the Arkanſas. The trade of this nation is ſaid to be under an excluſive grant. The people are a cruel and ferocious race, hated and dreaded by all the other Indians.

OSARA, a town of Japan, in the iſland of Niphon. N. lat. 35° 10′. E. long. 136° 40′.

Osara, *Aſchara*, or *Aſara*, a town of Syria, in the Deſert, near the Euphrates; 170 miles E.S.E. of Aleppo.

OSBANIKET, a town of Turkeſtan, on the Sirr; 30 miles W. of Toucat.

OSBECKIA, in *Botany*, received its name from Linnæus, in honour of his diſciple Peter Oſbeck, a Swediſh clergyman, who performed a voyage to China, as chaplain to a Swediſh Eaſt Indiaman, and publiſhed an account of his voyage, particularly of his obſervations in natural hiſtory, which has been tranſlated into German and Engliſh. The author was living, a few years ſince, at an advanced age, as a country clergyman in Sweden, nor have we heard of his death. He has contributed ſeveral papers on fiſhes, inſects, and various economical plants, to the Stockholm Tranſactions. Linn. Gen. 186. Schreb. 249. Willd. Sp. Pl. v. 2. 300. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 340. Juſſ. 330. Lamarck Illuſtr. t. 283. Gærtn. t. 126?—Claſs and order, *Octandria* (or rather perhaps *Decandria*) *Monogynia*. Nat. Ord. *Calycanthemæ*, Linn. *Melaſtomæ*, Juſſ.

Gen. Ch. *Cal.* perianth of one leaf, bell-ſhaped, permanent; limb in four or five deep, oblong, acute ſegments, with intermediate fringed ſcales. *Cor.* Petals four or five, roundiſh, ſeſſile, longer than the calyx. *Stam.* Filaments eight or ten, thread-ſhaped, ſhort; anthers oblong, erect, or ſlightly curved, each terminated by a ſlender beak about its own length. *Piſt.* Germen ovate, cloſely united with the body of the calyx in the lower part, terminating above in four or five fringed ſcales; ſtyle cylindrical, ſlightly curved, the length of the ſtamens; ſtigma ſimple, obtuſe. *Peric.* Capſule roundiſh-ovate, firmly clothed with the body of the calyx, (which is tubular and abrupt at the ſummit), of four or five cells, burſting longitudinally at the top. *Seeds* numerous, kidney-ſhaped. *Receptacles* lunate.

Eſſ. Ch. Calyx with four or five deciduous teeth, and fringed intermediate ſcales. Petals four or five. Anthers beaked. Capſule of four or five cells, clothed with the abrupt body of the calyx.

Obſ. There is ſome difficulty in diſtinguiſhing this genus from *Rhexia*. Willdenow juſtly remarks that "the capſule of the latter is encloſed in the calyx;" but it can ſcarcely be ſaid that "the germen is inferior in *Oſbeckia*." It is indeed cloſely united with the calyx, which in ſome new African ſpecies is clothed with curiouſly fringed ſcales, though naked in the original Chineſe one. In *Rhexia* the body of the calyx is not connected with the capſule. Perhaps, however, the permanent and ſimple teeth of the calyx, deſtitute of intermediate ſcales, may prove the beſt character of *Rhexia*. The dry capſular fruit diſtinguiſhes *Oſbeckia* from *Melaſtoma*, to ſay nothing of the calyx. Linnæus in his *Prælect. in Ord. Nat. Plantarum*, 335, ſeems to think *Rhexia* ſcarcely well diſtinguiſhed from *Oſbeckia*, not adverting to the connection of the calyx, nor to its teeth.

* *Flowers four-cleft, with eight ſtamens.*

1. O. *chinenſis*. Chineſe Oſbeckia. Linn. Sp. Pl. 490. Oſb. Voy. Engliſh edition; 342. t. 2. Lamarck t. 283. f. *a*, *b*, *c*.—Body of the calyx naked; ſcales ſquare, tipped with radiating briſtles. Leaves linear-lanceolate, nearly ſeſſile.—Gathered by Oſbeck, on hills not far from Canton, flowering in September. The Chineſe call it by a name which is equivalent to *Plume of Golden Roſes*. It is ſold in their apothecaries' ſhops, being taken in infuſion for the colic, and uſed in fomentations for ſprains and ſwellings. The *root* is woody, perennial. *Stems* ſeveral, branched or buſhy, not above eighteen inches high, ſlender, ſquare, leafy, rough, with minute cloſe-preſſed briſtles. *Leaves* oppoſite, on very ſhort ſtalks, linear-lanceolate, acute, entire, rounded at the baſe, an inch or more in length, three-ribbed, rough, with depreſſed briſtles, as in *Melaſtoma*; dark green above; pale or yelloviſh beneath. *Flowers* terminal, uſually two together, ſeſſile, accompanied by ovate fringed *bracteas*. *Calyx* ovate, obſcurely ribbed, coloured, perfectly ſmooth and naked; teeth four, about as long as the body, lanceolate or oblong, at firſt erect, folding over each other in the form of a cone bearded at the ſummit, then ſpreading, and finally deciduous, their edges fringed with pale hairs; intermediate ſcales external with reſpect to the teeth, ſmall, quadrangular, each crowned with a radiating tuft of unequal, pale, ſomewhat compound briſtles, half the length of the teeth, all finally deciduous. *Petals* red, obovate, broad, nearly twice as long as the calyx. *Anthers* yellow, with a pale wavy beak. After all the other parts of the *flower* are fallen, the *germen* remains crowned with a little ſtalked tuft of ſhort radiating briſtles, which perhaps are the fringed ſcales mentioned in the generic deſcription of that part.

2. O. *zeylanica*. Ceylon Oſbeckia. Linn. Suppl. 215. Willd. n. 2. Ait. n. 1. Lamarck f. *d*. (Echinophora maderaſpatana, ſideritidis non ſerratis nervoſis foliis, fructu capſulari caucalidis æmulo; Pluk. Phyt. t. 173. f. 4.)—Briſtles of the calyx palmate, three-cleft, deflexed; ſcales linear, tipped with radiating briſtles. Leaves elliptic-lanceolate, ſtalked.—Native of Ceylon, from whence it was procured by ſir Joſeph Banks, in 1799, for Kew garden; it flowers about July in the ſtove, and is biennial. *Root* of a few ſmall zigzag fibres. *Stem* ſolitary, a ſpan high, ſlightly branched, ſquare, with briſtly angles. *Footſtalks* about a quarter of an inch long, briſtly. *Leaves* thinner, broader, more elliptical, and paler than in the firſt ſpecies, not well repreſented in the above figures. *Flowers* from one to five at the tops of the ſtem or branches, the lower ones on ſhort ſmooth axillary *ſtalks*. Body of the *calyx* pale, with eight ſtrong ribs, along which are ranged ſeveral minute ſcales, each bearing three widely ſpreading ſlender briſtles; teeth four, oblong, ſingle-ribbed, elegantly pectinate

tinate at the edge, not ſo ſoon deciduous as in the former; ſcales linear, narrow, crowned with a radiant orbicular tuft of ſimple briſtles.

Gærtner's figure, marked *O. hirta*, which he thought might belong to this or the foregoing, has certainly nothing to do with either, the *calyx* being five-cleft, without intermediate ſcales, and its briſtles ſcattered and ſhort.

We have a ſpecimen, gathered at Sierra Leone by the celebrated Dr. A. Afzelius, which agrees exactly with the original ones of *O. zeylanica*, except that the *flowers* are five-cleft and decandrous, as in all the following. We conſider it nevertheleſs as a mere variety.

*** Flowers five-cleft, with ten ſtamens.*

3. *O. antennina.* Briſtle-ſcaled Oſbeckia.—Body of the calyx naked; ſcales linear, longer than the teeth, fringed with diſtant briſtles. Leaves ovate, five-ribbed—Gathered by Dr. Afzelius, at Sierra Leone. *Stem* branched, ſpreading, ſquare, briſtly. *Leaves* ovate, about two inches long, light green, thin, very briſtly, with five ribs; their *ſtalks* about half an inch long, clothed with remarkably numerous, ſpreading, long, and ſtout briſtles. *Flowers* ſituated as in both the foregoing, but larger, and on longer ſtalks. Body of the *calyx* quite ſmooth and naked, very obſcurely ribbed, green, with a purpliſh tinge; teeth five, as long as the body, ovato-lanceolate, taper-pointed, pale green, tinged with purple, furniſhed with many fine ribs, the edges fringed with ſhort briſtles, the point tipped with a few long ones; ſcales rather longer than the teeth, linear, very narrow, purpliſh, fringed with long very diſtant briſtles, three of which crown the ſummit. The *petals* ſeem to be white or yellowiſh.

4. O. *rotundifolia.* Round-leaved Oſbeckia.—Briſtles of the calyx numerous, ſtellated; ſcales linear, tipped with radiating briſtles. Leaves roundiſh-ovate, three-ribbed.—From Sierra Leone.—The *branches* are reddiſh and hairy. *Leaves* about an inch long, remarkably broad, with only three ribs. *Footſtalks* half as long, very hairy. *Calyx*, in the only flower we have ſeen, almoſt globoſe, pale, purpliſh; its body clothed with copious, entangled, ſtellated briſtles; teeth five, linear-lanceolate, obtuſe, recurved, half the length of the body, copiouſly fringed and bearded; ſcales linear, very like the teeth, but much narrower, the terminal briſtles more radiating.

5. O. *tubuloſa.* Long-necked Oſbeckia.—Calyx minutely briſtly; its neck tubular, elongated; body clothed with ſtellated briſtles; ſcales linear, tipped with radiating ones. Leaves ovate, pointed, five-ribbed.—From Sierra Leone.—*Leaves* larger than in the laſt, of a broad-ovate, taper-pointed figure, with five ribs; both ſides hairy; the under much the paleſt. *Flowers* four or five, in a looſe terminal ſpike. *Calyx* ovate, with a cylindrical neck as long as the body, every part, even the teeth, denſely clothed with minute, ſcattered, pale, yellowiſh, depreſſed briſtles, beſides which the body is covered with large ſtar-like tufts of roughiſh, long, ſpreading briſtles, of the ſame hue. *Scales* linear, half as long as the five teeth, but much narrower, and tipped like them with radiating browniſh briſtles.

6. O. *grandiflora.* Large-flowered Oſbeckia.—Briſtles of the calyx tufted, unequal; ſcales linear, ſhort, tipped with radiating briſtles; teeth four times as long, obtuſe. Leaves ſeſſile, oblong. Panicle forked.—Native likewiſe of Sierra Leone. A much larger plant than any of the foregoing. *Stem* and *branches* hairy. *Leaves* nearly or quite ſeſſile, in diſtant pairs, elliptic-oblong, five-ribbed, hairy, bright green, ſomewhat recurved. *Flowers* about ſeven in a terminal, forked, hiſpid, leafleſs panicle, very large and handſome, purple, with yellow *anthers*. *Bracteas* ovate, obtuſe, fringed, deciduous. *Calyx* nearly cylindrical, its body deſtitute of minute depreſſed briſtles, but clothed with numerous, tranſverſe, oblong tufts, of long unequal ſpreading ones; teeth five, oblong, blunt, broad, nearly as long as the body, veiny, coloured, ſmooth, except a fine marginal fringe, and a thick tuft of unequal terminal briſtles; ſcales linear, a quarter the length of the teeth, ſmooth, crowned with an exactly ſimilar briſtly tuft. *Petals*, *ſtamens*, and *ſtyle*, about thrice as long as the calyx-teeth. This magnificent ſpecies would be a great acquiſition to our ſtoves. It appears to be herbaceous, but we have no account of its whole ſtature, or duration.

7. O. *multiflora.* Many-flowered Oſbeckia.—Briſtles of the calyx ſcattered, moſtly ſimple,; teeth linear, obtuſe. Leaves ovate, five-ribbed, ſtalked. Spikes aggregate.—This alſo was brought from Sierra Leone. It has the habit and inflorescenee of a *Melaſtoma*. The *leaves* are ſtalked, two or three inches long, broad-ovate, pointed, rough with depreſſed briſtles, and furniſhed with five, ſometimes ſeven, ribs; their under ſide paleſt. *Spikes* terminal, about three together, each ſimple, racemoſe, of from three to ſix *flowers*, briſtly. We have ſcarcely ſeen the *flowers*, except one bud, in which the teeth of the *calyx* appear to be linear, ſmooth, with a radiating tuft of terminal briſtles; the intermediate ſcales we have not ſeen, but we obſerve the ſcars where they have been, on ſeveral advanced ſpecimens of the *calyx*, which is there ovate, with a ſhortiſh neck, and five marginal notches where the teeth and ſcales have ſtood. Its body is clothed with numerous, ſhort, ſcattered, upright or inflexed, yellowiſh briſtles, moſtly ſimple, but a few towards the top are gathered into palmate tufts. The *capſule* is firmly coated with the body of the calyx, but the tubular neck riſes altogether above it. This can hardly be Gærtner's *O. hirta*, though more reſembling it than any that has fallen in our way.

We truſt our learned friend Afzelius, to whom we are obliged for ſpecimens of the laſt five ſpecies, will pardon us for anticipating his publication of them; as our only deſign in doing ſo, after having kept them by us fifteen years, is to commemorate his diſcoveries, and to add freſh laurels to his diſtinguiſhed countryman's fame. Theſe new ſpecies confirm the genus and its characters, which have hitherto been ſo imperfectly known, that it has been in ſome danger of abolition. Juſſieu knew *Oſbeckia* merely from Linnæus, and Lamarck has adviſed its conjunction with *Melaſtoma*, the impropriety of which will ſufficiently appear from all we have ſaid. S.

OSBORN, Francis, in *Biography*, an ingenious Engliſh writer, ſon of ſir John Oſborn of Chickſand, Bedfordſhire, was born in 1589. In early life he frequented the court, and became a retainer of the Pembroke family, and finally maſter of the horſe to William earl of Pembroke. During the civil contentions of Charles I. he took part with the parliament, under which, and under Cromwell, he held ſome public employments. In the latter part of his life he reſided at Oxford, in order that he might ſuperintend the education of his ſon, and print ſome of his works. He died in February 1658—9. The work by which he is beſt known is his "Advice to a Son," of which the firſt part was printed in 1656, and the ſecond in 1659. It conſiſts of maxims and directions upon a variety of topics, highly important in the right conduct of life, delivered chiefly in the ſententious manner. From this work, the author of the article in the Biographia Britannica has made large extracts, which exhibit the talents of Mr. Oſborn in a ſtriking point of view. There is, however, a certain freedom in his expreſſions, and in many of his ſentiments, that ill-accorded with

with the taſte of the time, and he was charged with Atheiſm. The vice-chancellor of Oxford was urged to cauſe the book to be publicly burnt, which he refuſed; but an order was procured to prohibit the ſale of it, which, in fact, greatly increaſed its popularity. "This writer," ſays his biographer, "has been cited as giving an opinion in preference of a public education over a private one. In fact, he was ſenſible of what he had loſt by eſcaping the diſcipline of a public ſchool, but perhaps he did not ſo well compute the advantages that he had gained by the domeſtic plan of education; and theſe perſonal and individual conſequences ſeem to have influenced moſt of thoſe who have treated on the ſame ſubject." His other publications were various tracts upon political topics; *viz.* "Hiſtorical Memoirs on the Reigns of Queen Elizabeth and King James;" "A Miſcellany of ſundry Eſſays, Paradoxes, and problematical Diſcourſes, Letters, and Characters; together with Political Deductions from the Hiſtory of the Earl of Eſſex, executed under Queen Elizabeth." Biog. Brit.

OSBORNE, Peregrine, *Duke of Leeds*, was the third ſon of ſir Thomas Oſborne, bart., afterwards created baron Kiveton, viſcount Latimer, and earl of Danby, by king Charles II., and raiſed by king William to the dignities of marquis of Carmarthen and duke of Leeds. Peregrine, the ſubject of this article, was called up, by writ, to the houſe of peers, and took his ſeat in that aſſembly on the 19th of March 1689-90, by the title of lord Oſborne of Kiveton. He appears to have entered the naval ſervice of his country in early life, to have ſerved as volunteer on board divers ſhips, and was, on the 2d of January 1691, appointed commander of the Suffolk. He continued as a private captain till July 1693, having, in the intermediate time, greatly diſtinguiſhed himſelf at the battle off La Hogue. In the early part of the year 1693, he was appointed commander of the Royal William, a firſt rate of a hundred guns, and on the 12th of July, of the ſame year, was promoted to be rear-admiral of the red. In the following year he ſerved under lord Berkeley as rear-admiral of the blue, and requeſted the command of the detachment ordered to attack Breſt. This was thought to be one of the moſt deſperate undertakings ever allotted to any commander, and the ſteady reſolution which he manifeſted in carrying his orders into execution, reflects on him a greater honour than could have been acquired in a leſs arduous undertaking by the moſt brilliant victory. Having ſhifted his flag into the Monk, he led his detachment, and ſaw his ſhips poſted in the ſeveral ſtations aſſigned to them. The ſervice was attended with the greateſt danger; for they were not only very warmly received by a number of batteries of heavy cannon and mortars; but as ſoon as the Monk and the other ſhips had brought up, three heavy maſked batteries, of which the aſſailants were perfectly ignorant, ſuddenly opened upon them, and rendered their utmoſt exertions of no avail. The commander had on this occaſion a very narrow eſcape, a ſhell burſting in the ſhip, killing a marine who ſtood cloſe to him. After his return from this unfortunate expedition, he was appointed to command the fleet which convoyed the king from Holland. In 1697 he was appointed colonel of the firſt regiment of marines; it does not, however, appear that he had any ſubſequent command, but received the regular promotions, till he attained in 1708 the higheſt rank in the ſervice, *viz.* admiral and commander-in-chief of the fleet. In 1712 he ſucceeded his father as duke of Leeds, and died in June 1729, in the ſeventy-firſt year of his age. Sharnock's Biographia Novalis, vol. ii.

OSCARI, in *Geography*, a town of Sardinia; 23 miles S.E. of Caſtel Aragoneſe.

OSCASATO, a town of Italy, in the department of the Upper Po; 12 miles N.W. of Cremona.

OSCHA, a river of Ruſſia, which runs into the Irtiſch, oppoſite to Melanova, in the government of Tobolſk.

OSCHATZ, or Ozzek, a town of Saxony, in the margraviate of Meiſſen, containing three churches, a college, and ſome manufactures of cloth; 16 miles N.W. of Meiſſen. N. lat. 51° 18'. E. long. 13° 5'.

OSCHEOCELE, from οσχεον, *the ſcrotum*, and κηλη, *a ſwelling*, in *Surgery*, a ſcrotal hernia. See Hernia.

OSCHERSLEBEN, in *Geography*, a town of Weſtphalia, in the principality of Halberſtadt, on the Bode; 10 miles N.N.E. of Halberſtadt. N. lat. 50° 2'. E. long. 11° 28'.

OSCHETZKA, a town of Pruſſia, in the palatinate of Culm; 23 miles E. of Culm.

OSCHOPHORIA, in *Antiquity*, feaſts inſtituted by Theſeus, in acknowledgment for his having deſtroyed the Minotaur, and by that means freed his country, Athens, from the tribute of ſeven young men, who were to be ſent every year into Crete, to be devoured by that monſter. The word is formed from the Greek οσχη, *branch of a vine laden with grapes*, and φερω, *I bear*. Plutarch ſays, they were ſo named, becauſe inſtituted by Theſeus at his return to Athens, which happened to be at the time of vintage. Some ſay, the Oſchophoria were inſtituted in honour of Minerva and Bacchus, who had aſſiſted Theſeus in his enterprife. Others, that they were in honour of Bacchus and Ariadne.

To celebrate the Oſchophoria, the young people, who had fathers and mothers alive, ran to the temple of Bacchus and that of Minerva, with grapes in their hands. He, who arrived there firſt, was the conqueror, and was to perform the ſacrifice, by pouring out of a phial a mixture of wine, honey, cheeſe, flour, and oil.

OSCILLA, ſmall images of wax or clay, made in the ſhape of men or women; which were conſecrated to Saturn, in order to render him propitious.

OSCILLATION, in *Mechanics*, *vibration*; or the reciprocal aſcent and deſcent of a pendulum.

Oscillation, *Axis of*, is a right line, parallel to the apparent horizontal one, and paſſing through the centre; about which the pendulum oſcillates. See Pendulum.

M. Huygens's whole doctrine of oſcillation is founded on this hypotheſis, that the common centre of gravity of ſeveral bodies, connected together, muſt return preciſely to the ſame height whence it fell; whether thoſe weights return conjointly, or whether, after their fall, they return ſeparately; each with the velocity it had then acquired.

This ſuppoſition was oppoſed by ſeveral, and very much ſuſpected by others. And ſome, who inclined to believe it true, yet thought it too daring to be admitted into a ſcience which demonſtrates every thing.

At length M. James Bernouilli demonſtrated it by ſtrict geometry, by referring the weights to a lever; and publiſhed in the Mem. Acad. of Scien. of Paris for the year 1703. After his death, a more eaſy and natural demonſtration of the centre of oſcillation (ſee Centre *of Oſcillation*,) was advanced by his brother, and publiſhed in the Mem. of the ſame Academy, for the year 1714: the ſubſtance whereof may be conceived as follows:

A ſimple pendulum of a determinate length and weight, raiſed to a determinate height, whence it is to fall till it recovers its vertical line, employs in that fall, or demi-vibration, a determinate ſpace of time, which can never poſſibly be either greater or leſs. Which time is neceſſarily ſuch, becauſe the agitative force, *i. e.* the force which produces

the motion of the pendulum, is determined in every thing that concurs to the formation thereof: ſo that it can only cauſe one certain effect.

The agitative force of the pendulum ariſes from three things: 1. The power or momentum of gravity. 2. The maſs or body tied to the end of the inflexible rod. 3. The diſtance of that body from the point of ſuſpenſion, or, which is the ſame, the length of the rod, or the pendulum.

Now, 1. The power of gravity, be the cauſe what it will, is that power, which makes a body fall, and that, *v. gr.* at the rate of $15\frac{1}{12}$ Paris feet in the firſt ſecond of time. It is viſible, then, that this force is the effect of a quantity, which determines thoſe $15\frac{1}{12}$ feet, and that a heavy body would paſs more or leſs ſpace in the ſame firſt ſecond, if the force of gravity were greater or leſs.

2. As that force is inherent in each point, or infinitely ſmall part of a body, the greater the body is, or the larger its maſs, the greater quantity of motion or force it has.

3. The diſtance of the moving body from the point of ſuſpenſion, or the length of the rod, is always the radius of a circle, of which the moving body deſcribes an arc; and of conſequence, the greater the radius is, *cæteris paribus*, the larger arc the body deſcribes. And, at the ſame time, the greater height it falls from, the greater velocity it acquires

Now, the agitative force of the pendulum is only that of the body faſtened to the end of the rod. So that it is the product of the force of the weight of the maſs of that body, and of its diſtance from the point of ſuſpenſion. The force of gravity, therefore, being always the ſame, and a body or weight, faſtened to the end of the rod, always the ſame, it is impoſſible, that two ſimple pendulums, of a different length, ſhould be ſo iſochronal, or ſhould make their vibrations in the ſame time; for by virtue of thoſe different lengths, the velocities will be unequal, and of conſequence, the times of their vibrations will be ſo.

But if it be ſuppoſed, that there are, in nature, different powers of gravity, it will then be poſſible, that two ſimple pendulums, of different lengths, ſhould be iſochronal; the one animated by the natural weight, the other by the imaginary one.

If the imaginary gravity or weight be greater than the natural one, the pendulum, imagined iſochronal to the natural one, will neceſſarily deſcribe a larger ſpace or arc in the ſame time; and of conſequence the weight will be faſtened at a greater diſtance from the point of ſuſpenſion. Though, to have an iſochroniſm, the two agitative forces of the two pendulums muſt be equal; yet, of the three things which compoſe theſe forces, there are always two greater in the imaginary than the real pendulum: the third, therefore, *i. e.* the maſs or ball, muſt be diminiſhed in the neceſſary proportion.

As the ſpace or arc deſcribed by the imaginary pendulum is greater than that by the natural pendulum, in the ſame ratio as the imaginary gravity is greater than the natural one, and a radius of that arc greater in the ſame ratio, are two things inſeparable; the two gravities will be always to one another, as thoſe two radii, or the two lengths of the two pendulums; which always gives the expreſſion of the imaginary gravity, and, by a neceſſary conſequence, that of a diminiſhed maſs or ball of the imaginary pendulum. If the power of gravity be imagined leſs than that of the natural one, it is eaſy to obſerve how it is to be taken; but that were needleſs in our deſign.

If now there be a compound pendulum, charged with two weights or balls faſtened to the ſame rod, M. Bernouilli conceives each of thoſe weights removed to a greater diſtance from the point of ſuſpenſion than it was before; but both to the ſame; and diminiſhed, in maſs, in a due proportion: ſo as that both together only make one ſimple pendulum, animated with one weight, the expreſſion of which is had, and iſochronal to the natural compound pendulum.

Thus, we ſhall have one ſimple natural pendulum iſochronal to the compound natural one, by having a ſimple natural pendulum iſochronal to the ſimple imaginary pendulum before found; which is very eaſy: ſince, as the imaginary gravity is to the natural, ſo is the length of the ſimple imaginary pendulum to the length of the ſimple natural pendulum; and it is there the centre of oſcillation is required.

We ſhould here take notice that Mr. Taylor, a celebrated mathematician of our own country, diſcovered about the ſame time with Mr. John Bernouilli, a ſimilar ſolution of this problem, and publiſhed it in his "Methodus Incrementorum." See PENDULUM.

OSCILLATION, *Centre of.* See CENTER *of Oſcillation.*

OSCINES, among the Romans, an appellation given to ſuch birds, from whoſe chattering or notes, omens and predictions were drawn. See ALITES.

OSCITATION, the act popularly called *yawning.*

OSCULA, in *Anatomy*, a term uſed for the orifices, or openings of the larger veſſels.

OSCULATION, in *Geometry*, is uſed for the contact between any given curve and its oſculatory circle; that is, the circle of the ſame curvature with the given curve. See CURVATURE.

OSCULATORY, in *Church Hiſtory*, a tablet, or board, with the picture of Chriſt, or the bleſſed Virgin, or ſome other of the ſaints, which, after the conſecration of the elements in the euchariſt, the prieſt firſt kiſſed himſelf, and then delivered to the people for the ſame purpoſe.

OSCULATORY *Circle*, in *Geometry*, is uſed chiefly by foreign mathematicians, for the circle of curvature; that is, the circle having the ſame curvature with any curve at any given point. See CURVATURE.

OSCULATORY *Parabola.* See PARABOLA.

OSCULATORY *Point*, the point of contact between a curve and its oſculatory circle. See CURVATURE.

OSCULUM, in *Analytical Geometry.* See CURVATURE and EVOLUTE.

OSCULUM *Pacis.* Anciently it was a cuſtom in the church, that, in the celebration of maſs, after the prieſt had conſecrated the water, and ſpoken the words, *Pax Domini vobiſcum*, the people kiſſed each other; which was called *oſculum pacis.*

When this cuſtom was abrogated, another aroſe; and, while the prieſts ſpoke the words, a deacon, or ſubdeacon, offered the people an image to kiſs; which they called *pacem.*

OSEMANPOUR, in *Geography*, a town of Bengal; 20 miles E. of Burdwan. N. lat. 23° 11′. E. long. 88° 20′.

OSEN, a town of Norway, in the dioceſe of Drontheim; 56 miles N. of Drontheim.

OSENOKA, a river of Ruſſia, which runs into the Kolima, N. lat. 64° 15′. E. long. 148° 14′.

OSER, a river of Ruſſia, which runs into the Oka, 20 miles N.N.W. of Riazan.

OSERO, an iſland in the Adriatic, near the coaſt of Dalmatia, ſeparated by a narrow ſtrait from the S.W. end of the iſland of Cherſo; about 15 miles long, and from two to five broad. The air of this iſland is peſtilential in the heat of ſummer, which is owing to pools of brackiſh water, that ſtagnate for want of an outlet, and become putrid. Their

city,

city, which is well ſituated in the iſland, and which was formerly populous, is nearly ruined, and become almoſt uninhabitable, by an exiſting evil, which, if the inhabitants had not been both indolent and poor, might have been eaſily removed. Several good benefices are annexed to the church of Oſero, which have been ſhamefully miſapplied, inſtead of being employed for the relief of the inhabitants, and the improvement of the place. The cathedral of the church, in this depopulated city, is a ſolid fabric, with a magnificent ſteeple, of no mean architecture. The Saracens deſtroyed and burnt this place about the year 840, and it has never ſince been able to recover itſelf. The coaſts of the iſland abound with ſardines and mackrel. N. lat. 44° 56′. E. long. 14° 35′.—Alſo, a town of Dalmatia, capital of the above iſland, the ſee of a biſhop, ſuffragan of Zara.

OSFAN, or Asfan, a town of Arabia, in the province of Hedsjas; 35 miles N.N.W. of Mecca.

OSIANDER, Andrew, in *Biography*, was a native of Bavaria, and born in 1498. He ſtudied at Wittemburg and Nuremburg, and was one of the earlieſt diſciples of Luther, and, like his maſter, frequently declaimed with great applauſe and ſucceſs againſt the corruptions of religion as introduced into the papal ſyſtem of doctrine and worſhip. Nor did he ſtop here, but moſt zealouſly ſupported the reformer in his attacks on the power and juriſdiction of the Roman pontiff, and in his efforts to eſtabliſh a faith and diſcipline more confonant with the principles and precepts of the goſpel than thoſe of Rome. From this time he had a conſiderable ſhare in the controverſies and conferences which were held on the ſubject of religion. He took an active part at the conference of Marpurg in 1529, between Luther and the Swiſs divines, on which occaſion, however, he ſhewed that he thought and acted for himſelf; he ſpoke, after Luther, upon the ſubject of Juſtification, and maintained doctrines very diſſimilar from his. He was appointed miniſter and profeſſor at Konigſberg, where he became diſtinguiſhed for his peculiar notions on the ſubject of Juſtification, which he ſaid was effected in us by the union of God with our ſouls. This doctrine was oppoſed by many eminent doctors of the Lutheran church, but Oſiander was not to be deterred by any human authority, and juſtified himſelf with ſpirit, acuteneſs, and powerful talents, and his ſentiments were ſupported by perſons of conſiderable weight. He drew up a confeſſion of faith, which was printed by order of the duke of Brandenburg, but highly diſapproved by the Lutheran divines aſſembled at Augſburg. While he was preparing to maintain his doctrines, and to cruſh his opponents, he was attacked with an epileptic diſorder, which terminated his life in 1552. He wrote "Harmonia Evangelica;" "Epiſtola ad Zuinglium de Euchariſtia;" "Diſſertationes duæ, de Lege et Evangelio et Juſtificatione;" "Liber de Imagine Dei, quid ſit." He had a ſon Luke who was a Lutheran miniſter, and wrote an inſtitution of the Chriſtian religion, and other works, and who died at Tubingen in 1604; and there was another perſon named Luke Oſiander, who was chancellor of Tubingen, who died in 1638, and who left behind him a treatiſe "On the Omnipreſence of Chriſt as Man."

Osiander, Andrew, grandſon of the Andrew abovementioned, was born at Blauberen, in the duchy of Wirtemburg, in 1562, and became a Lutheran miniſter. He was diſtinguiſhed for his early genius, and attachment to letters, paſſing through the different courſes of academical ſtudy, with the moſt honourable teſtimonials from his ſuperiors. In 1584 he was appointed deacon of the church of Aurach; whence he removed in 1586, and was made paſtor of the church of Gigligen. Afterwards he was appointed preacher and counſellor to prince Lewis of Wirtemburg, and in 1592 he received the degree of doctor of divinity in the new ducal univerſity of Tubingen. In the year 1598, prince Frederic nominated him abbot of Adelberg, and ſuperintendant of the churches in that diſtrict. In 1605 he became paſtor of the church of Tubingen, and was inſtalled chancellor of the univerſity in that place. He died in 1617. He was the editor of "Biblia Sacra, Latinè vulgata, cum Emendationibus et Explicationibus ſuperiorum Verſionum, et Obſervationibus ex Theol. Andreæ, Herbrandi," which paſſed through five editions in a few years, and is highly commended by father Simon, in his Crit. Hiſt. of the Old Teſtament. He was likewiſe author of ſeveral theological works.

Osiander, John Adam, a Lutheran divine and profeſſor, was a native of Vayingen, in the duchy of Wirtemburg, and was a provoſt of the univerſity of Tubingen, where he died in the year 1697. He is known as the author of "Commentarius in Pentateuchum," in five volumes, folio; alſo of Commentaries on Joſhua, the book of Judges, Ruth, and the two books of Samuel; of "Diſputationes Academicæ in præcipua et maxime controverſa Novi Teſtamenti Loca," and other learned works.

OSIANDRIANS, in *Eccleſiaſtical Hiſtory*, a ſect among the Lutherans ſo called from Andrew Oſiander, a celebrated German divine.

Their diſtinguiſhing doctrine was, that a man is juſtified formally, not by the faith and apprehenſion of the juſtice of Jeſus Chriſt, or the imputation of our Saviour's juſtice, according to the opinion of Luther and Calvin; but by the eſſential juſtice of God.

Osiandrians, *Semi*, were ſuch among the Oſiandrians, as held the opinion of Luther and Calvin with regard to this life; and that of Oſiander, with regard to the other; aſſerting, that man is juſtified here by imputation; and hereafter by the eſſential juſtice of God.

OSICA, in *Geography*, a town of Poland, in the palatinate of Sandomirz; eight miles S.W. of Lucko.

OSIER, in *Botany*. See Salix.

Osier, in *Planting*, a particular ſort of willow which is often planted in moiſt boggy ſituations on the borders of rivers, for the uſe of the ſhoots in baſket-making and other purpoſes.

The following are the names and uſes of the ſpecies which are employed in the vicinity of Brentford, as ſtated in the Middleſex Report:

"1. The *ſalix vitallina*, or yellow willow, which is cultivated chiefly by the nurſerymen, and being of a tough yielding nature, is uſed for binding packages of trees and ſhrubs in the drawing ſeaſon, and for tying up the branches of wall and eſpalier trees.

"2. The *ſalix amygdalina*, or almond-leaved willow, which is a ſpecies of which there are ſeveral varieties, one of which is called by the planters 'the ſmall red willow,' or 'binding rod;' it being chiefly uſed for binding the produce of garden-grounds. Another kind of this willow is at preſent known by the looſe appellation of the 'new kind;' it is of large growth, and produces a great crop; is uſed both by the baſket-makers and the corn ſieve-makers, and is fit for any work which requires a firm as well as a tough rod.

"3. The *ſalix viminalis*, or oſier willow. Of this ſpecies there are alſo ſeveral varieties, which are called among the planters by the name of 'the yellow and brown oſiers,' or 'Coomb's oſiers.' They are chiefly uſed by the baſket-makers, being very pleaſant working rods, and, as they produce a great crop, are much cultivated.

" Theſe three deſcriptions comprehend the moſt uſeful varieties, and the moſt profitable in point of crop, of any that are cultivated in that diſtrict. There is, however, a coarſe ſort of willow, known by the name of 'the Spaniard;' but whether it is a diſtinct ſpecies or not is not decided; it might be rendered extremely uſeful in counties where much bruſh or underwood is bound."

Mr. Young ſays " February is the proper time to plant oſiers and other ſorts of willows. No part of the farmer's buſineſs pays better than ſuch plantations, eſpecially if he has any low, ſpongy, boggy bottoms near a ſtream. The land ſhould be formed by ſpade-work into beds, ſix, eight, or ten feet broad, by narrow ditches; and if there is a power of keeping water in theſe cuts at pleaſure by a ſluice, it is in ſome ſeaſons very advantageous to do ſo." John Phillips, eſq. of Ely, ſtates in the ſixteenth volume of the Tranſactions of the Society of Arts, &c. that he has " made many experiments on different ſoils, with the view of aſcertaining which are moſt appropriate to oſier plantations; and which, of the almoſt infinite variety of oſiers, are beſt adapted to the different ſoils; but as his plantations are *chiefly* in the fens, he has directed his attention more particularly to determine what ſpecies of oſiers are moſt profitable in a black peat ſoil, and which is the moſt advantageous way of planting them, and at what ſeaſon of the year. It would have been of much public utility if the baſket-makers had given a ſpecific deſcription of the beſt kind of oſiers, the planting of which they wiſhed to be encouraged by premiums. The planters would in that caſe have procured thoſe only; much expence would have been ſaved to other gentlemen as well as himſelf, and a very conſiderable addition would have been made in the plantations to the ſtock of the beſt oſiers which are imported from abroad. As we have no generic or ſpecific terms, he will endeavour to give a plain vulgar account of thoſe only which are ſelected by the moſt experienced planters in his neighbourhood. Oſier, in common, is a word of very indeterminate ſignification; it is certainly a ſpecies of the ſalix, but admitting of many varieties. He has endeavoured to reduce them to two claſſes; firſt, thoſe which are ſo called by the growers and baſket-makers, diſtinguiſhable by their more blunt, mealy, or downy leaf; and ſecondly, thoſe that have a leaf more pointed, ſmooth, and green, reſembling that of a myrtle. Of the firſt claſs he has nine or ten varieties, all of which he ſhall eradicate, ſave one, *viz.* that which is called the *grey*, or *brindled oſier*. It has, in common with the others, the light-coloured leaf, but is known by having its bark ſtreaked with red, or blood colour. It has not been long introduced into this country. It grows vigorouſly, is very hardy and tough, and bleaches well. All the others of the firſt claſs delight in a wet ſoil, and will flouriſh even in the moſt barren kind of peat; but they are coarſe and ſpongy, have a large pith, are brittle, and very periſhable; they are, however, uſed ſometimes for the ſtouter parts of large baſkets, and unpeeled for wine-hampers. They grow quick and large, and a ſmall number will fill the ell bunch, by which all oſiers are ſold; they are profitable to thoſe growers only who live near London, or whoſe plantations are contiguous to water-carriage. He has ſome acres of them; and were he to ſend them there by waggon, which is the only mode of conveyance, they would not pay for the carriage. In time of war, when our intercourſe with France and Holland has been interrupted, where they grow better ſorts, they have been too much reſorted to, which has brought our baſkets into diſrepute, and leſſened the demand for them in foreign markets; this, together with the enhanced price of inſurance, accounts for the fact, that war makes oſiers in this kingdom both dear and cheap; that is, dear at the commencement for want of importation, and cheap during its progreſs, for want of exportation, after having been manufactured into baſkets and other works, to which they are applied."

And " of the ſecond claſs are, 1, the Welſh, both red and white; the red having the preference, and is ſaid to have been brought originally from Wales; they form an almoſt eſſential part of every plantation, as no other is fit to tie the bunches after the rods have been peeled and whitened. A bunch is formed by compreſſing the oſiers in an iron hoop or band, of an ell in circumference; eighty bunches make a load, which four years back ſold at 18*l.*; it is not now worth 12*l.* The beſt land will produce a load on an acre, but half a load is not a very bad crop on bad land. The expence of weeding, renewing, cutting, and peeling, is about 5*l. per* acre, when the buſineſs is well done; but they often go unweeded, when they are ſold at a low price, to the great decay of the plantations. The *Welſh* are alſo uſed to tie reed ſheaves for thatch; they are ſo bitter that cattle will not browſe them, unleſs driven to the extremity of hunger, and rats will not touch them, although they will deſtroy almoſt every kind of bandage. They were formerly grown for the coopers, to bind their hoops; but for this uſe they have long given way to the hazel; they are very tough and durable, and would rank with the beſt ſorts for the uſe of baſket-makers, were they of a better colour when peeled." And " 2. The *weſt country Spaniard*, which is ſuppoſed to have been firſt introduced into the weſt of England from Spain. It is very different from the *Spaniard*, which is a ſpecies of the larger willow, and uſed for hedging-wood and hurdles. In the Iſle of Ely it was long in high eſtimation, until others were introduced, ſuppoſed to be ſuperior in ſome of their qualities; the bark is of a blueiſh-grey colour; it grows ſtout and ſtately, and objects to no ſoil; the grower, however, urges againſt it what he thinks to be a ſtrong objection, *viz.* that it produces a ſmall crop. It bears, comparatively, only a few ſhoots on a head; this is certainly true; but what then? it is not ſo profitable. He admits it, provided only an equal number be planted on an acre with thoſe that bear more ſhoots; but why ſhould the grower tie himſelf to plant an equal number of different ſorts on a given quantity of land? The nurſeryman is governed by no ſuch rule; and the farmer would become an object of pity, were he to ſow an equal quantity of every ſort of grain on an acre. The planter and farmer ſhould be guided only by the burden which the land is capable of bearing. His experience teaches, that an acre of land will carry, of this ſort, 14,000 plants, with more eaſe than 12,000 of the beſt new kind. 3. He has not been able to learn where the *new kind* originated. It is well known every where; and although it muſt be much older in ſome counties than others, it is univerſally called by that name. There are, however, two ſorts; the other is called the *laſt*, or *beſt new kind*. The bark of the former is of a light brown colour; that of the latter reſembles ruſty iron, with light longitudinal ſtripes; it is on that account called, by ſome perſons, the *corderoy*. When the new kind was firſt introduced into the Iſle of Ely, it ſoon expelled moſt of thoſe of the firſt claſs; the few that are retained are uſed by the fiſhermen to make grigs, or twig tunnels, to catch eels and other fiſh: it ſtill maintains conſiderable reputation, but yields to the *laſt* new kind, which, beſides poſſeſſing moſt of the beſt properties, produces, on an average, at leaſt four ſhoots on the head more than any other, and it will grow well on a dry mellow ſoil. As its ſhoots are more numerous, a greater ſpace ſhould be allotted to it, to draw nouriſhment from the earth, and to admit the rays of the ſun and circulation of air, ſo neceſſary

neceſſary to the growth of every plant; 11,000 an acre is quite ſufficient on good land. But the beſt of all, conſidered in a public or political view, is, 4, the *French*. Under this name the *ground-ſetter* is, he ſuppoſes, frequently ſold; and he is informed, that it was ſo called, from its tendency, when neglected, to direct its ſhoots amongſt graſs and weeds, parallel with and near the ground; it is of the ſame quality, colour, and appearance with the French, except that it has at the point a tuft formed of leaves curled inwards, which has the appearance of a ſmall withered roſe-bud. You will eaſily know both from all others, thus: draw them through your fiſt from top to bottom, and the leaves will ſnap off with the brittleneſs of glaſs. The ground-ſetter grows very ſlowly, and is rejected by the planters on that account; the French, although more luxuriant, is alſo of comparatively ſlow growth; and it requires a great number to make up the bunch; but it is exceedingly taper, pliant, cloſe-grained, tough, and durable. The baſket-makers are more deſirous of it than any other, as it is beſt ſuited to make the ſmaller and finer baſkets, hats, fans, and other delicate articles. As it is much diſregarded by the planters in this kingdom, the baſket-makers, in times of peace, import vaſt quantities from France, the Auſtrian Netherlands, and Holland, where it is cultivated with great ſucceſs. It is ſingular, that it ſhould be imported cheaper than our planters can afford to grow it; the lands in France and Holland are much dearer than our fens. As an article of commerce, or as a raw material, it deſerves every encouragement that the public or individuals can give it; and if it be not ſo profitable to the grower, it is always of ready ſale."

He has alſo heard of another ſort, which is well ſpoken of, called the *red Kent willow;* but he is doubtful whether he is poſſeſſed of it or not; they have in this neighbourhood a very hard, tough willow, of a reddiſh colour, of which hurdles, cribs, &c. are generally made. He planted it laſt year, in foot-ſets, for the uſe of baſket-makers; but as the experiment is only in proceſs, he can ſay nothing of its utility.

*Planting*.—The following is the method of planting practiſed in theſe caſes, on the banks of the Thames, as deſcribed in the Tranſactions of the Society for the Encouragement of Arts, &c.

"The ground is dug during the winter a full ſpade's depth, and left rough, to prevent the tides from running it together again before it can be planted.

"The work begins in the month of March. The planter having procured the ſets or plants, which are fifteen or ſixteen inches long, cut diagonally off the ſtrongeſt ſhoots of the laſt year's growth, care being taken that they are not cut near to the top of the rods, that part being too porous to make a ſound plant, the ground is then marked out into rows two feet aſunder; and the ſets are ſtuck in the rows, eighteen inches from each other, leaving about ſeven inches of the ſets above the ground. This work is very eaſily done, without uſing even a dibble or a ſetting-ſtick; but, when planted, care muſt be taken, by hoeing, to keep them as free from weeds as poſſible; or if the ground be too wet for the hoe, a weeding hook may be uſed to keep them down: this is abſolutely neceſſary to enſure a good plantation. It is alſo equally neceſſary to keep the ground well drained, to prevent the tides remaining upon it any conſiderable time, for on that alſo depends the firmneſs and good quality of the rods.

The willows are cut over the firſt year with a bill-hook; the ſhoots are cut off cloſe to the ſtock and bound up in bundles, or boults, as they are called, which meaſure forty-two inches round, at ſixteen inches above the butt ends. The ſame proceſs of weeding muſt be purſued every ſummer; while they are ſhooting up from the ſtem. The next ſeaſon a cutting portion of them is left to ſtand another year, where large ſtuff is wanted for the ribs of large baſkets, &c.

"The planting of willows is expenſive in the firſt year; but if well managed they produce a great profit, as they improve in quantity every year."

But in regard to the moſt advantageous modes of planting, there is in the above volume of the Tranſactions of the Society of Arts, &c. a diverſity of opinion. The different qualities of ſoils are not ſufficiently attended to. A ſingle experiment is liable to deceive; what may hit or fail one year, may be the contrary the next. "It requires a diverſified ſeries of experiments to enable us to form a right judgment. The plantations of the year 1794, made on banks of ſoil thrown out of the ditches on each ſide, and thoſe made on the level ground, flouriſhed equally well that year. It was difficult to judge of them the next year, for they had been more or leſs injured by the vaſt inundation of all the fens of the Iſle of Ely, and which was not removed in many places until late in the ſummer; but in the third year the advantage was manifeſtly in favour of thoſe which had been made on banks or elevated beds. They have in this diſtrict from ten to fourteen inches of vegetating ſoil on the ſurface; immediately beneath it is a black or brown barren peat, of a looſe texture. In the drought of ſummer, when the moiſture is exhaled from the upper and more tenacious ſoil, the water inſtantly filters through the peat, and leaves the plants deſtitute of their beſt nouriſhment; but when the peat is thrown upon the ſolid earth, it will prevent the rays of the ſun from penetrating to the bottom; and when the water falls in the ditches, the lower and more tenacious ſoil will retain a ſufficient quantity of it for the uſe of the plants. Care ſhould be taken to inſert the ſets through the peat into this lower ſtratum; they will ſtrike their radicles the firſt year into this more ſolid earth; but when the peat has been meliorated by the ſun and air, and been compreſſed, and become more adheſive, they will ſtrike higher in the ſtem, until the radicles or fibres approach the ſurface. It muſt be admitted, that this is an expenſive method, and leſſens the quantity of land to be planted upon. To remedy this inconvenience, the writer lays out his land in beds or barrows, of eighteen feet wide; ditches of nine feet wide are dug on each ſide; the top of which, fourteen inches thick, is laid on the barrows; turf for fuel is then dug in the ditches, the expence of which is about 1*s*. 8*d*. a thouſand; they are ſold for 2*s*. 6*d*.

The beds or barrows, now conſiſting of about two feet and a half thick of ſolid earth, above the ſurface of the peat, are planted the following autumn, and produce good crops; when the water is ſufficiently low, he caſts upon theſe beds a fetid vegetable ſubſtance, vulgarly called bear's muck; it reſembles wet ſhag tobacco, and lies under the peat; it is extremely uſeful to the plants; and although it is, in its primitive ſtate, a perfect caput mortuum, when expoſed ſome time to the air it putrifies, affords mucilage, and becomes a good manure. In embanked diſtricts, ſubject to frequent and long inundations, two other advantages are obtained from theſe raiſed beds; the oſiers are thereby removed farther from the reach of the ice, which on a thaw floats into the lower plantations, and does them much injury. When the waters are high, in the cutting or planting ſeaſon, the beds are more acceſſible than the level ground; but having had the command of the water laſt ſummer, by a mill or engine, he dug out the peat into turf, having firſt

laid aſide the upper ſpit; the turf being removed, he ſhall return this ſpit into the ditch, and plant upon it; thus no ground will be loſt."

It is further ſtated, that "in the year 1796, he made an experiment on an acre of land of this quality; he ploughed one half of it, and the other half was dug with the ſpade, about fourteen inches deep; the ſod of that thickneſs was inverted by the ſpade. The plantation on the ploughed land was very weak, and failed in many places; that which followed the ſpade did better; but they are both ſo bad, that they muſt be renewed this year. On the former, the beſt land lay uppermoſt, which, when deprived by the heat of its moiſture, derived no aſſiſtance to ſupport the plants from the peat that lay underneath; on the latter, ſome of the beſt land was laid in the ground, but not deep enough to retain a ſufficient quantity of moiſture. The preceding year he planted in a piece contiguous, on banks as before deſcribed, and there the oſiers do well. And he has a rich loam lying on a bed of potters' clay; the ſituation is low, and expoſed to the water; French oſiers were very ſcarce, and he could procure only a few hundreds laſt year; determined to eke them out as far as he could, he laid them down in their whole length, and pegged them on the ground; they ſtruck good roots into the earth, and threw out abundant ſhoots. This experiment, together with that of planting upon banks, will enable him to anſwer the queſtion often aſked, 'Of what length ought the ſet to be?' It depends entirely upon the nature and ſituation of the land. There ſhould be ſo much of it in the ground as to enable it to procure moiſture, and ſo much of it out of the ground as to make it acceſſible in the cutting ſeaſon, where much weeding is not required; and where there are no floods, or where they ſubſide quickly, there ought to be very little of it out of the ground. The nouriſhment, in that caſe, will paſs immediately from the roots to the rods or ſhoots, without the burden of firſt ſupplying the head or ſtock."

*Seaſon of Planting.*—In reſpect to the time of planting, every experiment he has made confirms the opinion, that the "autumn, and not the ſpring, is the moſt proper ſeaſon for planting. Thoſe who think with him ſay, that the fall of the leaf indicates the proper time to cut the ſets; it certainly is ſo in general; but the leaf of the oſier, like that of the oak and other trees, will ſometimes prolong its departure. The ſtagnation of the juices is the true criterion by which to judge, not on account of the ſet, but of the trunk, leſt, if you amputate it whilſt the juices are in circulation, it ſhould bleed to death. He has planted in the firſt week of October, and the ſets appeared to remain torpid for the remainder of the year; about Chriſtmas he took up ſeveral of them, and was much pleaſed to find that they had ſtruck root, although they had given no outward appearance of vegetation from the time of planting. It is probable that the earth retains a ſufficient portion of the ſummer heat until the autumn, to give life to plants at the root, when the atmoſphere may at that time be ſo cold as to diſcourage any exertions above-ground; and perhaps nature may be more vigorous when her operations are confined to one point. It is added that, when you plant in ſpring, the ſet ſeems (if he may ſpeak ſo figuratively) to have its attention diſtracted by two operations not very homogeneous, the one upwards, the other downwards. It is impelled to ſhoot its radicles into the earth, to form its ſtability, and procure ſuſtenance; and it is called upon at the ſame time to put forth its leaves and branches. To ſpeak without a figure, the prolific ſun and air induce it to exhauſt the juices, in extending the ſhoots before the roots are ſufficiently ſtrong and large to ſupply the drainage; hence it is that, contrary to the commonly received opinion, a warm and dry ſpring is always injurious to the young plantations. If there be not ſufficient rain to convey ſuſtenance by the leaves and bark, in aid of the ſmall quantity procured by the root, the plant muſt die or dwindle, and it is very obſervable, that the firſt vigour of the late-planted ſet is a ſure prognoſticator of its decline or diſſolution. In the autumn of 1795 he made a ſmall plantation, and on the remainder of the piece he planted in March following. In the beginning of May, thoſe laſt planted were the forwardeſt, which, for a time, ſtaggered his opinion of the moſt proper time for planting; but in June, thoſe planted in the autumn had much the advantage, and have continued to grow well: thoſe that were ſet in the ſpring decayed in ſummer, and many of them died. When the fibres have been formed before the winter, or when a tendency to form them has been obſerved, by the ſwelling of the bark, and particularly at the eye, the plant is enabled to charge itſelf with a ſufficient portion of the juices to anſwer the demand of ſpring; the rule, therefore, which he lays down for himſelf, where no obſtructions are raiſed by the water, is to plant as early in the autumn as he can cut the ſets, without endangering the parent ſtock."

In the fifth volume of the Farmer's Magazine the following method is ſtated to be had recourſe to: in the fens many holts (as they are provincially called), or plantations of oſiers, are raiſed, which beautify the country, keep the ſtock warm in the winter, and provide much uſeful wood for baſkets, cradles, and all kinds of wicker-work, and alſo for cribs for cattle to eat ſtraw or hay out of, or to make ſtows or hurdles to fence in ſtacks, part lands, &c. &c.; or they make hedges that laſt four years well, and if allowed to grow five years, many of them would make fork-ſhafts for hay and corn. Theſe holts or plantations of oſiers are commonly made in the middle of the land, in the north and eaſt corners, and ſometimes at any end, ſide, or place, that appears moſt eaſy, or in any reſpect the moſt deſirable. The ſituation and ſize of the holts vary exceedingly. Sometimes they are made in the middle of lands, from 10 to 60 yards ſquare, and in others, in the ſides or ends of, from 1 yard wide to 11, and from 10 to 100 yards long.

The mode of planting is very ſimple; it is, firſt to dig the land from 6 to 12 inches deep, and then to prick down cuttings of four years' growth, and 18 inches long, at about three feet diſtance from each other. The ſoil ſhould be moor or clay, or any thing that is low and wet; if drowned half the year it will be but little the worſe.

Theſe holts or oſier plantations muſt be fenced round, either with dykes, which is the moſt common, or with hedges, as is the moſt convenient. The proper ſeaſon for making them (they ſeldom fail of growing at any time) is from the fall of the leaf till very late in the ſpring, and the ſets are very cheap. Such plantations are cut annually for baſkets, ſkeps, ſcuttles, cradles, and all kinds of wicker-work, but when the oſiers are kept for ſets, or to make hedging wood, or for ſtows or hurdles, they are cut only once in four years.

Wherever the farmer has lands that are ſuited to this ſort of cultivation, as there is a conſtant demand for ſuch articles, he ſhould never neglect making plantations, as nothing that he can put upon ſuch land will probably pay him ſo well.

Mr. A. Young ſtates, that "the late Mr. Forby, of Norfolk, knew the value of theſe plantations well for various purpoſes. Oſiers planted in ſmall ſpots, and along ſome of his hedges, furniſhed him with hurdle-ſtuff enough to make many dozens every year, ſo that he ſupplied himſelf entirely with that article, as well as with a profuſion of all ſorts of baſkets, eſpecially one kind that he uſed for moving cabbage-plants, for which purpoſe they were much better

than tumbling the plants looſe in a cart. The common oſier he cut for this purpoſe at three years, and that with yellow bark at four."

OSIMO, in *Geography*, a town of the marquiſate of Ancona, the ſee of a biſhop, anciently a city of Umbria, named "Auxinum;" 12 miles S.S.W. of Ancona. N. lat. 43° 38'. E. long. 13° 36'.

OSIO, Teodato, in *Biography*, is the author of a curious ſpeculative tract, publiſhed at Milan in 1637, entitled "L'Armonia del rendo parlare, con ragione di numeri Pitagorici diſcoperta da Teodato Oſio," or, the harmony of common ſpeech or ſimple proſe and verſe, eſtabliſhed by the power of arithmetic, of muſical ſpeculations, and the Pythagorean ratio of numbers.

We procured this little book with great eagerneſs, in hopes that we ſhould find ſome acute and ingenious reflections on recitative, with nice diſcriminations between common ſpeech, narrative melody, and air. But in the moſt ample and minute index we ever ſaw to ſo ſhort a tract, the word recitative never occurs. And, indeed, when this book was publiſhed, its forms and phraſeology were hardly ſettled. The new dramas, called operas, had only been performed occaſionally at the grand duke's court, and private repreſentations at Florence. So that in 1637, the reſt of Italy ſcarcely knew of the exiſtence of a *muſica rappreſentativa*, or recitative, which was neither ſinging nor ſpeaking, but the intermediate utterance or emiſſion of vocal ſound, between both. The firſt opera at Venice was performed in 1637, the preciſe period of ſignor Oſio's publication, which is written in an obſcure and myſterious ſtyle, bordering on pedantry; nor is it eaſy to ſay, after peruſal, what is the author's object.

Osio, in *Geography*, a town of Sweden, in Eaſt Gothland; 32 miles W.S.W. of Linkioping.

OSIRIS, in *Mythology*, one of the great gods of the Egyptians, to whom they paid their chief worſhip. Oſiris was ſuppoſed to repreſent the ſun, and Iſis the moon.

Some writers in theology have ſuppoſed, that all the other deities of the Egyptians were only attributes of Oſiris and Iſis. See Isis and Orus.

The worſhip of Bacchus among the Greeks was formed upon that of Oſiris, as we learn from many paſſages in Diodorus Siculus. (See Bacchus) Oſiris was among the Egyptians the ſymbol or emblem of the ſun, which was the firſt object of their idolatry, and Iſis was that of the moon; and it is ſaid that their names refer to thoſe luminaries, ſince in their language Oſiris denotes "one who ſees clear," and Iſis the "ancient," an expreſſion which among them ſignified the moon. All the learned agree, that the oxen Apis and Mnevis, conſecrated to Oſiris after his apotheoſis, were the ſymbols of the ſun. Thus, whether it was that the Egyptian prieſts, to cover the hiſtory of this prince from the eyes of the people, gave out that he was really the ſun, or whether acknowledging Oſiris to have been a mortal man who had governed Egypt, and conferred many bleſſings upon it, they were willing to paſs it upon the world, that his ſoul was gone to reſide in that orb, ſtill they agreed that he was now become that radiant luminary, who by the benign influences of his beams, diffuſes fertility and plenty over all, and that to him vows, prayers, and ſacrifices were to be addreſſed. Thus was the worſhip of Oſiris confounded with that of the ſun, and that of Iſis, with that which was paid to the moon. In this way the prieſts had found the art of making idolatry leſs groſs, by ſaying it was not a mortal man, but an eternal ſtar, which was the object of public adoration. It appears that the Egyptians ſometimes conſidered Oſiris and Iſis as real perſons, who had governed Egypt with conſummate wiſdom, and at other times as beings of an immortal nature, who had framed the world, and ranged matter into the form which it ſtill retains. Thoſe who ſuppoſe that they had been human perſons, agreed that they were brother and ſiſter; but they differ about their parents. The moſt common opinion is that reported by Diodorus Siculus, who ſays, that the Sun was the firſt who reigned in Egypt; that he was ſucceeded by Vulcan, and Vulcan by Saturn, who having married Rhea, his ſiſter, had by her Iſis and Oſiris. The Egyptian mythology with regard to theſe fancied deities is ſtated by ſome writers in the following manner. The Egyptians, ſeeing good and evil equally prevalent in the world, and not being able to conceive that a being eſſentially good ſhould be capable of permitting evil, and much leſs be the author of it, were the firſt who invented two principles, the one good, the other bad, and introduced this error which afterwards ſo generally prevailed. The good principle they repreſented under the name of Oſiris, and the bad one under that of Typhon; hence ſprung the wars and perſecutions of the latter againſt his brother, whom he afterwards cut off. As they attributed all the evil that exiſted in the world to Typhon, ſo they conſidered Oſiris as the author of all the good. The creation of the world, for a long time diſputed and retarded by the machinations of the evil principle, together with the order and harmony that prevailed in it, was the work of Oſiris; and all the wars and troubles, and kinds of evils that ravage the univerſe, proceeded from Typhon. The good principle, according to the repreſentation of Plutarch, founded on ancient traditions, poſſeſſed three qualities, of which the one performed the office of father, and this was Oſiris; the other that of mother, who was Iſis; and that of ſon, who was Orus, the firſt production of the father and mother. (See Orus.) Some authors have alleged that Oſiris was Joſeph, and others maintain that he was Moſes; whilſt it is aſſerted by others, that this king of Egypt was more ancient than they, and that his worſhip was eſtabliſhed in their time through all Egypt, ſince the Iſraelites imitated its ceremonies in the adoration of the golden calf.

Banier is of opinion, that Oſiris is the ſame as Mizraim, the ſon of Ham, who peopled Egypt ſome time after the deluge, and who, after his death, was deified; and he is called by the ancients the ſon of Jupiter, becauſe he was the ſon of Ham, or Hammon, whom he himſelf had acknowledged as a god. Marſham takes Oſiris to have been Ham himſelf, known under the name of Menis at the head of the dynaſties, which ſucceeded to the gods and demigods. Indeed the learned in general allow, that Oſiris was one of the firſt deſcendants of Noah by Ham, and that he governed Egypt, whither his father had repaired, and there founded a ſmall kingdom, a few years after the diſperſion which happened in the time of Peleg. Diodorus aſſerts, that this prince is the ſame with Manes, the firſt king of Egypt; and perhaps at his apotheoſis his name was changed to that of Oſiris. For other particulars we refer to the article Isis.

The learned Jablonſki deduces the term Oſiris from Oſchiri, denoting "he who makes time." Accordingly it is alleged, that the Egyptian aſtronomers, after repeated obſervations, regulated the year by the courſe of the ſun; that the ſolar year was eſtabliſhed by the academy of Heliopolis, 1325 years B. C., 320 after the departure of the Iſraelites; and that the prieſts, who till that time had honoured the ſun under his proper name of "Phrá," beſtowed on him, in commemoration of ſo important an event, that of Oſiris, or author of time. Savary's Letters in Egypt, vol. ii.

OSITH, or Osyth, *St.*, in *Geography*, an iſland of England,

land, at the mouth of the Blackwater river, or Malden water, in the county of Eſſex, with a village. It is ſaid to have changed its name from Chiche to that of St. Oſith, who was a virgin, murdered here by the Danes, and canonized. A monaſtery of black Auguſtine canons was founded here to her memory by Richard Beaver, biſhop of London, in the year 1120. In 1801 St. Oſith contained 1268 inhabitants; 11 miles S.E. of Colcheſter.

OSIUS, in *Biography*, biſhop of Cordova, in Spain, was born in 257. He became the friend of Conſtantine, who by his perſuaſions convened, in 323, the council of Nice, where Oſius preſided. Under the emperor Conſtantius he was ſo much perſecuted, that he turned Arian. It ſhould however be mentioned, that he was then very aged, being almoſt, or entirely, 100 years old. Having made his recantation, he was permitted to return to his dioceſe, where he died ſoon after, extremely penitent, and in his laſt moments renounced the Arian hereſy with great fervour.

Osius, Felix, a learned Italian, was born at Milan in 1587, and became profeſſor of rhetoric at Padua, where he died in 1631. His principal works are, 1. Romano-Græcia. 2. Tractatus de Sepulchris Epitaphiis Ethnicorum et Chriſtianorum. 3. Elogia Scriptorum illuſtrium; and ſeveral other works, in high eſtimation at the period in which he flouriſhed.

OSKIN, in *Agriculture*, a provincial word uſed to ſignify an ox-gang; or a quantity or ſhare of common field-land, proportioned probably to the ſize of the fields and number of meſſuages in the given townſhip, at the time the fields were ſet out or appropriated among the houſes.

OSKIPARO, in *Geography*, a town of Perſian Armenia; 36 miles N.W. of Kanja.

OSKOL, a town of Ruſſia, in the government of Kurſk; on the river Oſkol; 60 miles S.E. of Kurſk. N. lat. 50° 50′. E. long. 37° 14′.

OSKOVA, a mountain of Boſnia; 20 miles S.E. of Serajo.

OSLAWA, a town of Moravia, in the circle of Brunn; 12 miles W. of Brunn.

OSLEOM Iron, in the *Wire Works*, a particular ſort of bars of iron, wrought on purpoſe for the manufacture of iron wire. Theſe are ſmall and ſquare, and the firſt thing done with theſe, towards the making them into wire, is the ſtraining, or drawing them at a furnace to ſmall rods, of the thickneſs of one's little finger; theſe they bow round, and deliver them to the wire-drawers. See Wire.

OSMA, in *Geography*, an almoſt ruined town of Spain, in Old Caſtile, on the Duero, the ſee of a biſhop. In the year of Rome 682, it took part with Sertorius, and was deſtroyed by Pompey. In 931, the Moors were defeated here by the Chriſtians; 40 miles S.E. of Burgos. N. lat. 41° 45′. W. long. 2° 58′.

Osman, Topal, in *Biography*, a diſtinguiſhed Turkiſh general, was born in 1673. He was brought up among the youth of the ſeraglio deſtined to public employments, and by his proficiency in learning languages, and in military exerciſes, and his amiable diſpoſition, obtained the eſteem of his maſters. He was appointed ſuperintendant of the carriages, and in 1698, or 9, he was ſent to Cairo with a meſſage from the emperor. In his paſſage the veſſel in which he had embarked was attacked by an Algerine cruizer, and taken after an action, in which Oſman, while fighting with great bravery, was dangerouſly, but not mortally, wounded in the arm and thigh. The conſequences of the latter wound rendered him lame for life, and obtained for him the name of *Topal*, which ſignifies *halting*. The prize was carried into Malta, where it was viſited by Vincent Arniaud, a native of Marſeilles, then poſt-captain. Oſman, on his coming on board, ſaid to him, "Do a generous action—ranſom me—you will be no loſer by it." Arniaud aſked the captain what he demanded for the ranſom of this ſlave, to which the captain replied, "a thouſand ſequins." Arniaud now turned to Oſman; "I," ſaid he, "never ſaw you before in my life; I know nothing of you, and you aſk me to pay a thouſand ſequins for you on your bare word." "Both of us," ſaid Oſman, "act in character. For myſelf, I am in fetters, and it is natural that I ſhould employ every means to regain my liberty. You naturally diſtruſt my faith. I have no ſecurity to give but my word, in which you have no reaſon to confide; if, however, you will run the riſk, you will not repent it." Arniaud immediately agreed with the captain for five hundred ſequins, which he paid down, and putting Oſman on board a bark of his own, ſent him medical aſſiſtance, and afforded him every means neceſſary for his recovery. When perfectly recovered, Ofman propoſed to write to Conſtantinople for remittances to pay the debt, and deſired to be diſmiſſed upon his parole. Arniaud immediately allowed him to take the bark, and diſpoſe of it as he pleaſed. He immediately ſet ſail for Damietta, whence he aſcended the Nile to Cairo. He there paid to the captain a thouſand ſequins, on account of his benefactor, and made him a handſome preſent for himſelf. He executed his commiſſion, returned happily to Conſtantinople, and was himſelf the bearer of the news of his captivity. His gratitude to his deliverer never forſook him, and during all the ſteps of his elevation, he never intermitted a correſpondence of letters and of preſents with him. He even extended his beneficence to all the Frenchmen with whom he had any concern. In 1715, in the war between the Turks and the Venetians, the grand viſier, Ali-Baſhaw, intending to invade the Morea, aſſembled his army in the neighbourhood of the iſthmus of Corinth, and gave in charge to Oſman to force the paſſage, which he effected, and at the ſame time carried the city of Corinth by ſtorm. He acted as ſecond in command at the ſiege of Corfu, in the following year; and when it was raiſed, he remained three days after the general, to favour the retreat of the troops, not withdrawing till they were in ſafety. He was appointed Seraſkier, or chief commander in the Morea, in 1722, on which occaſion he requeſted Arniaud to ſend him one of his ſons, that he might give him a lucrative employment. He was next nominated to the government of Romelia, having obtained firſt the dignity of baſhaw of two tails, and now of three tails. In 1731 Oſman was called to the high dignity of grand viſier: he immediately cauſed Arniaud to be informed of this promotion, who, with his ſon, viſited Conſtantinople on the occaſion, bringing with him twelve Turkiſh captives, whom he ranſomed. The viſier received them in the preſence of the great officers of the empire, to whom he related the ſtory of his benefactor's generoſity to him. He treated them with the moſt affectionate familiarity, and gave them ſome ſubſtantial proofs of his kindneſs. His reign as viſier was of ſhort duration; he was depoſed in 1732, more to the regret of the people, to whom he had reſtored plenty, than to his own; and he felicitated himſelf that he left his place with a good conſcience, and without forfeiting the regard of his ſovereign. On his road to the government of Trebiſond, to which he had been appointed, he was ordered to take the command of the Turkiſh army in Perſia. In July 1733, he fought a bloody battle with Thomas Kouli-Khan, in which the Ottoman arms were victorious, and the Perſians were ſaid to have loſt 60,000 men. His ſucceſs was rewarded with an acceſſion of power and dignity. In a ſecond battle, which was extremely diſaſtrous to the Turks, Kouli-Khan took

took his revenge, and Oſman was killed by two muſket-ſhots. This was in the month of September, 1733. Moreri. Univer. Hiſt. Frazer's Life of Nadir-Shah, &c.; 1742.

Osman I., emperor of the Turks, was the ſon of Achmet I., and ſucceeded his uncle Muſtapha in 1618. He declared war againſt Poland in 1621, but after ſeveral defeats, he was obliged to conclude a diſadvantageous peace. Attributing his want of ſucceſs to the Janiſſaries, he reſolved to ſubſtitute a militia of Arabs in their room, which ſo provoked them, that they depoſed him, and placed Muſtapha on the throne, who cauſed Oſman to be ſtrangled in 1622. Oſman II. ſucceeded his brother Mahomet in 1754, and died in 1757.

Osman *Aga*, in *Geography*, a town of Walachia; 22 miles S.W. of Galacz.

OSMANDGIK, a town of Aſiatic Turkey, in the government of Sivas; 140 miles N.W. of Sivas. N. lat. 40° 45'. E. long. 35° 10'.

OSMANTHUS, in *Botany*, a name given by Loureiro to the *Olea fragrans*, alluding to its odoriferous flowers. See Olea.

OSMERI, in *Ichthyology*. See Salmo.

OSMI, in *Geography*, a town of Daghcſtan; 28 miles N.W. of Dcſbund.

OSMITES, in *Botany*, a Linnæan genus, whoſe name, derived from οσμη, *a ſmell*, or *ſavour*, is expreſſive of its very powerful odour. Linn. Gen. 441. Schreb. 575. Willd. Sp. Pl. v. 3. 2258. Mart. Mill. Dict. v. 3. Juſſ. 186. Lamarck Dict. v. 4. 647. Illuſtr. t. 704. Gærtn. t. 174. (Bellidiaſtrum; Vaill. Mem. Par. 1720.)—Claſs and order, *Syngeneſia Polygamia Fruſtranea*. Nat. Ord. *Compoſitæ Diſcoideæ*, Linn. *Corymbiferæ*, Juſſ.

Gen. Ch. *Common calyx* imbricated, gibbous; the inner ſcales elongated at the point. *Cor.* compound, radiated; *florets* of the diſk perfect, numerous, tubular, five-cleft; thoſe of the radius female, ligulate entire. *Stam.* (in the perfect florets) Filaments five, very ſhort; anthers cylindrical, tubular. *Piſt.* (in the perfect florets) Germen oblong; ſtyle thread-ſhaped, the length of the floret; ſtigma cloven: the female or ligulate florets differ in having a ſmaller germen and an obſolete ſtigma. *Peric.* none, except the unchanged calyx. *Seeds*, of the perfect florets, ſolitary, oblong, with ſcarcely any crown; or bordered, with an obſolete, ſomewhat chaffy one; in the female florets moſtly abortive or imperfect rudiments. *Recept.* chaffy.

Eſſ. Ch. Receptacle chaffy. Down obſolete. Florets of the radius ligulate. Calyx imbricated, ſcaly.

1. O. *Bellidiaſtrum*. Linn. Sp. Pl. 1285. (Anthemis fruticoſa; Amoen. Acad. v. 4. 330.)—Leaves linear, downy. Stems ſcarred.—Native of Ethiopia.—*Stem* ſhrubby, ſcarred by the fallen *leaves*, which are awl-ſhaped or linear, triangular, in tufts, at the ends of the branches, ſeſſile, downy all over. *Flowers* terminal, ſeſſile, ſeveral together at the ends of the ſtem and branches, their diſk yellow, and radius white.

2. O. *dentata*. Willd. n. 2. Thunb. Prodr. 163.—Leaves obovate, toothed, villoſe.—A native of the Cape of Good Hope, adopted on the authority of Thunberg. We are not acquainted with either a deſcription or figure of this ſpecies.

3. O. *camphorina*. Linn. Sp. Pl. 1285. Mant. 477. Gærtn. t. 174. (Bellis camphorifera africana aquatica, flore albo; Seb. Muſ. v. 1. 143. t. 90. f. 2.)—Leaves lanceolate, ſerrated from the baſe.—Found alſo at the Cape of Good Hope.—*Stems* quite ſimple, waved, furrowed, each bearing a ſingle head of flowers. *Leaves* alternate, ſeſſile, deeply ſerrated or toothed, naked, gradually ſmaller towards the top, much reſembling thoſe of *Chryſanthemum Leucanthemum*, the Ox-eye Daiſy.—*Flowers* capitate, terminal, with a yellow diſk and white radius.—The whole plant has a very ſtrong camphoric odour, whence its name.

4. O. *Aſteriſcoides*. Linn. Sp. Pl. 1285. (Leucanthemum fruticoſum camphoratum, foliis craſſis, anguſtis acutis; Burmann. Afric. 161. t. 58. f. 1.)—Leaves ovato-lanceolate, downy, dotted, obſoletely ſerrulated.—Native of the Cape.—*Stem* thick, branched, warty. *Leaves* alternate, thickly ſet, ſlightly embracing the ſtem. *Flowers* capitate, terminal, ſeſſile, yellowiſh-white.—The ſmell of camphor is not ſo ſtrong in this ſpecies as in the preceding.

5. O. *calycina*. Linn. Syſt. Veg. ed. 14. 783. Suppl. 380. (Lapeirouſia calycina; Willd. Sp. Pl. v. 3. 2260. Thunb. Prodr. 163.)—Leaves lanceolate, naked. Calyx remarkably ſcaly.—Like all the preceding ſpecies, a native of the Cape of Good Hope.—*Stem* ſhrubby, erect, proliferous, not thickened; branches a little downy. *Leaves* ſcattered, erect, narrow, lanceolate, naked or ſlightly downy, ſtriated, veined beneath. *Flowers* terminal, ſeſſile, yellow.

See Dr. Smith's reaſons for retaining this laſt ſpecies as an *Oſmites*, under the article Lapeirousia of this work.

OSMIUM, in *Chemiſtry*, a ſimple ſubſtance, and one of the metals. We have already ſtated, under the article Iridium, that when the black powder, which remains after diſſolving platina from the grains, as they come from South America, is alternately treated with an alkali and an acid, two ſolutions are obtained. The acid ſolution contains the iridium, while the alkali contains the metal called oſmium.

For the diſcovery of this metal we are indebted to Mr. Tennant. Fourcroy and Vauquelin had previouſly made ſome experiments upon the black powder above alluded to, but it ſeems they had confounded the two metals which it afforded.

The alkaline ſolution from the black powder contains the oxyd of oſmium, to which it gives a yellow colour.

In order to obtain the oxyd pure, the alkaline ſolution muſt be put into a retort. When ſulphuric acid is added, and heat applied, the oxyd comes over, diſſolved in water, to which it gives a ſtrong ſmell and a ſweetiſh taſte.

If the black powder be heated with nitre in a retort, at a temperature a little ſhort of redneſs, the oxyd of oſmium riſes and condenſes in the neck of the retort, in the form of oil. On cooling, it concretes into a ſemi-tranſparent maſs.

This ſubſtance is ſoluble in water, and poſſeſſes ſimilar properties to that obtained from the alkaline ſolution. It holds its oxygen with ſo little affinity, that if mercury be ſhaken with either the alkaline or the aqueous ſolution, the metal is ſet free, and forms an amalgam with the mercury. If the mercury be diſtilled from the alloy without contact with the air, the oſmium remains in a ſtate of purity. Oſmium is of a dark blue-grey colour, having metallic luſtre. This laſt property, together with its forming an alloy with mercury, ſufficiently prove its metallic nature.

When heated in the open air, it appears to evaporate. It is not, however, the pure metal which evaporates, but this occurs, in conſequence of its combining with the oxygen of the atmoſphere, ſince the metal is not volatile when the oxygen is excluded. When it is heated ever ſo ſtrongly in a cloſe crucible lined with charcoal, it does not fuſe.

The moſt remarkable property of this metal is its not being oxydated by any of the acids, although it eaſily combines with the oxygen of the atmoſphere, and with that ariſing from the decompoſition of nitric, above ſtated.

It is not leſs curious that it ſhould be oxydated and diſſolved

by potaſh. Although the oxyd of this metal is ſoluble in water, and its affinity for oxygen ſmall, it does not change vegetable blues, nor exhibit any other acid properties.

The ſolution of oxyd of oſmium, like that of gold and ſilver, ſtains the ſkin permanently.

An infuſion of galls changes it to a purple colour, which ultimately becomes blue.

If ether or alcohol be added to the aqueous ſolution, the oxyd is decompoſed, and the metal precipitated: a ſimilar effect would no doubt take place by paſſing hydrogen, or ſulphuretted hydrogen gaſes, through the ſolution.

This oxyd is decompoſed by all the metals excepting gold and platina. The other metals being immerſed in the ſolution of this oxyd, ſoon deprive it of its ſmell, while the oſmium is precipitated in the metallic form.

We are indebted to Mr. Tennant for theſe facts, which he made out at the time he diſcovered the metal. It is to be regretted that no new facts have been added, by which we might know the proportion of its combinations with other bodies.

OSMOND, in *Biography*, a ſaint, was born in Normandy, of a noble family. In 1066 he followed the fortunes of William, who became the conqueror of England, and who made him the chancellor of this kingdom, and nominated him to the biſhopric of Saliſbury. He reformed the liturgy for his dioceſe, which form afterwards became general throughout the kingdom, under the name of the Saliſbury liturgy. He died in 1099, and was canonized by Calixtus III.

Osmond *Royal*, or *Flowering Fern*, in *Botany*. See Osmunda.

Osmonds, in our *Old Writers*, a kind of iron anciently brought into England. It is mentioned in ſtat. 32 Hen. VIII. cap. 14.

OSMORZKOI, in *Geography*, a town of Ruſſia, in the government of Kolivan, on the Irtiſch; 201 miles W.S.W. of Kolivan. N. lat. 53° 15′. E. long. 76° 14′.

OSMUNDA, in *Botany*, a word of which no explanation has ever been given, and which Linnæus, in his *Philoſophia Botanica*, 160, mentions as one of thoſe which can hardly be traced to any language. In this he was miſtaken; for *Oſmund* is a Saxon proper name for a man, and expreſſes domeſtic peace. Its application to the plant is found to have originated in England. The elegant *Filix florida*, or Flowering Fern, which firſt received it, and which is an aquatic plant, ſhould ſeem, by Gerarde's herbal, a type or memorial of ſome "Oſmund, a water-man," whoſe hiſtory had not come down, even to that old writer, but whoſe heart, he ſays, was commemorated in the core of the root. Linn. Gen. 559. Schreb. 756. Mart. Mill. Dict. v. 3. Swartz Syn. Fil. 160. Ind. Occ. 1578. Sprengel. Crypt. 174. t. 5. f. 38. Tourn. t. 324. Juſſ. 15. Lamarck Illuſtr. t. 865. f. 2. Brown. Prodr. Nov. Holl. v. 1. 163. (Todea; Willd. in Mem. of the Acad. at Erfurt, for 1802. 14. t. 3. f. 1. Swartz Syn. Fil. 162.)—Claſs and order, *Cryptogamia Filices*. Nat. Ord. *Filices*. Linn. Juſſ.

Eſſ. Ch. Capſules ſtalked, nearly globoſe, ſemibivalve, burſting from the baſe up to a ſtriated dorſal protuberance, crowded on the back of the frond, or compoſing aggregate ſpikes on its contracted ſubdiviſions.

Obſ. From this the genus of *Botrychium*, conſiſting of the Linnæan *O. lunaria* and others which, like it, have bivalve capſules, without either ring or ſtriated protuberance, and growing on a proper ſtalk diſtinct from the leafy part of the frond, is now ſeparated. Their habits are unqueſtionably diſſimilar.

* *All the fronds fertile.*

1. O. *Claytoniana*. Virginian Oſmunda. Linn. Sp. Pl. 1521.—Frond pinnate, clothed when young with ruſty down; leaflets deeply pinnatifid; ſome of them, ſcarcely diminiſhed, covered with capſules.—Gathered by Clayton in Virginia. Sent, in 1772, by Samuel Martin M.D. to Kew garden, where it ſtill flouriſhes, bearing fruit in the latter part of ſummer. The *fronds* are upright, a yard high, narrow, compoſed of numerous, ſhort, moſtly alternate, deeply pinnatifid *leaflets*, ſmooth when fully grown. Many of theſe, about the middle of the frond, are either totally or partially covered with innumerable brown *capſules*, the edges of each ſegment turning in, ſo that nothing but capſules appear on either ſide of the leaf.—*O. interrupta* of Michaux Boreal-Amer. v. 2. 273, though adopted by Swartz on the credit of the French author, ſeems by his definition to be preciſely the *Claytoniana*.

2. O. *regalis*. Oſmund-royal, or Flowering fern. Linn. Sp. Pl. 1521. Sm. Fl. Brit. 1108. Engl. Bot. t. 209. Bolt. Fil. 6. t. 5. Fl. Dan. t. 217. (Filix florida, ſive Oſmunda regalis; Ger. em. 1131.)—Frond doubly pinnate; leaflets ſomewhat heart-ſhaped at their baſe; the upper ones contracted and covered with capſules. Native of Europe and North America, in marſhy ſhady places. An elegant fern, conſpicuous for its aſh-like *leaves*; and copious, compound, ruſty-coloured, cluſters of *capſules*, crowning the ſummit of the frond.

3. O. *barbara*. African Oſmunda. Thunb. Prodr. 171. Brown. Prodr. Nov. Holl. v. 1. 163, by accident, we preſume, printed *barbata*. (O. totta; Swartz in Schrad. Tourn. for 1801. 105. Acroſtichum barbarum; Linn. Sp. Pl. 1529. Filix africana, floridæ ſimilis, in ambitu foliorum argutè denticulata; Pluk. Phyt. t. 181. f. 5. Todea africana; Willd. Mem. Erf. for 1802. 14. t. 3. f. 1. Swartz Syn. Fil. 162.)—Frond doubly pinnate, coriaceous, ſmooth; leaflets decurrent, confluent, ſomewhat ſerrated; the lower ones unchanged, bearing capſules.—Native of the Cape of Good Hope, and of New South Wales. We obtained a fine living ſpecimen, in June 1806, from the ſtove of Mr. Evans, at Stepney. This fern is evidently a congener of the *Oſmundæ*, in our firſt diviſion more particularly. Its *frond* is handſome, two feet high, light green, ſmooth and ſhining, of a broad oblong figure, the *branches* and *leaflets* cloſe and regular; the latter elliptic-oblong, bluntiſh, ſometimes an inch in length, all decurrent into the winged ſtalk. Several of the *leaflets* neareſt the main ſtalk, about the middle of the frond, are covered at the back with crowded elliptical maſſes of *capſules* of a ruſty brown, unaccompanied by any pubeſcence.

* * *Fertile fronds ſeparate.*

4. O. *cinnamomea*. Woolly Oſmunda. Linn. Sp. Pl. 1522. (Filix non ramoſa, latiùs dentata mariana; Pluk. Mant. 78. Phyt. t. 400. f. 1.)—Fronds pinnate; leaflets deeply pinnatifid, with a woolly ſtalk; the fertile ones contracted and woolly.—Native of North America. It flouriſhes in Kew garden, having been received at the ſame time with the firſt ſpecies, from which it is known by its more woolly and cinnamon-coloured aſpect, and by ſome of the *fronds* being entirely fertile, the others barren. The ſegments of the *leaflets* too are ſhorter and broader; the cluſters of *capſules* hairy.

5. O. *japonicum*. Japan Oſmunda. Thunb. Japon. 330. Swartz n 5. (Dsjemmai, Phyllitis foliis ramoſis: Kæmf. Am. Exot. 891.)—Fronds doubly pinnate; leaflets lanceolate, ſerrated, heart-ſhaped at their baſe; the fertile ones triply pinnate.



—Found

—Found on hills in Japan, in April and May, by Thunberg, who deſcribes it as very like *O. regalis*, except the fertile *fronds* being ſeparate from the barren ones.—Swartz cites a figure of this in Houyttin's Nat. Hiſt. v. 2. t. 96. f. 1. which we have not ſeen.

O. *lancea*. Narrow-leaved Oſmunda. Thunb. Japon. 330. Swartz n. 6. Houytt. Nat. Hiſt. v. 2. t 95. f. 1. *Sw*—Fronds doubly pinnate; leaflets lanceolate, ſerrated; the fertile ones repeatedly compound, in a ternate manner.—Gathered by Thunberg in April and May in the Japaneſe iſland of Nipon. The firſt diviſions of the *frond* are nearly oppoſite, eſpecially the upper ones; *leaflets* alternate, rarely almoſt oppoſite, lanceolate, very finely ſerrated, tapering at each end, ſmooth an inch or inch and half long.

OSNABRUCK Township, in *Geography*, the fourth townſhip in the county of Stormont, in Upper Canada, in aſcending the river St. Lawrence. In front of this townſhip is the rapid called the Long Sault.

OSNABURG, or Osnabruck, *Biſhopric of*, a principality of Germany, bounded on the N. and W. by the biſhopric of Munſter, on the E. by the counties of Ravenſberg and Diepholz, and principality of Minden, and on the S. by the county of Ravenſberg; about 40 miles long, and from 16 to 24 wide. Almoſt a moiety of this biſhopric conſiſts of heath-lands, which yield turf and paſturage. The beſt ſpot is about Quackenbruck, and is called "Artland." It produces rye ſufficient for the inhabitants, and 500 ſtills. It imports from the principality of Minden, and the county of Schauenburg, conſiderable quantities of buck-wheat, ſmall wheat, oats, and barley. It has but a ſmall breed of cattle. It has little wood, but beſides turf, it yields coal. It has a ſalt-work at Diſſen; and plenty of marble. In the whole country are four principal towns, and three ſmaller, and about 20,000 fire-places, or hearths, uſually accommodating two families. The noble and free are not reckoned in this account. The land-ſtates are the chapter, the knights, and the principal towns. The land diets are appointed by the biſhop, and held in the town of Oſnabruck. The inhabitants are induſtrious, and of the peaſants, about 6000 go yearly to Holland, where they mow, till, cut turf, and do other work for hire. The religion of this country is partly Roman Catholic, and partly Lutheran. No Jews are tolerated. The principal and moſt profitable occupation of the inhabitants conſiſts of ſpinning of yarn, and of manufacturing a coarſe kind of linen for Guinea and America, from which they derive an influx of about 1.000.000 rix-dollars. This biſhopric is the firſt and oldeſt in Weſtphalia, having been founded by the emperor Charlemagne. At the peace of Oſnabruck, in 1648, it was ſettled that this biſhopric ſhould have alternately a Roman Catholic and a Lutheran biſhop; and that the latter ſhould be always ſelected out of the houſe of Brunſwick Luneburg, and from among the poſterity of duke George, and on the failure of theſe, out of the poſterity of duke Auguſtus. On the ſettling of the indemnities at Ratiſbon, in 1802, it was agreed that the biſhopric ſhould devolve on the electoral houſe of Brunſwick in perpetuity, on condition that the king of England, as elector of Hanover, ſhould reſign all pretenſions to Hildeſheim, Corvey, and Hexter, and abandon his rights in the cities of Hamburgh and Bremen, &c. By the peace of Tilſit, the new kingdom of Weſtphalia was eſtabliſhed, and Oſnaburg annexed to it.

Osnaburg, a city of Weſtphalia, in the biſhopric of the ſame name, ſeated on the Haſe, and fortified after the ancient manner. It conſiſts of the Old and New Town, under the government of a common magiſtracy. The number of houſes, excluſive of the public and bye-buildings, amounts to 1200; but the town is not populous. Its magiſtracy is Lutheran, and annually choſen. The Roman Catholics and the Lutherans have each two pariſh churches. Oſnabruck was formerly one of the Hanſe towns. Its principal ſubſiſtence depends upon its linen-trade, and the retail of foreign manufactures. This was the firſt town in Weſtphalia which received the Lutheran doctrine. George I. king of England died in this town in his way to Hanover; 24 miles N.N.E. of Munſter. N. lat. 52° 17'. E. long. 7° 4'.

Osnaburg *Iſland*, a ſmall iſland in the South Pacific ocean, ſuppoſed to have been firſt diſcovered by Quiros, in 1606, who called it "Dezana;" by Bougainville, it was called "Boudoir," and by Capt. Wallis, who diſcovered it in 1767, it was called Oſnaburg: by the natives it is denominated "Maitea." It is a high round iſland, not above a league in circuit; in ſome parts covered with trees, in others a naked rock. It has no anchoring-place. The inhabitants were clothed, and appeared to be of an humane diſpoſition; they were numerous and uſed canoes; ſome hogs were ſeen. Capt. Cook viſited this iſland in the year 1769, S. lat. 17° 48'. W. long. 148° 10'.—Alſo, an iſland in the South Pacific ocean, diſcovered by Capt. Carteret in the year 1767. It is a ſmall, low, flat iſland, appearing almoſt level with the water's edge, and covered with green trees. S. lat. 22°. W. long. 141° 34'.

Osnaburg *Houſe*, a ſettlement of the Hudſon's Bay company in North America, ſituated at the N.E. corner of lake St. Joſeph, 100 miles W. by S. of Glouceſter houſe. N. lat. 51°. W. long. 90° 15'.

OSNABURGHS, a kind of coarſe linen imported from Germany: of which there are two kinds; the one white, and the other brown. The manufacture of the white is well underſtood in our own country; but the method practiſed in Germany of manufacturing the brown ſort, and of giving it its peculiar colour, is not known. Some have ſuppoſed, that it depends on the manner of bleaching the flax, and others on that of bleaching the yarn after it is ſpun.

OSOKOLSKA, in *Geography*, a town of Ruſſia, in the government of Archangel, on the river Mezen; 104 miles E.N.E. of Archangel.

OSOLA, a town of the iſland of Sardinia; 14 miles N.N.E. of Saſſuri.

OSONALA, a town of Naples, in Abruzzo Ultra; 10 miles E.S.E. of Aquila.

OSORIO, Jerome, in *Biography*, a learned Portugueſe prelate, who flouriſhed in the ſixteenth century, was born at Liſbon in the year 1506. From his earlieſt childhood he diſcovered a ſtrong inclination for acquiring learning, and aſtoniſhed his maſters by the rapidity with which he became ſuch a proficient in the Latin language as to be able to converſe in it. At the age of thirteen he was ſent to the univerſity of Salamanca, where he perfected himſelf in Latin and Greek, and afterwards, by the command of his parents, applied for ſome time to the ſtudy of the civil law. When he was nineteen years old he removed to Paris, where he ſtudied under the moſt celebrated profeſſors in that city. Here he became intimately acquainted with Peter le Faire, one of the firſt aſſociates of Loyola, a circumſtance that contributed to the early introduction of the Jeſuits into Portugal, by inducing him warmly to recommend the patronage of the ſociety to king John III. Oſorio went from Paris to Bologna, where he devoted himſelf entirely to the ſtudy of divinity, the ſcriptures, and the Hebrew language. After his return to his native country, he was appointed by the king profeſſor of ſacred literature at the univerſity of Coimbra, where he gave lectures on the epiſtle of St. Paul to the Romans, and alſo on the prophecy of Iſaiah. He was now ordained prieſt, and was appointed to the benefice of Tavara.

He received other inſtances of church preferment, and was at length promoted to the biſhopric of Sylves by Catherine of Auſtria, the duties of which high office he performed with the utmoſt regularity and benevolence. When king Sebaſtian arrived at his majority, he determined to attempt the conqueſt of Africa, againſt which Oſorio earneſtly admoniſhed and humbly entreated the king, foreſeeing and predicting the diſaſtrous conſequences that would neceſſarily reſult from it. When he found his remonſtrances unavailing, he went under various pretences to Rome, that he might not be a witneſs to the calamities which he was ſenſible were impending over his country. He was favourably and reſpectfully received by pope Gregory XIII. Sebaſtian, though he would not follow the advice of his prelate, could not bear that he ſhould be abſent from his country, and recalled him to Portugal within twelve months of his departure. He returned, and almoſt immediately received the fatal intelligence of the deſtruction of his ſovereign and his army in the battle of Alcazar againſt the Moors. (See SEBASTIAN.) We cannot enter into the miſeries in which the conſequences of that battle involved Portugal, particularly after the death of king Henry. On this laſt event, Oſorio, always the friend of peace, adviſed ſubmiſſion to the claims of Philip II., king of Spain, to the crown, and he laboured to preſerve the people of his dioceſe from taking a part in the tumults which diſtracted and laid waſte the kingdom. Theſe diſorders he took ſo much to heart, that it is ſaid he died with grief in the year 1580. He is highly ſpoken of by Dupin, who ſays "he wrote with eaſe and eloquence. He is entitled to the denomination of the *Portugueſe Cicero*, ſince no writer has more cloſely imitated that Roman, whether we regard his ſtyle, his choice of ſubjects, or his manner of treating them." His works are numerous, partly political and partly theological. The latter chiefly conſiſted of paraphraſes on Job, the books of Pſalms, the book of Wiſdom, and Iſaiah; and Commentaries upon ſeveral of the books of the Old Teſtament. His object in his paraphraſes and commentaries, is not ſo much to explain the terms of the text as to extend the ſenſe of it, and to ſhew its order and ſeries. Theſe works, with twenty-one ſermons, were collected together, and publiſhed at Rome in 1592, in four volumes, by his nephew Jerome, canon of Evora, who alſo wrote a life of his uncle, which he prefixed to the collection of his works; "Notationes in Hieronymi Oſorii Paraphraſim Pſalmorum," printed in the third volume of the above-named collection. The work, ſays Mr. Southey, in the General Biography, by which the biſhop of Sylves is beſt known, in his hiſtory "De Rebus Emmanuelis, Luſitaniæ Regis," of which a new edition appeared in 1791 at Coimbra, in three volumes 12mo. Of this work, which is beautifully printed, there is a French tranſlation and an Engliſh one. The kings of Portugal, as their hiſtory was more ſplendid than that of all others, ſeem to have been of all ſovereigns moſt deſirous that it ſhould be extenſively known. Purſuant to their deſire, two hiſtories in Latin of the diſcovery of India, and the conqueſts there, appeared about the ſame time, one by the Jeſuit Maffæus, and the other, this work, by Oſorio. The library of Oſorio was carried off to England by the Engliſh fleet, on their return from Cadiz, in 1596. The Bodleian library was opened the enſuing year, and lord Eſſex gave ſir Thomas Bodley a conſiderable part of this collection. Moreri. Gen. Biog.

OSORRO, in *Geography*, a town of Chili, in a diſtrict abounding with gold mines, 40 miles S.E. of Valdivia. S. lat. 40°. W. long. 73° 40′.

OSOSOR, a word uſed by ſome authors as a name for opium.

OSPEDALETTO, one of the four renowned conſervatorios at Venice, of which Sacchini was the maſter in 1770. The females educated there were all orphan girls; one of them, La Ferrareſe, had a voice of uncommon compaſs at that time, as ſhe was able to reach the higheſt E in our keyed-inſtruments, upon which ſhe could dwell a conſiderable time, in a fair natural voice. But beſides this natural power, ſhe had been well taught, and was, in every reſpect, a very capital ſinger. We heard at this conſervatorio a Latin oratorio, "Macchabæorum Mater," compoſed by Sacchini, in an exquiſitely graceful and pathetic ſtyle. In the performance of this ſacred drama, the Ferrareſe gratified us ſtill more in delivering an admirable accompanied recitative with ſuch energy and feeling as are ſeldom heard.

OSPREY, in *Ornithology*. See FALCO *Oſſifragus*.

OSRHOENE, in *Ancient Geography*, a ſmall ſtate of Aſia, which occupied the northern and moſt fertile part of Meſopotamia, between the Euphrates and the Tigris. Under the Seleucidæ, a part of this country took the name of Mygdonia, with the title of kingdom. Polybius ſpeaks of this kingdom in connection with Antiochus the Great. The capital of this kingdom was *Edeſſa*; which ſee. The feeble ſovereigns of Oſrhoene, placed on the dangerous verge of two contending empires, were attached from inclination to the Parthian cauſe; but the ſuperior power of Rome exacted from them a reluctant homage, which is ſtill atteſted by their medals. After the concluſion of the Parthian war under Marcus, it was judged prudent to ſecure ſome ſubſtantial pledges of their doubtful fidelity. Forts were conſtructed in ſeveral parts of the country, and a Roman garriſon was fixed in the ſtrong town of Niſibis. During the troubles that followed the death of Commodus, the princes of Oſrhoene attempted to ſhake off the yoke; but the ſtern policy of Severus confirmed their dependence, and the perfidy of Caracalla completed the eaſy conqueſt. Abgarus, the laſt king of Edeſſa, (A.D. 216.) was ſent in chains to Rome, his dominions reduced into a province, and his capital dignified with the rank of colony; and thus the Romans, about ten years before the fall of the Parthian monarchy, obtained a firm and permanent eſtabliſhment beyond the Euphrates.

OSRUSHNAH, in *Geography*, a town of Turkeſtan, and capital of a diſtrict, to which it gives name; 65 miles N.N.E. of Samarcand. N. lat. 40° 30′. E. long. 64° 30′.

OSSA, in *Anatomy*, a technical term employed in ſpeaking of the bones, particularly of the head, as oſſa naſi, oſſa ſpongioſa, &c. See BONE and OS.

OSSA, in *Geography*, a river of Pruſſia, which runs into the Viſtula, 15 miles below Culm.

OSSABAW, an iſland in the Atlantic, near the coaſt of Georgia, 20 miles in circumference. N. lat. 31° 42′. W. long. 81° 17′. Between this iſland and Great Waſſaw is a channel, called Oſſabaw ſound. N. lat. 31° 43′. W. long. 81° 12′.

OSSÆI, or OSSENI, a name ſometimes given to the Jewiſh ſect of religion called Eſſenians.

OSSARA, in *Geography*, a town of Hindooſtan in Mohurbunge; 18 miles N. of Harriopour.

OSSAT, ARNAUD D', *Cardinal*, in *Biography*, was born in 1536, of parents in humble life, at a village near Auch: he was left an orphan at an early age, and roſe in the world wholly by his own merit and induſtry. Entering into the ſervice of a young nobleman of the houſe of Marca, he ſtudied with him, and in time became his preceptor. In 1559 he took his pupil, with two other young perſons, to Paris, where he carefully ſuperintended their education, at the ſame time taking care not to neglect his own ſtudies. In philoſophy he was a diſciple of Ramus, and compoſed a

work in his maſter's defence. After he had made what he deemed ſufficient progreſs in his legal ſtudies, he practiſed at the bar in Paris, and was greatly admired for his maſculine eloquence. He obtained the poſt of a counſellor in the preſidial court of Melun: after this he went with Paul de Foix, archbiſhop of Toulouſe, who had been nominated by Henry III. ambaſſador, to the court of Rome, as his ſecretary. After the death of that prelate, in 1584, Oſſat took holy orders, and was received into the houſe of cardinal d'Eſte. The ſecretary of ſtate, Villeroi, made him Chargè des affaires for the French court; and in this quality, at the beginning of Henry IVth's reign, he was highly ſerviceable in promoting the reconciliation of that king with the ſee of Rome. In 1598 he was honoured with a cardinal's hat, and in three years afterwards was made biſhop of Bayeux. He died in 1604. He was a man of great penetration, and ſingularly prudent and circumſpect in the management of affairs, ſo that it is ſaid of him, that he never made a falſe ſtep. He left behind him a great number of letters relative to the negociations in which he was engaged, which are reckoned models of political ſagacity. The beſt edition is that of Amelot de la Houſſaye, in 1698, in two vols. 4to., and five vols. 12mo. Moreri.

OSSEGG, in *Geography*, a town of Bohemia, in the circle of Leitmeritz; 18 miles W.N.W. of Leitmeritz.

OSSELET, in the *Manege*, is a very hard excreſcence, reſembling a little bone, on the inſide of the knee (and never on the outſide), appearing to be of the ſame ſubſtance with the reſt of the knee, and only diſtinguiſhable from the knee by its extending a little lower

OSSENIGA, in *Geography*, a town of Italy, in the Veroneſe; 6 miles N. of Verona.

OSSERVANZA, Ital., in *Muſic: con oſſervanza*, with care, attention, exactitude, in obſerving and executing with preciſion whatever is written or printed; without omiſſions or addition, which Corelli expreſſes by *come ſta*, as it ſtands in the copy.

OSSIACH, in *Geography*, a town of Carinthia, on the lake Oſſiacher; 4 miles S.W. of Feltkirchen.

OSSIACHER See, a lake of Carinthia, four miles long and two wide; 4 miles N.E. of Villach.

OSSIAN, in *Literary Hiſtory*, a Celtic bard, who, as well as Fingal and other heroes whom he is ſaid to have celebrated in his poems, is claimed both by the Highlanders of Scotland and the Iriſh. It is highly probable, that the name of Oſſian and his heroes would have been confined to theſe people, had not Macpherſon, about the middle of the laſt century, publiſhed two volumes of poems, as the genuine offspring of this Celtic bard. The circumſtances which he ſtated, as having attended the diſcovery of theſe poems, and the nature and deſcription of the poems themſelves, excited ſtrong ſuſpicions of their authenticity, almoſt as ſoon as they were given to the world: the controverſy to which theſe ſuſpicions gave birth, contributed to render them known and popular; however, it would be unfair to deny, that their intrinſic merits, though certainly very much miſrepreſented and overrated, alſo obtained them popular applauſe and favour. There were alſo other circumſtances, beſides the ſingular and ſuſpicious nature of their diſcovery and publication, and the poetic merits which they poſſeſſed, or were ſuppoſed to poſſeſs, which fixed on them the curioſity and intereſt of men of philoſophy and literature. They exhibited a moſt uncommon and unparalleled picture of human manners; a picture, which, if it were drawn from nature, would confound all the principles which philoſophy had deduced from the hiſtory of mankind: they alſo related events, not eaſily reconcileable to the authenticated hiſtory of the country, where the ſcene was laid: on theſe accounts, the intereſt of almoſt all claſſes was fixed upon them; they were admired by the lovers of poetry, who, in their admiration, had not time or inclination to inveſtigate their authenticity; while by thoſe who viewed them more coolly and philoſophically, and who could not permit themſelves to admire, before they were convinced of their authenticity, ſtrong and various objections were urged againſt their claim to be conſidered as the poems of Oſſian. The intereſt which they excited was ſtill farther increaſed, by the Highlanders taking up the queſtion, both reſpecting their authenticity and their poetical merits, as one in which their honour and pride were immediately and deeply concerned: they could not tamely or quietly abandon the belief that Oſſian wrote theſe poems; and when Macpherſon was charged with having forged them, the firm conviction they had expreſſed of their authenticity, joined to the diſgrace which, through Macpherſon, they thought would fall on themſelves, rendered them moſt obſtinate in their original belief.

In this article it is propoſed to examine whether Oſſian and his heroes were Scotch or Iriſh; to fix, as nearly as poſſible, the period during which they flouriſhed; to ſtate the notices of his poems, which are ſcattered in ancient authors; to give an account of the ſearch after them, which was made before the time of Macpherſon; to relate the circumſtances attending the publication of Oſſian's poems by Macpherſon; to point out the principal and moſt ſtriking characteriſtics of theſe poems; and to conclude with an abſtract of the controverſy reſpecting their authenticity.

Although the claims of the Highlanders to Oſſian and his heroes have been more urgent and repeated than thoſe of the Iriſh, there is good reaſon for believing that the latter poſſeſs the greateſt juſtice. There are numberleſs traditions in Ireland concerning the Fions, a ſpecies of militia, inhabiting Leinſter, and commanded by Fin Mac Coul: that this Fin Mac Coul is the ſame as the Fingal of Macpherſon is clear, from the identic name of the father, Cuwal, the ſon Oiſin, and the grandſon Oſkir; and from the old Scotch poets, who ſometimes call him Fingal, and ſometimes Fin Mac Coul. Among the warriors of this ancient militia, the Iriſh traditions and hiſtories hand down the names of Goll Mac Morn (Gaul the ſon of Morni) of Oſgur the ſon of Oiſin, evidently the Oſſian of Macpherſon, of Fergus O'Fillan, and other warriors. Oſſian himſelf, alſo, is celebrated among the Fions. Beſides theſe heroes, Iriſh traditions and ancient manuſcripts mention a military order in Ulſter of earlier date, the chief ornament and ſupport of whom was Cuchullin. This evidence undoubtedly aſcribes Oſſian and his heroes to Ireland; but it is farther corroborated, even by the traditions and old ſongs and poems of the Highlands, though the paſſages in the latter, which deſcribe Ireland as the native country of Oſſian, Fingal, &c. have been altered for controverſial purpoſes: it is needleſs to cite all theſe paſſages: the following, from Erſe poems, collected in the Highlands by Dr. Young, biſhop of Clonmore, and publiſhed in the firſt volume of the Iriſh Tranſactions, may ſuffice.

In the combat of Con, the ſon of Dargo, and Gaul ſon of Morne, the Fions are called "the noble Fions of Ireland:" this, in the Perth edition of this poem, is changed into "the nobles and great chieftains." In the combat of Oſgar, and Illan ſon of the king of Spain, for "the Fions of Ireland," the Perth edition ſubſtitutes the "noble Fions." In a poem called the Death of Oſcar, of which Macpherſon made uſe in the firſt book of Temora, Ireland is expreſsly mentioned as the country of that prince: "The death of Oſcar grieved my heart, our loſs is great in the prince

prince of the chiefs of Ireland:" and in another poem on this fubject, ſtill current in the Highlands, Oſcar is called the "prince of Ireland; the prince of the heroes of fertile Ireland." Even ſo late as the time of Gawin Douglas, Ireland ſeems to have been regarded as the country of Fingal and the other heroes of Oſſian.

"Great Gow Mac Morn, and Fin Mac Coul, and how
They ſhould be gods in Ireland, as men ſay."

There is another circumſtance, which conſiderably ſtrengthens the opinion that the Fions were natives of Ireland. No Highlander ever heard of Selma, except through the poems publiſhed by Macpherſon; whereas, Almhuin is pointed out by every old Iriſhman as the abode of Fingal: the name of this place occurs frequently in the poems which were collected in the Highlands by Dr. Young; it is always mentioned as the palace of Fingal; neither Selma, nor any other place of reſidence, is given in theſe poems to this hero; and it is worthy of remark, that Macpherſon, in the uſe he has made of theſe poems, has either omitted altogether the name of Almhuin, in order that no trace of Fingal's real country might exiſt, or changed it into Albin, in order to countenance the idea, that he was a native of Scotland; as will appear from the following paſſages; "Greater love ſeized all the heroes of Fin of Almhuin." On this paſſage Dr. Young remarks: "The palace of Fin Mac Cumhal in Leinſter, was ſeated on the ſummit of the hill of Allen, or, rather, as the natives of that country pronounce it, Allowin; the village and bog of Allen have thence derived their name. There are ſtill the remains of ſome trenches on the top of the hill, where Fin Mac Cumhal and his Fions were wont to celebrate their feaſts. The country hereabouts abounds in wonderful tales of the exploits of theſe ancient heroes. Theſe two lines are omitted in the Perth edition." Iriſh Tranſactions, i. 76.

In the Dublin copy of the poem on the invaſion of Ireland by Erragon, which Macpherſon appears to have made uſe of in his battle of Lora, theſe words occur: "To Almhuin in Leinſter reſidence of the Fions, they took their voyage acroſs the ſea:" in this place, Macpherſon has ſubſtituted the word Albin, though, as Dr. Young remarks, there can be no excuſe for this alteration, "as the king of Lochlin is repreſented ſteering his fleet boldly to the coaſts of Ireland, and challenging the heroes of Innisfail. The infidelity, therefore, of the queen of Lochlin could not be ſaid to have been the cauſe of ſpilling Scottiſh blood, ſince the ſcene of the whole tranſaction is laid in Ireland, and they are the heroes of Innisfail who fell in battle."

As, therefore, the Iriſh traditions reſpecting the Fions are uniform and conſiſtent; as, even in the poems which celebrate their exploits, and which are current and popular in the Highlands, many paſſages occur, in which Ireland is expreſsly mentioned as their native country; and as, beſides, the palace of Fingal is a place not known in the Highlands, but ſtill pointed out, at leaſt by ſimilarity of name, in Ireland, we are juſtified in concluding that Oſſian and his heroes were natives of Ireland. This concluſion will be ſtill farther ſtrengthened if we examine the vague and inconſiſtent notices, which Scotch tradition and hiſtory records of Oſſian and his heroes. Indeed, in Scottiſh hiſtory they were never heard of till Bruce claimed them as of Scotch extraction; for in the paſſages quoted by the Highland Society (in their Report on the Poems of Oſſian), Fingal, and the other heroes of that bard, are mentioned, without any reference to the country of which they were natives. The Highland Society lay great ſtreſs on the proverbs which are current in the Highlands reſpecting Oſſian, and the names of places corresponding with the names of his heroes: *Oſſian dale*, blind Oſſian, is a perſon as well known there as ſtrong Sampſon, or wiſe Solomon: the very boys, in their ſports, cry out for fair play, "the equal combat of the Fingalians:" and "Oſſian, the laſt of his race," is proverbial to ſignify a man who has had the misfortune to ſurvive his kindred. In anſwer to the queries, which were tranſmitted by the Highland Society, ſeveral of their correſpondents mentioned the names of various places in their neighbourhood, tending to ſhew the univerſal ancient traditionary belief of the exiſtence of Fingal and his heroes. "Among many others were enumerated the well known cave of Staffa, firſt made known by the deſcription of ſir Joſeph Banks; the whirlpool, or gulf ſet down in Blair's Atlas Scotiæ, publiſhed A.D. 1662, called Coire Fin Mac Coul, or the Whirlpool of Fion, ſon of Comhal; and the hill in the iſle of Sky, known by the name of Ait Suidh Fhinn, or Fingal's ſeat. Indeed there are few diſtricts in the north-weſt of Scotland, where ſuch inſtances may not be found." Report on the Poems of Oſſian, p. 79.

But all theſe circumſtances, even when collected and taken together, do not amount to a proof that Oſſian and his heroes were natives of the Highlands of Scotland: they merely prove the antiquity of the tradition and belief reſpecting them. In Ireland, on the other hand, there are not only ſimilar proverbial and local notices (if the expreſſion may be allowed) of Oſſian and his heroes; but there is hiſtorical evidence that the Fions were Iriſh, and the palace of their chief is ſtill recogniſed and pointed out. None of the traditions, or genuine poems, preſerved in the Highlands, which have reference to them, name or claim them as natives of that country: whereas, in ſeveral paſſages of the latter, they are clearly and expreſsly declared to have been natives of Ireland, and to have reſided there, and there to have carried on their military exploits. But it may be aſked, how happens it, if Oſſian and his heroes were Iriſh, that the tradition of them is ſo ſtrong and prevalent in the Highlands, the proverbial expreſſions relating to them ſo marked and numerous, and the places named after them ſo common: the ſolution of this difficulty is very eaſy: it is well known, that at the period when the Fions lived, the intercourſe between that part of Ireland, where they are ſaid to have reſided, and the Highlands of Scotland, was frequent; and it is alſo highly probable, as will afterwards be ſhewn, that an Iriſh colony, nearly at, or immediately ſubſequent to this period, paſſed over to that part of the Highlands, where the traditions and notices of Oſſian are moſt commonly met with.

It is not very eaſy, accurately and ſatisfactorily to fix the period when Fingal and Oſſian flouriſhed: the era which Macpherſon aſſigns them muſt be given up. Later Iriſh MSS., traditions and poems, both in Ireland and the Highlands, repreſent Oſſian as contemporary with St. Patrick; but if we may depend on the account of the Iriſh miſſias of Ulſter and Leinſter, Fingal muſt have ſucceeded St. Patrick nearly two centuries; and, conſequently, his ſon Oſſian could not have been contemporary with him. According to the Iriſh annals (on the authenticity of which, however, much ſtreſs ought not to be laid), Fingal flouriſhed under Cormac O'Cuin, about the year 254. That Oſſian was not contemporary with St. Patrick, is, however, moſt ſatisfactorily proved from Jocelin, a writer of the 12th century, in his life of that ſaint, who places Fin Mac Coul above a hundred years before him. Oſſian and his heroes may, therefore, be placed about the end of the third and the beginning of the fourth century; and it may be inferred, that all poems which refer them to a later period, are not

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the genuine poems of Offian. It will be proper to keep this remark in our recollection when we come to difcufs the authenticity of the poems which have been afcribed to this bard.

There are fcarcely any notices refpecting thefe poems to be found in old authors, who treat either of Ireland or of Scotland: the bards or feanachies of the latter country do not trace up their kings to the Fions, or heroes of Fingal, but to the Dalriadic monarchs. At the coronation of Alexander III. a Highland genealogift is introduced by Fordun to recite the royal pedigree, but inftead of afcending from Fergus Mac Erth, to Erth Congal, Fergus, Fingal, and from thence, according to Offian, to Comhal, Trahal, and Trenmor, he proceeds through the whole race to Fergus I., a fufficient proof, that there was no tradition then of the fix kings of Morven, nor any poems, which treated of the exploits of Fingal and his heroes. Had thefe poems exifted in the time of Monro, dean of the Ifles, he would have appealed to them in his genealogy of the clans. Buchanan indeed, in his account of the family of Buchanan, mentions the Militia of Fin, and fpeaks of "rude rimes," on the actions of Fin Mac Coul, as retained by the Iriſh and Scottiſh Highlanders. There is, however, a paffage in bifhop Carfwell's introduction to his tranflation of the Forms of Prayer, into Gaelic, printed at Edinburgh in the year 1567, which is quoted in the report of the Highland Society, in order to give an idea of the general impreffion and delight, which the recital of the poems or ballads (of Offian) produced among the inhabitants of the Highlands, which it may be proper to confider: in this paffage the bifhop complains, that "great is the blindnefs and finful darknefs, and ignorance, and evil defign of fuch as teach, and write, and cultivate the Gaelic language, that with a view of obtaining for themfelves the vain reward of this world, they are more defirous and more accuftomed to compofe vain, tempting, lying, worldly hiftories, concerning the *Tuatha de dannan*, and concerning warriors and champions, and Fingal the fon of Cumhall, with his heroes, and concerning many others, which I will not at prefent enumerate or mention, in order to maintain or reprove, than to write, and teach, and maintain the faithful word of God, and of the perfect way of truth." Now this paffage, cited by the Highland Society, in order to prove the currency and popularity of Offian's poems, actually proves, that the bards were accuftomed, in the time of bifhop Carfwell, to compofe poems concerning Fingal, which poems were probably in fubfequent ages confidered as the genuine poems of Offian.

The firft perfon who feems to have conceived the idea of collecting the poems and ballads of the Highlands, was a young man, Jerome Stone of Dunkeld, who had acquired a knowledge of the Gaelic language. Of one of the poems, which he collected, he publifhed a tranflation in rhyme, in the Scotch Magazine for January 1756. Nearly about the fame time Mr. Pope, minifter of Reay in Caithnefs, entertained the defign of making a collection of the ancient poetry of the Highlands; but in confequence of the death of the gentleman who engaged with him in this undertaking, he feems to have dropped it very foon.

The next collector of Gaelic poetry was Mr. James Macpherfon. In the year 1759, Mr. Home, the author of Douglas, met him at Moffat; in the courfe of a converfation on the manners of the Highlands, Macpherfon informed him that one of their favourite amufements "was to liften to the tales and compofitions of their ancient bards, which he defcribed as containing much pathos, and poetical imagery, and at Mr. Home's defire, he tranflated fome fragments, which his memory ferved him to recollect. The beauty of thefe fragments ftruck Mr. Home, and his friends at Moffat, to whom he communicated them, fo forcibly, that they prevailed on Mr. Macpherfon, who was rather averfe to the undertaking, to publifh them in a fmall volume at Edinburgh, of which they agreed to fuperintend the publication, and defray the expence." Report of the Highland Society on the Poems of Offian, p. 27.

This fmall volume contained the opening, and fome epifodes of Fingal; and an intimation was given, that if it were favourably received, the whole of Fingal might be recovered. A fubfcription was accordingly fet on foot, to enable Macpherfon to perform a tour through the Highlands to collect larger and more complete fpecimens of Gaelic poetry. When he returned to Edinburgh, he communicated to his literary patrons the refult of his expedition; and foon afterwards, Fingal, an epic poem in fix books, was publifhed, along with fome fmall detached pieces. In the year 1765, he publifhed another epic poem, entitled "Temora." To one of the books of this poem, he annexed what he called the original Gaelic: but of the reft he only publifhed the tranflations. At his death, however, he left 1000*l.* to defray the expence of the publication of the originals of the whole; on which publication we fhall afterwards offer fome remarks.

The fuccefs which had attended Mr. Macpherfon's refearches, and the fame which he had acquired by the publication of the poems of Offian, incited feveral others to proceed into the Highlands, and to collect from tradition or manufcripts Gaelic ballads; while, as a fufpicion of the authenticity of what Macpherfon had publifhed arofe in the minds of many, enquiries were alfo fet on foot, for the purpofe, if poffible, of detecting the fuppofed impofture. There is reafon to believe, too, that fome of the poems, which were given to the world, after the fuccefs and fame of Macpherfon, were not genuine Gaelic poems, nor even founded on the traditionary ballads of the Highlands, but entirely the fabrication of thofe who publifhed them.

In the year 1780, Mr. John Clark, land furveyor in Badenoch, publifhed tranflations of Gaelic poetry; the principal of thefe was a regular poem, in three books; two of which were afterwards publifhed in a verfe tranflation by Mrs. Grant of Laggan. In the fame year, Mr. Hill, in a tour through the Highlands, collected, chiefly from one Macnab, a blackfmith in Argyleſhire, copies of feveral ancient poems: which from the incidents which they contain, and other internal evidence, muft be deemed of a later date, than that which Macpherfon is difpofed to attribute to the poems which he publifhed. Along with tranflations of thefe poems Mr. Hill gave the Gaelic original; and to the whole he fubjoined remarks, on the authenticity of Macpherfon's Offian, which at that time had become the fubject of keen controverfy.

In the year 1786, a pretty large collection of Gaelic poetry of various dates was publifhed at Perth: this volume contained feveral fhort ballads, fimilar in their fubject to fome of the poems publifhed by Macpherfon.

But the moft voluminous collector of Gaelic poetry, fince the time of Macpherfon, was Dr. Smith, minifter of Campletown in Argyleſhire. In the year 1780, he publifhed Differtations on Gaelic antiquities, to which he annexed a collection of ancient poems, tranflated from the Gaelic of Offian, Ullin, Oran, and others; and afterwards, in 1787, he publifhed the originals. To his publication he fubjoined an account of the manner in which he procured thefe originals.

In the year 1784, Dr. Young, afterwards bifhop of Clonmore, made an excurfion through the Scottiſh Highlands,

lands, for the purpoſe of collecting all the information in his power concerning the authenticity of Macpherſon's Oſſian. The reſult of his enquiries and inveſtigation he gave to the world in the firſt volume of the Tranſactions of the Royal Iriſh Academy. It conſiſted of ſome rude ancient Gaelic poems reſpecting the race of the Fions, which we have already had occaſion to notice and quote. Theſe poems Dr. Young tranſcribed letter for letter from the copies current in the Highlands, except ſo far as they were corrected by the edition publiſhed at Perth. Dr. Young does not mention the apparent antiquity of the MSS. from which he tranſcribed theſe ballads.

Theſe are the principal collections of Gaelic poetry which have been publiſhed, as preſerved by tradition or in manuſcripts, in the Highlands of Scotland. In Ireland a collection made its appearance ſoon after Macpherſon's Oſſian: this conſiſted of a tranſlation in rhyme, by Miſs Brooke, of ſome Iriſh ballads, which ſhe ſuppoſes to be of a later date than that in which Oſſian flouriſhed, and probably of the eighth, ninth, and tenth centuries. Moſt of theſe Iriſh poems relate to the Fingalians; but they differ both in the incidents which they relate, and in their manner and ſtyle, from the poems under ſimilar titles, which have been collected in the Highlands of Scotland. One moſt ſtriking difference conſiſts in the magical machinery of the Iriſh poems, inſtead of the mere reference to the belief of the employment and intervention of departed ſpirits, which the Fingalian poetry of the Highlands exhibits.

As the reſult of the reſearches of the Highland Society, which was given to the world in their report into the nature and authenticity of the poems of Oſſian, will fall more properly under our notice, when we come to diſcuſs that authenticity, we ſhall proceed to point out the moſt ſtriking characteriſtics of theſe poems.

On the firſt peruſal of theſe poems, the reader is ſtruck with their obſcurity; he finds it neceſſary to pauſe and reflect, before he can aſcertain the meaning of many paſſages, or perceive and trace the connection of the narrative. Even after he has become accuſtomed to the ſtyle, he is obliged to leave in deſpair many parts as abſolutely unintelligible, or at leaſt as conveying no clear and diſtinct idea or image to his mind; beſides this great fault, the poems labour under the imputation of being exceſſively bombaſtic and turgid; ſo that a reader of taſte and judgment has ſeveral difficulties to overcome, before he can ſit down to their peruſal, in ſuch a ſtate of mind and feeling, as will permit and enable him calmly and impartially to appreciate their merits. And even after he has got over the repugnance excited by their obſcurity and bombaſtic ſtyle, he will be in danger of being repelled and diſguſted by their ſentimental effuſions, which, in many inſtances, are of the moſt romantic and fickly character. Still, however, there is ſomething in the poems which gets the better of all theſe objections; and which is more powerful in its attractions, than the faults which we have noticed are in their repulſive quality. The great characteriſtics of Oſſian's poetry, are undoubtedly, as Dr. Blair remarks, tenderneſs and ſublimity; but the tenderneſs is pathetic, melancholy, and ſolemn; and the ſublimity is dreary, deſolate, and gloomy There is nothing gay or chearful; the mind of the reader is prepared for the grave and ſolemn events which they record, by the wild and romantic ſcenery which they deſcribe. "The extended heath by the ſea-ſhore; the mountain ſhaded with miſt; the torrent ruſhing through a ſolitary valley; the ſcattered oaks and the tombs of warriors overgrown with moſs;—all produce a ſolemn attention in the mind, and prepare it for great and extraordinary events."

The following paſſages may be cited as inſtances of the ſublime.

"As autumn's dark ſtorms pour from two echoing hills, ſo toward each other approached the heroes. As two dark ſtreams from high rocks meet and mix, and war on the plain: loud, rough, and dark in battle, met Lochlin and Innisfail: chief mixed his ſtrokes with chief, and man with man. Steel clanging, ſounded on ſteel. Helmets are ceft on high: blood burſts and ſmokes around. As the troubled noiſe of the ocean, when roll the waves on high; as the laſt peal of the thunder of heaven; ſuch is the noiſe of battle. The groans of the people ſpread over the hills. It was like the thunder of night, when the cloud burſts on Cona, and a thouſand ghoſts ſhriek at once on the hollow wind."

The ſublimity of the following paſſages is of a ſolemn and awful character:

"A dark red ſtream of fire comes down from the hill. Crugal ſate upon the beam: he that lately fell by the hand of Swaran, ſtriving in the battle of heroes. His face is like the beams of the ſetting moon. His robes are of the cloud of the hill. His eyes are like two decaying flames. Dark is the wound of his breaſt. The ſtars dim twinkled through his form; and his voice was like the ſound of a diſtant ſtream."

"Dim and in tears he ſtood, and ſtretched his pale hand over the hero; faintly he raiſed his feeble voice, like the gale of the reedy Lago. My ghoſt, O Connal! is on my native hills; but my corpſe is on the ſands of Ullin. Thou ſhalt never talk with Crugal, or find his lone ſteps in the heath. I am light as the blaſt of Cromla; and I move like the ſhadow of miſt. Connal, ſon of Colgar, I ſee the dark cloud of death. It hovers over the plains of Lena. The ſons of green Erin ſhall fall. Remove from the field of ghoſts. Like the darkened moon he retired, in the midſt of the whiſtling blaſt."

The following are inſtances of the other ſtriking characteriſtic of Oſſian's poetry, tenderneſs;—Gaul, the ſon of Morni, and the lover of Oithona, ignorant of the misfortune which had befallen her, comes to her reſcue, and propoſes to engage her foe in ſingle combat.

"And ſhall the daughter of Nuath live," ſhe replied with a burſting ſigh: "Shall I live in Tromathon, and the ſon of Morni low? My heart is not of that rock; nor my ſoul careleſs as that ſea, which lifts its blue waves to every wind, and rolls beneath the ſtorm. The blaſt which ſhall lay thee low, ſhall ſpread the branches of Oithona on earth. We ſhall wither together, ſon of car-borne Morni. The narrow houſe is pleaſant to me; and the grey ſtone of the dead; for never more will I leave theſe rocks, ſea-ſurrounded Tromathon. Chief of Struman, why cameſt thou over the waves to Nuath's mournful daughter? Why did I not paſs away in ſecret, like the flower of the rock, that lifts its fair head unſeen, and ſtrews its withered leaves on the blaſt? Why didſt thou come, O Gaul, to hear my departing ſigh? O had I dwelt at Davranna, in the bright beams of my fame. Then had my years come on with joy; and the virgins would bleſs my ſteps. But I fall in youth, ſon of Morni, and my father ſhall bluſh in his hall."

"No father mourned his ſon ſlain in youth; no brother, his brother in love; they fell without tears, for the chief of the people was low."

"And is the ſon of Semo fallen? ſaid Carril with a ſigh. Mournful are Tura's walls, and ſorrow dwells at Dunſcaich. Thy ſpouſe is left alone in her youth: the ſon of thy love is alone. He ſhall come to Brapla, and aſk her, why ſhe weeps. He ſhall lift his eyes to the wall; and ſee his father's

father's ſword. Whoſe ſword is that? he will ſay: and the ſoul of his mother is ſad."

The melancholy tenderneſs of Oſſian's poetry is alſo diſplayed in the following paſſage, in which the bard contraſts his preſent and his former ſtate.

"Such were the words of the bard in the days of the ſong; when the king heard the muſic of harps, and the tales of other times. The chiefs gathered from all their hills, and heard the lowly ſound. They praiſed the voice of Cona: the firſt among a thouſand bards. But age is now on my tongue, and my ſoul has failed. I hear ſometimes the ſhouts of bards, and learn their pleaſant ſong. But memory fails on my mind; I hear the call of years. They ſay, as they paſs along, why does Oſſian ſing? ſoon ſhall he lie in the narrow houſe, and no bard ſhall raiſe his fame. Roll on, ye dark brown years; for ye bring no joy in your courſe. Let the tomb open to Oſſian, for his ſtrength has failed. The ſons of the ſong are gone to reſt. My voice remains like a blaſt, that roars lonely on a ſea-ſurrounded rock, after the winds are laid. The dark moſs whiſtles there, and the diſtant mariner ſees the diſtant trees."

Beſides the ſublime and tender paſſages with which the poems of Oſſian abound, they are diſtinguiſhed by their ſtrong and lively deſcriptions, in which, often by a ſingle circumſtance, the picture is rendered moſt natural and impreſſive; the genius of the poet too lends to theſe deſcriptions all that intereſt, which pathetic reflection or tender feeling can beſtow; he ſeldom contents himſelf with the mere deſcription of natural ſcenery, without intermixing theſe peculiar traits of his diſpoſition and genius: this remark is moſt particularly exemplified in the following paſſage.

"I have ſeen the walls of Balclutha, but they were deſolate. The fire had reſounded within the halls; and the voice of the people is now heard no more. The ſtream of Clutha was removed from its place, by the fall of the walls; the thiſtle ſhook there its lonely head; the moſs whiſtled to the wind. The fox looked out of the window: the rank graſs waved round his head. Deſolate is the dwelling of Moina. Silence is in the houſe of her fathers."

We have room to particulariſe only one more of the excellencies of Oſſian's poetry; that is, the ſkill and effect with which he manages his ſimilies: the following is an inſtance.

"Wilt thou not liſten, ſon of the rock, to the ſong of Oſſian? My ſoul is full of other times; the joy of my youth returns. Thus the ſun appears in the weſt, after the ſteps of his brightneſs have moved behind a ſtorm. The green hills lift their dewy heads. The blue ſtreams rejoice in the vale. The aged hero comes forth on his ſtaff; and his grey hair glitters on the beam."

On the whole, the merits of Oſſian's poetry muſt be allowed to be great; it has alſo great faults: to thoſe whoſe judgment and taſte have been diſciplined by ſtudy, and formed on the models of antiquity, the faults will ſeem to counterbalance the beauties; but in the opinion of the multitude, the beauties will preponderate, and with them the poems of Oſſian will always be popular.

Almoſt as ſoon as the poems of Oſſian were given to the world by Macpherſon, doubts were raiſed concerning their authenticity; and theſe doubts were increaſed and ſtrengthened by the ſtrange and perverſe conduct of that gentleman: he pretended to have collected manuſcripts in the Highlands, from which he had tranſlated theſe poems; to have theſe manuſcripts, of undoubted antiquity as he maintained, in his poſſeſſion; and yet, when the poems were branded as forgeries, inſtead of ſilencing the ſceptics and accuſers by the production of theſe manuſcripts, he maintained a ſullen and obdurate ſilence. Beſides the unwillingneſs or inability of Macpherſon to produce the manuſcripts which he aſſerted he had diſcovered in the Highlands, or to name the perſons from whom he had received them, there were other ſuſpicious circumſtances affixed to theſe poems. The literati of England, and in an eſpecial manner Dr. Johnſon, pronounced them forgeries; and the latter was confirmed in his opinion (if confirmation he needed) when, in his journey through the Highlands, he could collect only very vague, general, but moſt peremptory and poſitive aſſertions, that the poems publiſhed by Macpherſon were authentic, and had been well known there for generations. The controverſy concerning their authencity, however, did not proceed to any length, or aſſume any regular and methodical form till the year 1800, when Mr. Malcolm Laing publiſhed his Hiſtory of Scotland; to the ſecond volume of this hiſtory he annexed a learned, moſt acute, and ingenious diſſertation on Oſſian's poems. In any controverſy which had been agitated on this ſubject, before Mr. Laing took it up, the whole jet of the argument and proof lay on the exiſtence, in tradition or manuſcript, of poems in the Highlands, compoſed by Oſſian, and ſimilar in all their leading features to thoſe publiſhed by Macpherſon: the internal evidence, though generally mentioned by the diſbelievers in their authenticity as ſtrongly in favour of their opinion, was never minutely and thoroughly examined, before Mr. Laing inveſtigated it. The objections to the authenticity of theſe poems may be thus ſtated and arranged.

1. It is highly improbable, that at the time when Oſſian lived, he could compoſe ſuch long and regular poems, without the uſe and aſſiſtance of letters; and the moſt ſturdy and zealous advocates for theſe poems, will not contend that letters were known in the Highlands in the third century. It may indeed be urged, that Homer compoſed his Iliad and Odyſſey, when he was equally a ſtranger with Oſſian to the uſe of letters; but of this aſſertion there is no proof; the preſumption on the contrary is, that in the time of Homer, letters were known in Greece. It is ſcarcely neceſſary to dwell on the poſition here laid down, that if letters were unknown in the Highlands in the time of Oſſian, that bard's compoſitions muſt have been very ſhort, and probably very irregular; certainly not of the deſcription of poems which Macpherſon publiſhed in his name, and which Dr. Blair, in his Diſſertation, has proved to be written in exact conformity to the rules which Ariſtotle lays down for the compoſition of an epic poem.

2. Even allowing that ſuch long and regular poems could have been compoſed without the uſe of letters; it is not credible, that they could have been tranſmitted from the time of Oſſian to the time of Macpherſon, or at leaſt to the time of the date of the moſt ancient manuſcripts found in the Highlands. This objection cannot be put in a ſtronger way, than in the words in which Hume has expreſſed it, in a letter to Gibbon. "It is indeed ſtrange, that any man of ſenſe could have imagined it poſſible, that above 20,000 verſes, along with numberleſs hiſtorical facts, could have been preſerved by oral tradition, during fifty generations, by the rudeſt, perhaps, of all civilized nations, the moſt neceſſitous, the moſt turbulent, and the moſt unſettled." There is nothing ſimilar to this in any other language, or among any other nation: the Gothic poems are all ſhort; the death ſong of Radnor Lodbrog, which is amongſt the longeſt pieces of Gothic poetry, ſuppoſed to be traditionally preſerved, extends but to twenty-nine octavo ſtanzas, of ſhort lines; and in order to relieve the memory in this and other Gothic poems, there is always a burden. Beſides, theſe

ballads were written only a few centuries before letters were common among the Gothic nations; and consequently, their preservation (independently of the circumstance of their shortness) cannot be considered as in the least similar to the supposed preservation of Ossian's poems.

When Macpherson first published his fragments in 1760, in order to prove their antiquity, he asserts, that "the diction is very obsolete, and differs widely from the style of such poems, as have been written in the same language two or three centuries ago;" and the Highland Society, in their Report, make use of a similar argument: "no modern could possibly write such Gaelic as the original given by Macpherson, in his Temora, any more than the best Greek or Latin scholars could write what would pass itself, on persons conversant in those languages, for the composition of Homer or Virgil;" and yet, in the same Report, it is stated, that the language in these poems is nearly what it still is in the common use and understanding of the country. These assertions evidently contradict one another; but let the believers in the authenticity of Ossian's poems choose which they please, it will equally militate against their belief. If the Gaelic of Ossian's poems, as published by Macpherson, is the Gaelic in the common use and understanding of the country at this day, then it is Gaelic, which might have been written by him; and the poems might have been forged by him; and the argument for their authenticity falls utterly to the ground: if, on the other hand, the Gaelic of these poems is such as no modern could possibly write, then they could not have been transmitted, either in manuscript or tradition; for, as Mr. Laing observes, "that the poems were preserved by oral tradition, in an obsolete diction, or, in other words, a dialect already disused by the people, is alone sufficient to confute their authenticity." If the poems are still current and popular in the Highlands, they must be understood; if understood, they must be written in a language familiar and similar to modern Gaelic; and if written in this language, they might have been forged.

3. The poems of Ossian, as published by Macpherson, are very dissimilar, in their sentiments and character, from other poems written in the same state of society. Dr. Blair, in his Critical Dissertation, after quoting the funeral song of Radnor Lodbrog (already referred to) observes, "this is such poetry as we might expect from a barbarous nation; it breathes a most ferocious spirit. It is wild, harsh, and irregular; but at the same time animated and strong: the style in the original, full of inversions, and as we learn from some of Olaus' notes, highly metaphorical and figured. But when we open the works of Ossian, a very different scene presents itself. When we turn from the poetry of Lodbrog to that of Ossian, it is like passing from a savage desert to a fertile and cultivated country." It might have been supposed, that the utter dissimilarity between the poetry of Ossian, and that of the Gothic nations, at nearly the same era, would have excited suspicions in the mind of Blair, respecting the authenticity of the former; instead of that, he enters into a learned disquisition to prove, that the Celtic nations were much more refined and civilized than the Goths; and that this superior refinement and civilization were owing to the establishment of the Druids among them. Let us grant, for a moment, that the Celtic nations were thus distinguished above the Goths; still this will not account for the character of Ossian's poetry; no state of society, but that in which very refined and subtle feelings are indulged, in which what may be styled the luxury of sentiment is known, could have produced such poems as those which were published by Macpherson. The Celts, if they were farther advanced in knowledge and civilization than the Goths, might have produced poetry free, in a great measure, from that ferocious spirit, and from that wildness, harshness, and irregularity, which Blair notices in the death song of Radnor Lodbrog; but it would still have retained many of the marks of a barbarous age. But the poetry of Ossian, as published by Macpherson, is not only unlike that of the Goths, but it is as unlike that Gaelic poetry, which is known to be genuine. The latter, as given to the world by Dr. Young, the Highland Society, &c. agrees in every respect with the idea which has always been entertained of the poetry of a rude people; the style of it is very unequal; "sometimes tame and flat; sometimes turgid and highly periphrastic: sometimes it rises into savage energy, and sometimes melts into natural tenderness." The manners exhibited in this genuine Gaelic poetry, also, are such as might be expected in a savage nation: in one of the poems given in the appendix to the Report of the Highland Society, Fingal knocks Carril on the head for disputing with him the property of a beef steak, dressed with onion sauce. Unless, therefore, we can bring ourselves to believe, that in the third or fourth century the Highlanders were superior in knowledge, refinement, and delicacy of feeling and sentiment, not only to their Gothic contemporaries, but even to most European nations at the present time; and that they afterwards became savage and unenlightened, we must doubt the authenticity of Ossian's poems.

4. The omission of religion, and of all specific and circumstantial notice of the manners and customs of the age, is a strong presumption against their authenticity. Macpherson was ignorant of the gods and rites of the Caledonians: according to his historical theory, the Druids had been expelled by the Fingalians; and it was not therefore to be supposed, that the latter would adopt the religion of the former: he had, therefore, no other alternative but to fill his poems with ghosts; in which there is no proof that the Celts believed, and which are not to be traced in any of the authentic Gaelic ballads. There is no source more ample and more accurate, from which the manners, customs, and mode of life of ancient nations can be drawn, than from their ballads: but on these points Ossian's poems preserve a guarded and suspicious silence. In the time of Macpherson's heroes, hunting was the principal amusement; and yet the wild cattle, the wolves, and the boars, are never mentioned.

5. The inconsistency of the events related in these poems, with the Roman history of Britain, and with the history of the middle ages, has been very able pointed out by Mr. Laing as one proof of their forgery. "The arrival or return of the Scots from Ireland, under Fergus Mac Erth, and his brother Loarn, is established by the concurrence of every Scottish and Irish historian; and their first arrival is marked by Bede, under Riada their leader, from whom their settlement was named Dalriada:" hence it is an historical fact, that there was not a Highlander in Scotland of the present race, at the beginning of the era assigned to Fingal. This observation will derive great additional weight, if we have proved that Fingal and his heroes belong originally to Ireland, and consequently, were probably introduced to the knowledge of the Highlanders, at the era of the Dalriadic settlement in Scotland. Fingal, in the poems published by Macpherson, is connected with Caracalla in 208, and with Carausius in 286; and his reign and exploits are prolonged in the Temora to the battle of Gabhra in 296; "with the same propriety (Mr. Laing observes), as if a youthful patriot, who resisted a union in the Scotch parliament, were again introduced at the end of the century, opposing a union with Ireland, in the British senate." Caracalla, the son of Severus (to use the words of Gibbon) "is

deſcribed by a nick-name invented four years afterwards, ſcarcely uſed by the Romans till after the death of that emperor, and ſeldom employed by the moſt ancient hiſtorians:" an awkward and unſatisfactory attempt has been made to get rid of this objection, by obſerving that Caracul, in Gaelic, means fierce-eyed. The Roman province of Valentia, into which Fingal is repreſented as having made an incurſion, did not then exiſt; and Dumbarton, which is mentioned in the poems, was not then built; Lochlin was certainly unknown in the third century, notwithſtanding Dr. Graham, in his reply to the objections of Mr. Laing, controverts this poſition, on the very doubtful authority of a MS. deſcribed by Dr. Donald Smith; and Orkney, in which Inniſtere is placed, if credit is given to the preciſe aſſertion of Solinus, rather than to the rhetorical period of Tacitus, was then uninhabited. It is unneceſſary to go through the hiſtorical detections drawn from the middle ages; they are equally numerous and deciſive; and are given with great acuteneſs and learning by Mr. Laing.

6. In oppoſition to theſe ſtrong preſumptions againſt the authenticity of Oſſian's poems, and to the internal evidence of their modern date, it would require the moſt unequivocal and full proof, that they had been actually collected by Macpherſon from tradition, or copied from ancient manuſcripts, in order to ſilence ſcepticiſm. But this proof is miſerably deficient, and, according to the acute obſervation of Mr. Laing "negative evidence with reſpect to the authenticity, becomes poſitive evidence with reſpect to the forgery of the poems." It appears from various letters publiſhed in the Report of the Highland Society, that Macpherſon, during his tour through the Highlands, viſited ſeveral people who were ſaid to poſſeſs MSS., or who were converſant in Gaelic poetry; that he aſſerted he had been very ſucceſsful in the purſuit of his object; and that to ſeveral he ſhewed ſome of the MSS. which he had procured, and from them tranſlated paſſages, which are ſtated to have been ſimilar to what he afterwards publiſhed. But this teſtimony is very vague and unſatisfactory: the ſpecific paſſages are not pointed out; the MSS. which Macpherſon ſhewed were not examined. In ſhort, the teſtimony afforded by theſe letters, is exactly of that ſort againſt which Dr. Johnſon proteſted: he found in the Highlands, many who maintained, that they were perfectly acquainted with Oſſian's poems before the time of Macpherſon; but he could get no direct and explicit anſwer, when he aſked which of the poems, or requeſted them to point out exactly the paſſages with which they had been previouſly acquainted.

With reſpect to the MSS. ſaid to have been procured by Macpherſon, he always refuſed to produce them, except one, which Mr. Laing examined, and which, inſtead of being a MS. of Oſſian's poems, is an Iriſh MS. in a character and language, which ſcarcely any Highlander can diſtinctly read; and which, as far as it has been made out, contains no poems either of Oſſian, or of any other bard. It has been already mentioned, that Macpherſon left a ſum of money for the purpoſe of publiſhing his Gaelic MSS. after his death; from ſome cauſe or other, their publication was delayed till the year 1807, when they appeared with a literal tranſlation into Latin, by the late Robert Macpherſon, A.M., together with a diſſertation on the authenticity of the poems, by ſir John Sinclair; a tranſlation on the abbé Ceſarotti's Diſſertation on the Controverſy, with notes, and a ſupplemental eſſay, by Dr. Mac Arthur; the work was publiſhed under the ſanction of the Highland Society of London. The editors of this work thought that they ſhould decide the controverſy; but there were certain awkward and troubleſome queſtions aſked: the Gaelic poems thus publiſhed, were all in Macpherſon's hand-writing; what had become of the MSS. which he pretended to have got in the Highlands, and from which, if they really exiſted, he muſt have made his copy? To this no ſatisfactory anſwer can be given. On the margin of the firſt edition of his Oſſian, Macpherſon marked, with his own hand, the time when the Gaelic was delivered to Mr. John Mackenzie, the ſecretary to the Highland Society; among theſe memoranda, the following are found, "delivered the three Duans of Cathlode, as *complete as the tranſlation.*" Does not this expreſſion warrant the belief that the Gaelic was written after the Engliſh; elſe why ſay, as complete as the tranſlation? It would be natural and proper to talk of a tranſlation being as complete as the original; but to ſpeak of an original being as complete as the tranſlation, would ſcarcely have occurred to any one, whoſe thoughts and language had not been at direct variance. Again, he ſays, "delivered all that could be found of Carthon;" but, if the Engliſh Carthon had been the tranſlation, why could he find little more than half the original from which the tranſlation was made? The mere circumſtance of the poems of Oſſian being publiſhed in Gaelic, from MSS. in Macpherſon's hand-writing, can prove nothing in favour of their authenticity; nor be a ſatisfactory anſwer to thoſe who called for MSS., before they would give up their ſcepticiſm; unleſs there had been ſatisfactory evidence, that this Gaelic Oſſian had been copied from old MSS; for Macpherſon could forge poems, as well in Gaelic as in Engliſh; and the undoubted facts, that he never would ſhew any old MSS; that he delayed publiſhing the Gaelic during his life-time, and that he was very ſlow in delivering it over to thoſe to whom he committed the publication, confirm the ſuſpicion of Mr. Laing, that he *tranſlated* his Engliſh Oſſian into Gaelic, and that this tranſlation he left for publication after his deceaſe.

7. Macpherſon publiſhed a poem called the Highlander, before he appeared as the tranſlator of Oſſian's poems: the ſimilarity between the Highlander and Oſſian in deſcription, ſentiment, manner, and ſtyle, is uncommonly ſtriking and cloſe; indeed Mr. Laing has proved that many paſſages of the former were tranſcribed by Macpherſon into his Oſſian. In a work publiſhed by Mr. Laing ſubſequently to his Diſſertation, he has detected in the poems of Oſſian many palpable and groſs plagiariſms from Homer, Virgil, and their two tranſlators; Milton, Thomſon, Young, Gray, Maſon, Home, and the Engliſh bible. Several of the inſtances given by Mr. Laing are undoubtedly ſtrained, and would never have been brought forward as proofs of plagiariſm, by a mind not warmed by a generous indignation againſt impoſture; but moſt of them are of ſuch a nature, as can leave no doubt that Macpherſon, in the compoſition of Oſſian's poems, either copied the authors we have mentioned, or was ſo fully imbued with their ſpirit, that even his own thoughts and expreſſions aſſumed the ſhape of theirs.

8. Macpherſon, in various paſſages of his prefaces and introductions, ſeems diſpoſed to acknowledge the impoſture, and to claim the higher merit of an original poet: in one place he ſays, "Thoſe who alone are capable of transferring ancient poetry into a modern language, might be better employed in giving originals of their own, were it not for that wretched envy and meanneſs, which affects to deſpiſe contemporary genius. I aſſure my antagoniſts, I ſhould not tranſlate what I could not imitate:" and in his preface he ſays, "without *increaſing* his genius, the *author* may have improved his language, in the eleven years that the poems have been in the hands of the public." And again, "in a convenient indifference for a literary reputation, the author hears praiſe without being elevated, and ribaldry with-

out being depreſſed:" and in the concluſion he ſays, "the tranſlator, *who cannot equal his original*, is incapable of expreſſing its beauties." Theſe paſſages, if taken by themſelves, would perhaps prove but little; but when conſidered in connection with all the other ſuſpicious circumſtances; with Macpherſon's inability to produce any ancient MSS.; with the plagiariſms contained in the poems; and with the internal marks of forgery which they diſplay; they tell ſtrongly againſt their authenticity. But there is more direct and poſitive proof that Macpherſon confeſſed the impoſture: the late venerable biſhop of Dromore, in a letter to a friend (quoted by the Britiſh Critic, for 1809, p. 275.) ſays, "I repeatedly received the moſt poſitive aſſurances from ſir John Elliot, the confidential friend of Macpherſon, that all the poems, publiſhed by him, as tranſlations of Oſſian, were entirely of his own compoſition. This I did not underſtand ſo ſtrictly as that Macpherſon might not have introduced ſome fragments of ancient Erſe poetry, preſerved by tradition; but that he had no genuine originals of Oſſian's compoſition. This, ſir John Elliot did not communicate to me as the reſult of one ſingle converſation, but what he was fully aſſured of, by repeated converſations, during the intimacy of many years."

9. In the year 1797, the Highland Society of Edinburgh appointed a committee to enquire into the nature and authenticity of the poems of Oſſian. By the direction of this committee, queries very diſtinctly and accurately worded, were tranſmitted to every one, who from perſonal knowledge, or opportunities of enquiry, was ſuppoſed capable of throwing light on the ſubject. In 1805, the report of this committee was publiſhed, ſanctioned by the name of Mr. Henry Mackenzie, chairman. The line of conduct purſued by the committee was very ſimilar to that which had been chalked out by Hume, in a letter to Blair, ſoon after the firſt appearance of the poems of Oſſian by Macpherſon. Dr. Blair had written to Hume reſpecting the reception, in England, of his diſſertation on theſe poems: Mr. Hume, in his anſwer, mentions the general incredulity of the Engliſh literati on their authenticity, ariſing partly from the behaviour of Macpherſon, who refuſed to ſatisfy any one who doubted of his veracity, and partly from the extreme improbability that ſuch long connected pieces ſhould have been preſerved by oral tradition for fourteen centuries. Mr. Hume there points out the line of conduct which it would be neceſſary for Dr. Blair to purſue, if he wiſhed to ſilence this general ſcepticiſm: "the teſtimonies may, in my opinion, be of two kinds. Macpherſon pretends that there is an ancient MS. of part of Fingal in the family, I think, of Clanranold; get that fact aſcertained by more than one perſon of credit: let theſe perſons be acquainted with the Gaelic: let them compare the original and the tranſlation; and let them teſtify the fidelity of the latter. But the chief point in which it will be neceſſary for you to exert yourſelf will be, to get poſitive teſtimony from many different hands, that ſuch poems are vulgarly recited in the Highlands, and have there been long the entertainment of the people. This teſtimony muſt be as particular as it is poſitive. It will not be ſufficient that a Highland gentleman or clergyman ſay, or write to you that he has heard ſuch poems: nobody queſtions that there are traditional poems in that part of the country, where the names of Oſſian and Fingal, and Oſcar and Gaul, are mentioned in every ſtanza. The only doubt is, whether any of theſe poems have any farther reſemblance to the poems publiſhed by Macpherſon. Generality muſt be carefully guarded againſt, as being of no authority."

It is evident from theſe precautionary directions that Mr. Hume was well aware of the looſe and unſatisfactory evidence which moſt probably would be produced in ſupport of the authenticity of Oſſian; and the Highland Society, notwithſtanding they tranſmitted very clear, preciſe, and diſtinct queries, received, in moſt caſes, only very general anſwers: ſuch was the impatient zeal, or ſuch the clouded underſtandings of the Highlanders on this ſubject, that they either would not permit themſelves to reply to any objections with an appeal to facts, or they miſapprehended the queſtion, and ſuppoſed it was the exiſtence of traditionary poetry reſpecting Oſſian and Fingal, and not the fidelity of Macpherſon's tranſlation, on which they were requeſted to give evidence. The conſequence was, that much of the evidence produced on the report of the Highland Society, is quite exceptionable, on the grounds which Hume ſtates and wiſhes to guard Dr. Blair againſt; and the evidence which goes to the point, only confirms that ſcepticiſm which it was intended to remove; ſince it only proves that there were in the Highlands MSS. and traditionary ballads, reſpecting Fingal and his heroes, attributed to Oſſian, of which ballads Macpherſon had made uſe, but which were *not* the originals of his poems.

In the report it is expreſsly admitted, "that the committee has not been able to obtain any one poem the ſame in title and tenor with the poems publiſhed by Macpherſon." This admiſſion is ſufficient to put the ſeal upon the queſtion of their forgery. The Highland Society, after this admiſſion, ſhould have diſdained the unworthy and ridiculous ſubſtitute to which they have had recourſe in order to *make out* ſomething like an original for ſome of Macpherſon's poems. The language of Mr. Laing in the following paragraph, though ſtern and harſh, is but too applicable to this diſingenuous expedient.

"Inſtead of complying with this plain and pointed requiſition, the committee of the Highland Society employed the late Dr. Smith to collect ſuch paſſages from theſe MSS. as might bear or acquire a remote affinity to Macpherſon's Fingal. For this purpoſe thirteen or fourteen modern MSS. were taken, containing many hundred pages, and conſiſting of different collections of Erſe and Iriſh poems. From this extenſive range, between twelve and fifteen hundred detached lines are ſelected, and pieced together with the moſt prepoſterous diligence, in order to preſent to the reader, by dint of tranſlation, ſomething like the plan and outlines of Fingal. No intimation is given of the particular ſongs or poems from which they are taken; but the references to the different pages are as deſultory as the lines themſelves are unconnected and detached." Mr. Laing then gives ſome ſpecimens of this mode of piecing poetry together; and concludes with this remark: "This, if practiſed in any other language than Erſe, would be deemed fabrication." This patch-work poetry has been happily likened to the expedient of brother Martin, in the Tale of a Tub, to diſcover authority in his father's will for wearing ſhoulder-knots: as they were not expreſsly mentioned, he ſought them firſt, *totidem verbis*, then *totidem ſyllabis;* and at laſt, all failing, *totidem literis*.

There can be no doubt that Macpherſon collected Gaelic poetry, and made uſe of it in his Oſſian; but his materials were few and ſcanty, and of a very different character, in every reſpect, from the poems which he conſtructed from them. Fingal is principally founded on a ballad narrating the invaſion of Ireland, by Magnus the Bare-footed: this ballad contains about fifty ſtanzas of four lines each; which Macpherſon has enlarged into ſix books, and thrown into the form of a regular epic poem. The ſtory of the ballad bears ſome reſemblance to that of Fingal; but in the former there

there is no mention of the battle between Cuthullin and Sivaran, nor of thofe circumftances related by Macpherfon in fuch detail, and by means of which he has fwelled Fingal into fix books. Befides this ballad of Magnus, Macpherfon, in the compofition of his Fingal, has made ufe of other fmall genuine pieces of Celtic poetry.

The battle of Lora, the next piece for which any authority has been difcovered, is founded on a poem called Erragon: the incidents are nearly the fame, but the manner of relating them, the fentiments and the language, are extremely unlike; and thefe fufficiently prove, that the peculiarities of Offian's poetry are, in fact, the offspring folely of Macpherfon's mufe.

Carthon, the next poem, is founded on the tale of Conloch, natural fon of Cuchullin, who being educated in Scotland, comes to Ireland, encounters his father there, without being known to him, and is flain by him. Macpherfon has altered the incidents in fome refpects; and as ufual, fubftituted his own fentiments and language. There is good reafon for fuppofing that the famous addrefs to the fun, with which this poem concludes, is not genuine. No Gaelic original has been difcovered for the death of Cuthullin. Darthula is well known in the Highlands under the name of *Devidre;* but Macpherfon has very materially altered the ftory. The ballad of Lammon Mor feems to have been the foundation of Macpherfon's "Luthmon;" but in the latter the ftory is told differently; and the night attack by Offian and Gaul, with the imagery which Blair extols, are not in the ballad. For the firft book of Temora there is fome authority, in a poem celebrating the fatal battle of Gabhra, in which Ofgur and moft of the Fions were flain: as, however, Macpherfon intended, when he publifhed the firft book of Temora, to add a fecond, he has omitted this catafrophe; and the Fions ftill live and fight. Such are the flender materials on which Macpherfon conftructed the pieces contained in his firft publication: for thofe contained in his fecond volume, no genuine authorities can be found.

The refult, therefore, of the enquiries of the Highland Society, muft be confidered as having finally and completely fettled the queftion refpecting the authenticity of Offian's poems. As publifhed by Macpherfon, they are much more his own, even in incidents, and moft efpecially, in fentiment, imagery, and language, than the compofition of Offian or any Celtic bard; and the ballads which he employed in their conftruction, or fuch as exift in MS. or in tradition in the Highlands, can on no pofitive or probable evidence be afcribed to Offian; nor indeed traced up to any particular bard or era.

If further information is wanted on this fubject, the following works may be confulted; "Laing's Differtation on Offian's Poems," annexed to the fecond volume of his Hiftory of Scotland. "The Poems of Offian, &c. containing the poetical works of James Macpherfon, efq. in profe and rhyme, with notes and illuftrations;" by the fame author. "Report of the Committee of the Highland Society of Scotland, appointed to enquire into the nature and authenticity of the Poems of Offian, drawn up according to the directions of the Committee by Henry Mackenzie, efq. with a copious appendix, containing fome of the principal documents on which the account is founded." "The Poems of Offian in the original Gaelic, with a literal tranflation in Latin, by the late Robert Macpherfon, A.M., together with a differtation on the authenticity of the Poems, by fir John Sinclair, bart. &c. publifhed under the fanction of the Highland Society of London." And "Eflays on the Authenticity of the Poems of Offian, in which the objections of Malcolm Laing, efq. are particularly confidered and refuted by Patrick Graham, D.D." &c.

Some forty years ago, meeting Mr. Macpherfon at the earl of Eglinton's, who prevailed on him to fing two or three airs that he had learned of his mother, who knew neither Engliſh nor muſic: but in the fame manner as our villagers keep alive the babes in the wood, and chevy chace, by tradition, fhe fung, in the Erfe language, melodies to words of Offian, which her fon had tranflated and adapted to the meafures and melodies of his mother's finging. The French, the Italians, and the Germans, having no doubts of the authenticity of the poems of Fingal and Offian, were extremely ftruck with the bold wildnefs and original ideas of thefe poems, and when at Hamburgh, we mentioned, in the company of the Milton of Germany, Klopftock, the being in poffeffion of the following melodies, which we wrote down for the firft time perhaps that they were ever received on paper, he moft earneftly intreated us to favour him with tranfcripts of thefe airs, which we readily promifed to do: but, to our great regret, we were never able to find them till two or three months after his deceafe. We therefore now give them a place on our plates, not only as curiofities, but to appeafe the manes of the fublime Klopftock. For the airs, fee *Plate Mufic* XLV.

OSSICULA AUDITUS, in *Anatomy*, the three fmall bones contained in the cavity of the tympanum. See EAR.

OSSICULA *Mufculorum*, in *Ichthyology*, a name given by authors to thofe oblong and flender bones which are fituated in the flefh of fome kinds of fifh between the mufcles: thefe, in the anterior part, and efpecially near the head, are of a forked fhape; but in the hinder part of the body, they are ufually fimple and flender. Thefe forts of bones are found in the following kinds of fifh: 1. In all the cyprini. 2. In the efoces. 3. In the clupeæ. 4. In the eels. 5. In the coregones. 6. In the ofmerus. 7. In the falmon kind. 8. In mackrel. And 9. In the ammodytes or fand-eel. In the five laft, thefe bones touch the fpine at one end, but in the others they no where come near it.

The ufe of thefe loofe bones feems to be, to ftrengthen and fupport the mufcles, that by this means they may be able the more forcibly to move the body, and turn it about: they are peculiar to fifh, no land animal having them.

OSSIFICATION, in *Anatomy*, the converfion into bone, as, for example, of a cartilage, in the natural procefs of formation of the fkeleton; or of any other texture, in diſeaſed changes of its nature. This procefs is defcribed under BONE.

OSSIFRAGUM, in *Botany*, a name given by Bartholine, and fome other writers, to a peculiar kind of grafs, growing in fome parts of Norway. It comes up early in the fpring, before any other grafs, and the cattle are tempted to eat it: but it emaciates them, and makes them ſickly; their back bones become protuberant if they feed any time on it, and their legs fo weak that they can hardly go. The remedy among the country people is a very bad one. They collect the bones of different animals, and break them into fmall pieces. The cattle greedily devour this fort of food when offered them in this diſeaſe, and there follows a fort of drivelling at the mouth for a conſiderable time, after which they become well. It is poſſible there may be much error in this ſtory. The kingdom of Norway is full of mines, and the effluvia of theſe may be the occaſion of the cattle's illneſs, and the ceaſing of theſe effluvia their cure; for it is not probable that either of theſe effects ſhould be owing to the graſs or the bones.

OSSIG, in *Geography*, a town of Sileſia, in the principality

pality of Neiſſe; three miles N.E. of Grotkau.—Alſo, a town of Saxony, in the biſhopric of Naumburg; four miles S. of Zeitz.

OSSIPAGINA, in *Botany*, a name given by Arnobius and ſome other of the old Greek writers to the *conſolida major*, or greater comfry. It had this name from its ſuppoſed quality of agglutinating broken bones on being taken internally.

The Greek writers have ſometimes called this plant *pecte*.

OSSIPEE, Ossapee, or *Oſapy*, in *Geography*, a poſt-town, mountain, and pond, in Stratford county, New Hampſhire, North America. The town was incorporated in 1785, and has 804 inhabitants. The lake lies N.E. of Winnipiſcogee lake, between which and Oſſapee lake is Oſſapee mountain. Its waters run E. and are joined by South river, from Great Oſſapee river, which diſcharges itſelf into Saco river, near the diviſion line between York and Cumberland counties in Maine, and between Limerick and Gorham.

OSSNOBIAN, Asseneboyne, *Indians*, a tribe found about the ſource of Oſſnobian or Aſſeneboyne river, far W. of lake Superior. The Moravian miſſionaries report, that they live wholly upon animal food, or that they reſtrict themſelves to the ſpontaneous productions of nature, denominating thoſe who dig the ground "ſlaves." Bread is unknown to them; and they reject it from their mouths, calling it rotten wood. Theſe Indians, as well as thoſe numerous nations who inhabit the country from lake Superior towards the Shining mountains, are great admirers of the beſt hunting horſes, with which the country abounds. The Oſſnobians have no permanent place of abode, and live wholly in tents made of buffalo and other hides, with which they travel from one place to another, like the Arabs: and as ſoon as the food for their horſes is expended, they remove, and pitch their tents in another fertile ſpot, and thus they emigrate, without ſcarcely ever returning to the ſame ſpots again.

OSSOLA, or Oscella, a diſtrict of Italy, between the Valais and lake Maggiora, about 35 miles in length and from 15 to 25 in breadth,; the country is compoſed of mountains and vallies, but is fertile and populous. The capital is Domo d'Oſcello.

OSSOLIN, a town of Poland, in the palatinate of Sandomirz; 20 miles W. of Sandomirz.

OSSOORAH, a town of Hindooſtan, in Bengal; 16 miles N. of Biſſunpour.

OSSORY, the name of a biſhopric in Ireland, the cathedral of which is at Kilkenny. It includes almoſt the whole county of Kilkenny, a good part of the Queen's county, and ſome of the King's county, extending 46 Engliſh miles in length and 29 Engliſh in breadth, and containing 136 pariſhes. Such, however, are the unions, that there are only 56 benefices, and of theſe 20 were without churches when Dr. Beaufort publiſhed. There is alſo a barony called Oſſory, which gave the title of earl to the eldeſt ſon of the dukes of Ormond.

OSSUN, a town of France, in the department of the Upper Pyrenées, and chief place of a canton, in the diſtrict of Tarbes; ſix miles S.S.W. of Tarbes. The place contains 1200, and the canton 10,558 inhabitants, on a territory of 160 kiliometres, in 15 communes.

OSSUNA, an ancient and well-peopled town of Spain, in the province of Seville. It derives great advantage in caſe of a ſiege, from a fountain in the middle of it, which furniſhes water to the inhabitants, whilſt the whole country, for eight miles round, is totally deſtitute of that neceſſary article. When Cæſar beſieged Oſſuna, he was obliged to bring his proviſions, and particularly water, from a great diſtance; 45 miles miles N.E. of Seville.

OST, in *Rural Economy*, a term applied to the kiln for drying hops. See Kiln, and Oost.

OSTADE, Adrian Van, in *Biography*, one of the very firſt claſs among the Flemiſh painters, was born at Lubeck in 1610, and was a diſciple of Frank Hals, in company with Brouwer, with whom he contracted a cloſe intimacy.

The choice of Oſtade in the ſubjects he repreſented is ſomewhat ſimilar to that of Teniers, but he treated them in a manner totally diſtinct, though not with ſo lively and ſpirited a touch, or ſo light and clear a management of his materials; yet with more care, more truth, and fullneſs of nature in the effects of colour and of chiaro-ſcuro, and with a great deal more meaning in the actions and expreſſions of his figures. Theſe it muſt be confeſſed are generally of the loweſt claſs, vulgar and groſs in form, and in habits; and placed where uſually ſuch objects are to be found, in dirty hovels: yet among ſuch animals little better than brutes, engaged in actions of groſs gratification, ſuch is the power of his pencil, ſo agreeable are the hues he employs, and the arrangement of light and ſhade in which they are diſpoſed, that the moſt refined eye dwells upon his pictures with delight. He ſurprizes our judgment into implicit admiration, by a truth of character, and energy of effect, which precludes the foundation of cenſure.

It is true his pictures are not always of ſuch low ſubjects, but he never riſes to any thing like gentility in character, and very ſeldom attempted it. His works are too highly laboured to be very numerous, and are, therefore, to be bought only at high prices. He was ſo much eſteemed by contemporary artiſts, that many of the moſt eminent ſolicited him to put the figures in their landſcapes, which by that means received an additional value. Oſtade died in 1685, at the age of 75.

His younger brother, Iſaac Van Oſtade, was taught by him the art of painting, and imitated the ſtyle and taſte of his inſtructor; but he died young, and never arrived at any degree of ſkill in the art comparable to that of his brother. As, however, he wrought in the ſame manner, and upon the ſame kind of ſubjects, ſome of his original productions, and many of his copies from Adrian, are palmed upon amateurs as the works of the elder Oſtade. But the diſparity is eaſily diſcernible by the judicious, the touch is not ſo free, the colouring not ſo tranſparent; nor have they an equal warmth or force of effect, in compariſon with each other.

OSTALRIC, in *Geography*, a town of Spain, on the Tordera; 22 miles S.W. of Gerona.

OSTANO, a town of Italy, in the department of the Lario; 10 miles N. of Como.

OSTASCHKOV, a town of Ruſſia, in the government of Tver, near the lake Seliger; 80 miles W. of Tver. N. lat. 56° 50'. E. long. 33° 34'.

OSTBY, a town of Sweden, in Angermanland; 60 miles N. of Hernoſand.

OSTE, a river, which riſes in the S. part of the duchy of Bremen, paſſes by Bremervorde, &c. and runs into the Elbe, at its mouth. N. lat. 53° 54'. E. long. 8° 54'.

OSTELLATO, a town of Italy, in the department of the Lower Po; 14 miles S.E. of Ferrara.

OSTEN, a town of Germany, in the duchy of Bremen; 11 miles N.W. of Stade.

OSTEND, a ſtrong ſea-port of France, in the department of the Lys, and chief place of a canton, in the diſtrict of Bruges. The town contains 10,800, and the canton 12,854 inhabitants, on a territory of 35 kilometres, in three communes. The harbour is good, and takes its name from its eaſtern ſituation. It is ſurrounded by a great number of forts,

forts, and ten baſtions, and has four gates. This place, which at firſt was a ſmall village, became a town in 1072; and was encompaſſed with walls in 1445 by Philip the Good, who erected gates, enlarged the town, and made the harbour more commodious. It was regularly fortified in 1583 by the prince of Orange. In the year 1601 it was beſieged by the archduke Albert, and in September 1604, above three years after it had been firſt inveſted, the garriſon and inhabitants, who had for this long interval, with equal ſkill and bravery, defended themſelves againſt the moſt vigorous and determined aſſailants, and after a ſacrifice of 100,000 brave ſoldiers, obtained the moſt honourable terms of capitulation. In the year 1706 it was beſieged by ſome troops of the allied army, and after an obſtinate reſiſtance the garriſon ſurrendered on capitulation. The States, having put in a garriſon of their own troops, kept it till the year 1715, when, in conſequence of the barrier treaty, they yielded it up to the troops of the empreſs. In 1722 the court of Vienna eſtabliſhed an Eaſt India company at Oſtend; but in the year 1731 this company was diſſolved. In 1745 Oſtend was taken by the French, but reſtored to the empire at the peace of Aix-la-Chapelle. At the cloſe of the year 1792 it was taken by the French, but evacuated in the following year. In 1711 the preſent town-houſe, which is a magnificent and handſome edifice, was begun and completed. The magiſtracy is compoſed of a bailiff, a burgo-maſter, ſeven echevins, and a treaſurer; the office of bailiff is for life, and the other officers are annually changed. At Oſtend they have no freſh water, which is brought in boats from Bruges, and preſerved in a large reſervoir near the harbour. The town was evacuated by the troops of the allies in July 1794. N. lat. 51° 13′. E. long. 11° 52′.—Alſo, a town of Africa, on the Ivory Coaſt; 30 miles N.E. of Cape Palmas.

OSTENSIO, a tax anciently paid by merchants, &c. for leave to ſhow, or expoſe their goods to ſhow and ſale in markets.

OSTENSIVE Demonstrations, ſuch as plainly and directly demonſtrate the truth of any propoſition.

In which they ſtand diſtinguiſhed from *apagogical* ones, or reductions *ad abſurdum*, or *ad impoſſibile*, which prove the truth propoſed, by demonſtrating the abſurdity or impoſſibility of the contrary.

Oſtenſive demonſtrations are of two ſorts: ſome barely, but directly, prove the thing to be; which they call ὅτι. Others demonſtrate the thing from its cauſe, nature, or eſſential properties; and theſe are called in the ſchools διότι. See Demonstration.

OSTEOCOLLA, ὀστεοκόλλα, in *Natural Hiſtory*, a white, or aſh-coloured ſparry ſubſtance, ſhaped like a bone, and by ſome ſuppoſed, without ſufficient reaſon, to have the quality of uniting broken bones; on which account it is ordered in ſome plaſters.

It is found in long, thick, and irregularly-cylindric pieces, which are uſually hollow, but are ſometimes filled up with a marly earth, and ſometimes contain within them the remains of a ſtick, round which the oſteocolla had been formed; but though it is plain from thence, that many pieces of oſteocolla have been formed by incruſtations round ſticks, yet the greater number are not ſo; but are irregularly tubular, and ſeem formed of a flat cake, rolled up in a cylindric ſhape. The cruſts of which theſe are compoſed do not form regular concentric circles round the internal cavity, as muſt have been the caſe had they been formed by incruſtation, but ſhewing plainly that they were once ſo many thin ſtrata, compoſing a flat ſurface, which has afterwards been rolled up as one might do a paper three or four times doubled, into two, three, or more ſpiral lines; in which caſe, each ſingle edge of the paper would be every where a regular part of a continued ſpiral line drawn from a given point; but they would by no means be ſo many detached concentric circles.

The oſteocolla is found of various ſizes, from that of a crow-quill to the thickneſs of a man's arm. It is compoſed of ſand and earth, which may be ſeparated by waſhing the powdered oſteocolla with water, and is found, both in digging and in ſeveral brooks, in many parts of Germany, and elſewhere.

Oſteocolla is called *hammoſteus* in many parts of Germany. It has this name in theſe places from the obſervation of its always growing in ſand, never in clay, or any ſolid ſoil, nor even in gravel. Where a piece of it any where appears on the ſurface, they dig down for it, and find the branches run ten or twelve feet deep. They uſually run ſtraight down, but ſometimes they are found ſpreading into many parts near the ſurface, as if it were a ſubterraneous tree, whoſe main ſtem began at twelve feet depth, and thence grew up in a branched manner, till met by the open air. The main trunk is uſually of the thickneſs of a man's leg, and the branches that grow out from it are thickeſt near the trunk, and thinner as they ſeparate from it. The thinneſt are about the ſize of a man's finger. The people employed to collect this oſteocolla, when they cannot find any mark of it on the ſurface, ſearch after the ſpecks of white or little lumps of whitiſh ſoft matter, which they find lying in different parts on the top of the ſand. Theſe always lead them either to a bed of perfect oſteocolla, or to ſome in the formation. If they miſs of the ſubſtance which they ſeek after, they ſtill find the ſubſtance like rotten wood; which, when traced in its courſe, is found to proceed from a main trunk, at the depth of that of the oſteocolla, and to ſpread itſelf into branches in the ſame manner. The diggers call this ſubſtance the flower of oſteocolla, or hammoſteus.

The oſteocolla found in the earth is at firſt ſoft and ductile, but in half an hour's time, if expoſed to the air, it becomes as hard as we find it in the ſhops. The method to take up a perfect piece for a ſpecimen is to open the ground, clear away the ſand, and leave it ſo for an hour or thereabouts: in this time it will harden, and may be taken out whole. It is certain that the oſteocolla is produced at this time; for, if a pit be cleared of it, there will more grow there in a year or two, but with this difference, that it will be ſofter and will not harden ſo eaſily in the air as the other. What the rotten ſubſtance reſembling the decayed branches of trees is, it is not eaſy to ſay, unleſs it really be ſuch: but the opinion of the common people, that it is the root of ſomething, is abſurd; becauſe its thickeſt part always lies at the greateſt depth, and the branches all run upwards. The oſteocolla is a marly ſpar, which concretes round this matter; but what it is that determines it to concrete no where on the ſame ground but about theſe branches it is not eaſy to ſay. The rottenneſs of this ſubſtance, which forms the baſis of the oſteocolla, renders it very liable to moulder and fall away; and hence it is that we uſually ſee the oſteocolla hollow. Sometimes it is found ſolid, but in this caſe there will be found to have been a vegetable matter ſerving as its baſis, and inſtead of one branch, it will be found in this caſe to have concreted about a number of fibres, the remains of which will be found in it on a cloſe examination. Phil. Tranſ. N° 39.

Osteocolla-*Flower*. See Flower.

Osteocolla-*Root*. See Root.

OSTEOCOLLON, in *Botany*, a name given by ſome authors to the great comfry.

This

This name was given by ſome of the old writers to the ſymphytum, or comfry, from an opinion that its agglutinating quality reached to the bone, and that it was of great ſervice taken internally, in caſes of fractures.

OSTEOCOPOS, or OSTOCOPOS, formed from οστεον, *bone*, and κοπτειν, *to break, cut*, or *cleave*, is uſed by ſome for an acute pain, in which the patient is affected as if his bones were breaking.

It riſes from a ſharp humour vellicating the periofteum, or membrane, with which the bones are inveſted. It is particularly incident to ſcorbutic and pocky perſons.

OSTEOGENIA is a technical term applied to the formation of the bones.

OSTEOGONY. See OSSIFICATION.

OSTEOGRAPHIA is a deſcription of the bones; a title which has been given to ſome anatomical works.

OSTEOLOGY is that diviſion of *Anatomy* which treats of the bones. The organiſation of the bones, and the progreſs of their formation, have been conſidered under the articles BONE in *Anatomy*, BONE in *Chemiſtry* and the *Arts*, and EMBRYO. The particular bones are deſcribed in various articles of this work: thoſe of the head in CRANIUM; of the vertebral column in SPINE; of the cheſt in LUNGS; and of the limbs in EXTREMITIES. A deſcription of the marrow will be found under MEDULLARY *Syſtem*; and for the articulations by which the bones are connected, ſee JOINT.

OSTEOSARCOMA, or OSTEOSARCOSIS, in *Surgery*, a ſwelling, the conſiſtence of which is partly bone and partly fleſh. Alſo the diſeaſe called *mollities oſſium*.

OSTEOSPERMUM, in *Botany*, ſo named in alluſion to its hard, bony ſeeds, and derived from οστεον, *bony*, and σπερμα, *ſeed*. Linn. Gen. 448. Schreb. 585. Willd. Sp. Pl. v. 3. 2365. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 275. Juſſ. Gen. 183. Lamarck Dict. v. 4. 659. Illuſtr. t. 714. Gærtn. t. 168. (Monilifera; Vaill. Mem. Par. 1720. f. 28. Chryſanthemoides; Tournef. Mem. Par. 1705. f. 4. Dill. Gen. 9. Elth. 68.)—Claſs and order, *Syngeneſia Polygamia Neceſſaria*. Nat. Ord. *Compoſitæ Diſcoideæ*, Linn. *Corymbiferæ*, Juſſ.

Gen. Ch. *Common calyx* ſimple, hemiſpherical, of numerous, awl-ſhaped, minute leaves. *Cor.* compound, radiated; *florets* of the diſk perfect, numerous, tubular, five-toothed, the length of the calyx; thoſe of the radius female, about ten in number, ligulate, linear, three-toothed, very long. *Stam.* (in the perfect florets) Filaments five, capillary, very ſhort; anthers united into a cylindrical tube. *Piſt.* (in the perfect florets) Germen very ſmall; ſtyle thread-ſhaped, ſcarcely as long as the ſtamens; ſtigma emarginate: the female or ligulate florets differ in having their germen globoſe and a ſomewhat longer ſtyle. *Peric.* none, except the unchanged calyx. *Seeds* (in the perfect florets) none: (in the female ones) ſolitary, nearly globoſe, coloured, indurated by age, and incloſing a kernel of the ſame ſhape. Down none. *Recept.* naked, flat.

Eſſ. Ch. Receptacle naked. Down none. Calyx of many leaves. Seeds globular, coloured, bony.

Obſ. Of this extenſive and rather ſhowy genus we find only twelve ſpecies deſcribed in the *Species Plantarum*. In the 14th edition of *Syſt. Veg.* fifteen are enumerated, and to theſe Profeſſor Martyn has added two more. Willdenow however has extended the genus to twenty-three ſpecies, from which we ſelect the following for illuſtration.

O. *ſpinoſum*. Prickly Oſteoſpermum. Linn. Sp. Pl. 1308. Jacq. Hort. Schoenbr. v. 3. 66. t. 377.—Leaves obovate, ſerrated, downy. Permanent flower-ſtalks ſpinous.—Native of the Cape of Good Hope, flowering in September and October. *Stem* round, branched, erect, from two to ſix feet high, ſhrubby, denudated and ſcarred when old. *Branches* woolly when young, rather rigid, terminating in ſpinous, branched ſtalks, each bearing one flower. *Leaves* ſcattered, on ſtalks, attenuated at their baſe, obtuſely pointed, thickiſh, ſlightly webbed with down, glaucous. *Flowers* ſtar-like, ſolitary, yellow, having a ſweet ſmell.

O. *piſiferum*. Smooth Oſteoſpermum. Linn. Sp. Pl. 1308. (O. fruticans, lanuginoſum, foliis oblongis dentatis; Burmann. Afric. 171. t. 61. f. 2.)—Leaves ovato-lanceolate, pointed, ſlightly ſtalked, ſmooth, ſerrated.—This native of the Cape was cultivated in 1757, by Mr. Philip Miller. *Stem* four or five feet in height, much branched upwards, in a ſpreading manner. *Bark* purpliſh. *Leaves* thick and ſucculent, alternate, light green. *Flowers* ſolitary, yellow, on long, axillary ſtalks. *Seeds* oval, at firſt green, then red, and afterwards dark purple.

O. *moniliferum*. Poplar-leaved Oſteoſpermum. Linn. Sp. Pl. 1308. (Chryſanthemoides africanum, populi albæ foliis; Tournef. Dill. Elth. v. 1. 80. t. 68. f. 79.)—Leaves obovate, ſerrated, ſtalked, ſomewhat decurrent.—Native of the Cape. It was introduced into this country in 1714, though it flowers but rarely. *Stem* ſhrubby, ſeven or eight feet in height, much branched, and covered with a ſmooth grey bark. *Leaves* alternate, very thick and fleſhy, covered with a hoary down; their ſtalks, according to Linnæus, have a knob under their baſe. *Flowers* cluſtered, at the ends of the branches, yellow, reſembling thoſe of *Senecio Jacobæa*.

O. *ilicifolium*. Holly-leaved Oſteoſpermum. Willd. n. 5. (O. foliis ſcabris, ſinuoſis, denticulatis; Burmann. Afric. 172. t. 62.)—Leaves oblong, with angular teeth, rough, half embracing the ſtem. Branches furrowed.—Native of the Cape of Good Hope. *Stem* ſhrubby, branched, about two feet high, rather lax. *Leaves* ſhaped much like thoſe of our Common Holly, ſeſſile, involute at the margin, rough on the upper ſide, villoſe and almoſt woolly beneath. *Flowers* terminal, ſtalked, yellow.

O. *cæruleum*. Blue-flowered Oſteoſpermum. Willd. n. 7. Jacq. Ic. Rar. v. 1. t. 179. (O. pinnatifidum; L'Herit. Stirp. Nov. 11. t. 6.)—Leaves pinnate; ſegments toothed.—Native of the Cape. It flowers with us from June to September. This ſhrub is about three feet in height, with a ſtrong ſmell. *Root* woody, branching, fibrous. *Stem* woody, erect, round, regularly branched, grey. *Leaves* pinnate, alternate, ſpreading; ſegments oblong, acute, ſerrated; ſtalks half the length of the leaves, ſcarcely downy. *Flowers* terminal, in a looſe corymb, ſtalked, erect, blue. *Seeds* ſomewhat angular and rugged, but, according to L'Heritier, not at all bony.

The remaining ſpecies of *Oſteoſpermum* which occur in Willdenow, and which do not appear to be anywhere figured, are as follows. *O. ſpineſcens, rigidum, bipinnatum, arctotoides, perfoliatum, niveum, herbaceum, hirſutum, Bidens, ciliatum, junceum, corymboſum, ſcabrum, incanum, triquetrum, tereti-folium, imbricatum*, and *polygaloides*. They are all natives of the Cape of Good Hope, and all, except *rigidum*, are taken from Thunberg's Prodromus.

OSTEOSPERMUM, in *Gardening*, compriſes plants of the ſhrubby exotic kind for the greenhouſe, of which the ſpecies cultivated are; the prickly oſteoſpermum (O. ſpinoſum); the ſmooth oſteoſpermum (O. piſiferum); the poplar-leaved oſteoſpermum (O. moniliferum); and the blue-flowered oſteoſpermum (O. cæruleum).

*Method of Culture.*—Theſe plants may be increaſed by cuttings of the young ſhoots, which may be planted in any of the ſummer months, upon a bed of light earth, being watered

watered and ſhaded until they have taken root, when they muſt be taken up and planted out ſeparately in pots; as when they are ſuffered to ſtand long, they are apt to make ſtrong vigorous ſhoots, and be difficult to tranſplant afterward, eſpecially the ſecond and third ſorts; but there is not ſo much danger of the firſt, which is not ſo vigorous, nor ſo eaſy in taking root as the other. In the ſummer ſeaſon the pots ſhould be frequently removed, to prevent the plants from rooting through the holes in the bottoms of the pots into the ground, which they are very apt to do when they continue long undiſturbed, and when they ſhoot very luxuriantly; and on their being removed, theſe ſhoots, and ſometimes the whole plants, are deſtroyed.

As the plants are too tender to live in the open air in this climate, they ſhould be placed in the greenhouſe in October, and be treated in the ſame manner as myrtles, and other hardy greenhouſe plants, which require a large ſhare of air in mild weather; and in the beginning of May the plants removed into the open air, and placed in a ſheltered ſituation during the ſummer ſeaſon. As the firſt and ſecond ſorts are very thirſty plants, they ſhould have plenty of water.

Theſe plants afford variety among others of the greenhouſe kind.

OSTER, in *Geography*, a town of Ruſſia, in the government of Kiev, at the conflux of the rivers Oſter and Deſna; 24 miles N. of Kiev. N. lat. 50 58′. E. long. 31 14′.

Oster *Cappeln*, a town of Weſtphalia, in the biſhopric of Oſnabruck; 10 miles E.N.E. of Vorden.

Oster *Oen*, an iſland near the coaſt of Norway; 20 miles N.W. of Bergen.

OSTERBURG, a town of Weſtphalia, in the Old Mark; 36 miles N.W. of Brandenburg. N. lat. 52° 48′. E. long. 11° 56′.

OSTERBY, a town of Sweden, in the province of Upland, remarkable for its furnaces, and near the iron-mine of Dannemora, which is one of the largeſt and richeſt in Sweden; 24 miles N. of Upſal. See Dannemora.

OSTERFELS, a town of Saxony, in the biſhopric of Naumburg; 7 miles S.E. of Naumburg. N. lat. 51° 5′. E. long. 11° 53′.

OSTERHOFEN, a town of Bavaria, on the Danube, 20 miles N.W of Paſſau.

OSTERHOLZ, a town of the duchy of Bremen, the inhabitants of which are employed in digging peat or turf, which they ſell, to the annual amount of 18,000 rix-dollars, to the people of Bremen; 7 miles E. of Bremen.

OSTERLOF, a town of Sweden, in the province of Schonen; 8 miles N. of Chriſtianſtadt.

OSTERMAN, *Count*, in *Biography*, a celebrated Ruſſian miniſter, was the ſon of a clergyman at Bockhum in Weſtphalia. Being, in his youth, taken into the ſervice of the Ruſſian admiral Cruys during his reſidence in Holland, he accompanied that officer in 1704 as his private ſecretary. In the courſe of a few years, he was preſented by the admiral to Peter the Great, as every way qualified to write his diſpatches; his firſt eſſay ſo well pleaſed his ſovereign, that he immediately made him his ſecretary, and in this ſituation he ſoon gained the confidence of his employer. He thus roſe, ſtep by ſtep, to the moſt important offices in the government, and the emperor was ſo much his friend, that he brought about a marriage between him and a lady connected with ſome of the nobleſt families in Ruſſia. He preſerved his influence in Ruſſia during the reigns of ſeveral ſovereigns; but in the revolutions that placed the empreſs Elizabeth on the throne, he became involved in the ſame diſgrace as counts Munic and Lowenwolde. He was even condemned to ſuffer death, but his puniſhment was commuted for perpetual baniſhment in the deſolate regions of Siberia, where he died in the year 1747, in the ſame place where Mentizoff had ended his days ſome years before. After his death his wife and family were recalled, and their property and rank reſtored to them. Count Oſterman poſſeſſed a ſound judgment, and was capable of the moſt indefatigable labour; no miniſter of the ſame period was ſo well acquainted with the intereſts of the different courts of Europe, and in the exerciſe of his official duties none could be more diſintereſted and incorruptible; but he was ſuſpicious and overbearing, and he expected all his coadjutors to give way to whatever he propoſed. This, however, is very generally the caſe with great minds. "His mode of expreſſing himſelf," ſays his biographer, "was ſo artful and obſcure, that few could flatter themſelves that they were able to diſcover his true meaning. His ſtyle alſo, in general, was ſo ambiguous, that whatever he wrote might be explained two different ways. Though he was completely maſter of his feelings, and would appear to participate in things which were contrary to his conviction, he was ſo much afraid of betraying his real ſentiments by external emotions, that he never looked thoſe full in the face with whom he converſed." Gen. Biog.

OSTERMARK, in *Geography*, a town of Sweden, in Eaſt Bothnia; 18 miles N.E. of Chriſtianſtadt.

OSTERO, a ſmall iſland on the E. ſide of the gulf of Bothnia. N. lat. 63° 23. E. long. 21° 39′.

OSTEROD, a town of Norway; 28 miles N.N.W. of Drontheim.

OSTERODE, a town of Weſtphalia, in the principality of Grubenhagen, on the Saal, containing about 800 houſes, and a magazine of corn, which is delivered out to the miners of Harz foreſt always at a fixed price. The town has alſo a manufacture of woollen ſtuffs; 16 miles W. of Goſlar. N. lat. 51° 44′. E. long. 10° 6′.

OSTEROE, one of the Faroe iſlands, E. of Stromoe, and ſeparated from it by a narrow channel. N. lat. 61° 50′.

OSTERRODE, a town of Pruſſia, in the province of Oberland, on the river Dribentz, defended by a caſtle; 45 miles S.E. of Dantzic. N. lat. 53° 36′. E. long. 19° 52′.

OSTERSUND, a town of Sweden, and capital of Jamtland, on the E. ſide of the lake Storſio; 95 miles W.N.W. of Hernoſand. N. lat. 63° 10′. E. long. 14° 27′.

OSTERSUNDAM, a town of Sweden, in the province of Nyland; 9 miles N.E. of Helſingfors.

OSTERTZ, a town of Croatia; 14 miles S.W. of Varaſdin.

OSTERWALD, John Frederic, in *Biography*, was born at Neufchatel in the year 1663. He commenced his academical ſtudies at Saumur, and ſo rapid was the progreſs which he made in them, that he was admitted to the degree of M. A. before he was ſixteen years of age. He afterwards purſued his ſtudies at Orleans and Paris, and was admitted to the office of the miniſtry. He ſettled as paſtor to the church of his native place in 1699, and contracted an intimate friendſhip with the celebrated John Alphonſus Turretin of Geneva, and Samuel Werenfels of Baſil, and the union of theſe three theologians, which was called *the triumvirate of Swiſs divines*, laſted till their deaths. Oſterwald died in 1747, at the age of 84. He was author of ſeveral uſeful works written in the French language, of which the principal are; 1. A Catechiſm of the Chriſtian Religion; 2. Arguments and Reflections on the Books of the Bible; 3. Treatiſes on Uncleanneſs, and on the Sources of Corruption; and 4. A Collection of Sermons. His ſon, John Rodolph Oſterwald, was paſtor of the French church at Baſil. Moreri.

OSTERWICK, in *Geography*, a town of Pomerelia; 10 miles S.S.E. of Dantzic.—Alſo, a town of Weſtphalia, in the principality of Halberſtadt, ſeated on the Ille, containing ſeveral woollen manufactures; 15 miles N.E. of Goſlar. N. lat. 51° 59′. E. long. 10° 33′.

OSTHAMMAR, a ſea-port of Sweden, in the province of Upland, formerly a ſtaple-town, ſituated on a ſmall rocky iſland, called "Gold Sheor," in the Aland's Haff, near the coaſt; 30 miles N.E. of Upſal. N. lat. 60° 15′. E. long. 18° 19′.

OSTHEIM, a town of Germany, in the county of Henneberg; 8 miles S.W. of Meinungen.

OSTIA, in *Anatomy*, a term uſed indifferently with oſcula, orifices, &c. for the mouths or apertures of the body; as the *oſtia vaginæ*, &c.

Ostia, or *Oſti*, in *Geography*, a ſea-port town of Italy, and the ſee of a biſhop, ſituated 13 miles from Rome, at the mouth of the Tiber, whence it derived its name. This port was firſt conſtructed and the town ſurrounded by walls, in the time of Ancus Martius. The harbour was reckoned one of the moſt magnificent and ſtupendous of the Roman works; but it was ruined by the accumulation of ſand, and by the change of the courſe of the river, which ran into the ſea by another arm. In the 16th century, when the remains of this Auguſtan port were ſtill viſible, the antiquarians ſketched the plan (ſee d'Anville, Mem de l'Acad. des Inſcriptions, tom. xxx. p. 198.) and declared, with enthuſiaſm, that all the monarchs of Europe would be unable to execute ſo great a work. Oſtia Tiberina, the two mouths of the Tiber, were ſeparated by Holy Iſland, of an equilateral form, each of whoſe ſides was eſtimated at two miles. In the time of Strabo, the harbour was ſo choaked, that the iſland was augmented, and the town and port were left at a conſiderable diſtance from the ſhore.

In the third or fourth century, Oſtia was erected into a biſhopric; the old town was deſtroyed by the Saracens; and the new one conſiſts only of a cathedral, and of a few mean houſes built round it. The air here is very indifferent. N. lat. 41° 46′. E. long. 12° 13′.

OSTIAKS, a denomination comprehending three tribes of people, connected with the Finns and the Samoyedes. In the conqueſt of Siberia, by the Tartars, they contemptuouſly called all the inhabitants of this extenſive country, whilſt they knew only a ſmall part of it, "Uſchtyæk," a word denoting a foreigner or barbarian. This denomination was at firſt retained by the Ruſſians from ignorance, and has been ſince loſt in proportion as the diverſity of the Siberian nations has been detected. At preſent there remain three very diſtinct people, both in deſcent and language; *viz.* the Oſtiaks of the Oby, of the Marym, or Narym, and of the Yeniſſey; the firſt of theſe tribes belongs to the ſtock of Finns. The Oſtiaks of the Southern Oby call themſelves Aſyaks, from the river Oby, which in their language is called Yak; the northern, Khondi Khui, people of Konda, becauſe they withdrew from that river towards the north. Both ſtems dwell at preſent about the Oby and the Irtiſh, in the government of Tobolſk, and derive their origin from the Permians, from whom they probably ſeparated to avoid biſhop Stephen's barbarous zeal for making converts. If this derivation were as certain as it is probable, from the ſimilitude of the languages, they muſt ſurely have had ſome very urgent motive for quitting their mild and gentle ſky on the W. ſide of the Ural, for the inclement regions of the Oby. The Oſtiaks of the Oby are held to be one of the moſt numerous of the Siberian nations; but accurate ſtatements of the amount of their population are wanting.

The Narym Oſtiaks, who are alſo called Moraſes, are about the upper parts of the Surgut, in the diſtricts of the Oby quite to the Narym, and about the mouths of the rivers Ket and Tom.

The Yeniſſey Oſtiaks, though they reſemble the two other nations of that name in appellation and mode of life, yet ſpeak a language ſo entirely different from that of the Oſtiaks, as well as from all the Siberian tongues, that they might rather be taken for races of a particular nation, though not the ſmalleſt indications of their origin have been hitherto diſcovered. Theſe dwell about the inferior Yeniſſey, near and between the Samoyedes. When the Ruſſians, in the 17th century, had extended their conqueſt hither, theſe Oſtiaks not only immediately ſubmitted, but alſo aſſiſted the Ruſſians to ſubdue the neighbouring nations. In proportion to the dimenſions of the ground they occupy, they are not numerous. Tooke's Ruſſ. vol. i.

OSTIANO, a town of Italy, in the department of the Upper Po; 12 miles N.E. of Cremona.

OSTIANY, a town of Lithuania, in the palatinate of Wilna; 40 miles S.E. of Wilna.

OSTIARY, one of the five inferior orders in the Roman church, whoſe office is to keep the doors of the church, and to toll the bell.

OSTICO, in *Geography*, a ſmall lake of America, in Onondago county, New York, which ſends its waters from the N. end by a ſtream 16 miles long to Salt lake.

OSTIGLIA, a town of Italy, in the department of the Mincio; 10 miles E.S.E. of Mantua.

OSTIMURI, a town of New Mexico, in the province of Hiaqui; 40 miles E. of Riochico. N. lat. 29° 12′. W. long. 110° 56′.

OSTINATO, Ital., in *Muſic*, obſtinate, perſevering in a theme or ſubject, without variety.

OSTINES, or Charlestown, in *Geography*, a conſiderable town in the iſland of Barbadoes.

OSTINGHAUSEN, a town of Germany, and ſeat of a prefecturate, in the duchy of Weſtphalia; 8 miles W. of Lippſtadt.

OSTIONES, a ſmall iſland in the Pacific ocean, near the coaſt of America. N. lat. 4° 10′.

OSTRACH, a river of Germany, which runs into the Danube, about a mile below Scheer.

OSTRACION, or *Trunk-fiſh*, in *Ichthyology*, a genus of fiſhes of the order Branchioſtegous, of which the generic character is; teeth round, pointing forwards, blunt; aperture of the gills linear; body mailed by a complete bony covering. It has no ventral fins. There are twelve ſpecies, which are as follow:

Species.

Triqueter. The ſpecific character of this is, that it is triangular-bodied, and unarmed. It is about twelve inches in length, and is, as its name imports, of a trigonal ſhape, the ſides ſloping obliquely from the ridge of the back, and the abdomen being flat: the whole animal, except to within a ſmall diſtance from the tail, is completely enveloped in a bony covering, divided into hexagonal ſpaces, and covered, as is the caſe in the whole genus, with a tranſparent epidermis, like that of the armadillo among quadrupeds: the uſual colour is a ſubferruginous brown, with a white ſpot in the centre of each hexagon, which is alſo marked by fine rays diverging from the centre to the edges. It is a native of the Indian and American ſeas, and is ſuppoſed to feed on ſmaller cruſtacea, ſhell-fiſh, and ſea-worms. It is conſidered as an excellent fiſh for the table, and is held in high eſtimation among the inhabitants of India.

Trigonus. Triangular; two ſubcaudal ſpines; the dorſal

ſal fin is fourteen-rayed. It inhabits India. It is ſaid to make a kind of grunting noiſe when firſt taken, owing to the ſudden exploſion of air from its branchial orifices.

Biaculeatus. This is the triangular-bodied trunk-fiſh, with two ſubcaudal ſpines, and ten rays in the dorſal fin. There is a variety, the body of which is covered with ſpots and tubercles. They are found in India, and are thought by ſome naturaliſts to be varieties of the O. trigonus.

Tricornus. Triangular, with two frontal ſpines and one dorſal. It is about ten inches long; in the front of the head there are two ſhort pointed ſpines, directed forwards; above the naked part of the body, near the tail, is a long upright pointed ſpine: the ſhield is divided into hexagons, each obſcurely marked into triangular ſpaces. It is a native of India.

Quadricornus. Triangular, with two frontal and ſubcaudal ſpines. It inhabits India and Guinea.

Turritus. This is nearly quadrangular; the eye-brows and back with a ſingle ſpine; the belly with four on each ſide. It inhabits the Red ſea, and is four inches long; the body tuberculate, yelloviſh-aſh, brown on the naked parts; the bony coat is divided into hexagonal pieces, that are rough with numerous elevated dots, the ſutures pellucid; the ſhell of the belly very broad, flat, oval, tapering on the fore-part, and obtuſe behind; the back is convex, marginate at the ſides; the middle is gibbous, compreſſed, triangular, with an erect ſhort ſpine, turned back; the front is perpendicular, rounded, convex, depreſſed beneath the eyes; the iris is golden.

Cornutus. Quadrangular-bodied trunk-fiſh, with two frontal and two ſubcaudal ſpines. The length of this fiſh is about eight or ten inches; the ſhape is ſquariſh; broad and abrupt towards the head, and tapering conſiderably towards the hind part; the back is nearly ſtraight; the cruſt or mail is ſtrongly marked into large hexagons; from the top of the head project two ſtrong, lengthened, ſharp ſpines, pointing ſtraight forwards; and on each ſide the anal fin is a ſimilar ſpine pointing directly backwards; the tail is long, large, and of an oval ſhape; the colour of the whole animal is yelloviſh-brown, and deeper beneath; the tip of the tail is duſky. It is a native of the Indian and American ſeas.

Auritus. Brown; one ſpine over each eye; two on each ſide the back, and two on each ſide the belly. It inhabits near the iſlands of the Pacific ocean, was obſerved during the voyages of captain Cook, and a ſpecimen is preſerved in the Britiſh Muſeum.

Tuberculatus. Quadrangular, unarmed, with four dorſal tubercles. It inhabits India.

Gibbosus. Quadrangular, unarmed, gibbous. It inhabits Africa, and is thought to be a variety of O. triqueter above deſcribed.

Cubicus. Quadrangular, unarmed; ſides flattiſh. It reſembles the O. triqueter, but has a ſquare body. The mail is marked into tuberculated hexagons, each of which has a white or blueiſh central ſpot, ſurrounded with a darker border: the ground colour of the whole mailed part is a pale yelloviſh-brown; of the naked or projecting part towards the tail yelloviſh-brown, with a few duſky variegations; the tail and fins are of a reddiſh-brown. It is a native of the Indian ſeas, and is ſaid to be an excellent fiſh for the table, and to be kept for that purpoſe in reſervoirs, growing ſo familiar as to come at a given ſignal to the ſurface of the water, and take its food from the hand.

Meleagris. This is ſomewhat ſquare; blackiſh, ſpeckled with white. It inhabits the Southern ocean; is from ſix to eight inches long, and beautifully marked with almoſt innumerable white ſpots. It is a native of the Indian ſeas, and was often obſerved during captain Cook's voyages about the coaſts of New Holland, Otaheite, &c.

Theſe are the ſpecies enumerated in Gmelin's edition of Linnæus; we ſhall now mention three others deſcribed in Dr. Shaw's Zoology.

Concatenatus; Triangular-bodied unarmed trunk-fiſh, with whitiſh concatenated variegations. The habit of this ſpecies is very like to that of the trigonal and triangular trunk-fiſh, but with a leſs elevated back; the mail is marked into triangular, ovate, and other ſhaped ſpaces, in a kind of reticular pattern; the colour is brown, the lines dividing the ſpaces being of a pale roſe-colour; the fore-parts and abdomen of the ſame colour; the end of the body is brown; tail and fins pale brown. It is a native of the American ſeas.

Nasus; Whitiſh ſubquadrangular-bodied trunk-fiſh, with brown concatenated variegations. The habit of this is approaching to that of the preceding ſpecies, but more ſlender; the head is very convex; the colour is greeniſh-white, or aſh, with the mail marked into very large hexagons, by means of broad, ovate-lanceolate, blackiſh lines, with ſimilar ones radiating from the centre of the hexagons, and thus elegantly dividing the whole into triangles, with finer lines or margins accompanying each; the naked or projecting part of the body, towards the tail, is marked with round black ſpots; the fins and tail are of a reddiſh-brown. It is a native of the Indian and American ſeas.

Striatus. Trunk-fiſh with yellow and blue ſtripes, and a ſpine over each eye, two on each ſide the back and abdomen, and one on each ſide the body. This in ſize and habit is very like the O. auritus; the colour is a beautiful variation of bright blue and yellow, in the form of lines diſpoſed in different directions, but principally in a longitudinal one over the whole fiſh; above each eye is a ſtrong ſpine, as in the auritus. On the ridge of the back are two pair, diſpoſed as in that ſpecies; and on each ſide the abdomen there are three, the middle of which is higher than the reſt. It is doubted whether this fiſh be a mere ſexual difference of the preceding: or, it is thought the auritus may be in reality no other than the preſent animal changed in colour, from the circumſtance of its having been long preſerved in ſpirits of wine. It was obſerved by Capt. G. Tobin, about the coaſts of Adventure bay, in Van Diemen's land.

OSTRACISM, οστρακισμος, a kind of popular judgment or condemnation among the Athenians; being a ſentence of baniſhment againſt perſons, whoſe too great power rendered them ſuſpected to the people; or whoſe merit and credit gave umbrage leſt they ſhould attempt ſomething againſt the public liberty, and their power degenerate into tyranny.

It had the denomination oſtraciſm, becauſe the people gave their votes, by writing the name of the perſon to be baniſhed in a ſhell, by the Greeks called οστρακον, and caſting the ſhells into an urn.

This kind of baniſhment had nothing infamous in it, as not being for a crime; but, on the contrary, was held very honourable, as it was a mark of popularity.

It laſted for ten years; but the baniſhed perſon had the full enjoyment of his eſtate all the time.

Oſtraciſm was null, unleſs there were 6000 citizens in the aſſembly of the people, whereby it was decreed.

OSTRACITES, in *Natural Hiſtory*, a name given by authors to the foſſile oyſters, common in many parts of England. Theſe are of various ſhapes and kinds; and the name is by ſome authors made to ſignify the ſhell itſelf, when preſerved in its native ſtate and condition; as is the caſe with thoſe found about Woolwich and Blackheath; and by

others, the ſtones caſt or formed in thoſe ſhells, or in cavities from whence they have been waſhed away and diſſolved: in both theſe caſes the ſtone carries the exact reſemblance of the ſhell, even in its niceſt lineaments; in the firſt caſe, bearing every mark of the inſide, in the other of the outer ſurface. We have this ſtone in great plenty in many parts of England; and it is very famous, in ſome places, for its virtues in caſes of the gravel, and the like complaints.

It is to be obſerved that all the foſſile ſhells, and particularly the *lapides Judaici*, or Jew's ſtones, which have been the ſpines of ſea echini, have been eſteemed diuretics, and good in the ſtone and gravel. Among the ancients, Dioſcorides, Pliny, and all the reſt, recommend them highly.

Dr. Home, in the Philoſ. Tranſ. ſays, the oſtracites rather diſſolves the little ſtones than forces them out, as not being remarkably diuretic. He adds, that he preſcribes it in powder, with a third part of flores chamæmeli. The doſe is from half a drachm to a whole one, in white wine.

Ostracites is alſo the name of a kind of cadmia, found at the bottom of furnaces where copper is purified. It is very heavy, and in ſtructure reſembles an oyſter-ſhell; whence its name.

It has been eſteemed aſtringent and deterſive; and introduced as an ingredient in ſeveral unguents.

OSTRACODERMATA, a term uſed by Ariſtotle to expreſs that claſs of ſhells which we call *teſtaceous*, in oppoſition to the cruſtaceous animals, or malacoſtraca.—The definition Ariſtotle gives of this claſs of animals is, that they are ſoft within, but hard without; that their ſhells may be bruiſed or broken, but their parts cannot be torn from one another, as they can in the cruſtaceous kind, ſuch as the lobſter; whoſe ſhell covering the legs, body, tail, &c. being ſo many diſtinct pieces of ſhell, and only joined by membranes, may be torn aſunder by pulling till thoſe membranes give way. Philoſ. Tranſ. N° 219. p. 199.

OSTRAU, or Ostrow *Mahriſch*, in *Geography*, a town of Moravia, in the circle of Prerau, on a river of the ſame name, on the borders of Sileſia; 20 miles S.E. of Troppau. N. lat. 49° 47'. E. long. 18° 17'.

Ostrau, a town of Moravia, in the circle of Hradiſch, on an iſland in the river Marſch; 7 miles S. of Hradiſch.

OSTRAVA, or Ostrawiec, a river which ſeparates the principality of Teſchen from Moravia, and runs into the Oder, 5 miles S. of Oderburg.

OSTREA, the Oyſter, in *Natural Hiſtory*, a genus of the claſs and order Vermes Teſtacea. Animal a tethys; ſhell bivalve, generally with unequal valves, and ſlightly eared; hinge without teeth, but furniſhed with an ovate hollow, and moſtly lateral tranſverſe grooves. Of this genus there are one hundred and thirty-ſix ſpecies, divided into two ſections, which ſections are likewiſe ſubdivided. Moſt of the ſpecies of this genus are furniſhed at the hinge internally with numerous parallel internal grooves in each valve, and they are diſtinguiſhed from the genus Arca, in not having teeth alternately locking in each other.

Section A. The ſpecies in this ſection have valves furniſhed with ears and radiate; denominated Scallop. Theſe leap out of the water to the diſtance of half a yard, and opening the ſhells, eject the water within them; after which they ſink under water, and ſuddenly cloſe the ſhells with a loud ſnap. This ſection is ſubdivided into three ſubſections, *viz.* (*a*) equilateral; ears of the valves equal, containing forty ſpecies: (*b*) ears unequal, one of them generally ciliate with ſpines within, containing fifty-four ſpecies: and (*c*) valves more gibbous on one ſide; in this ſubſection there are ſeven ſpecies.

*a. Equilateral; ears of the valves equal.*

Species.

* Maxima. Shell with fourteen rounded longitudinally ſtriate rays. This is delineated by Mr. Donovan in his Britiſh Shells. There are two other varieties deſcribed by Liſter and Knorr. Theſe are found in moſt European ſeas, in large beds; whence they are dredged up, and pickled and barrelled for ſale. This is the ſhell that was formerly worn by pilgrims on the hat or coat, as a mark that they had croſſed the ſea, for the purpoſe of paying their devotions in the Holy Land, in commemoration of which it is ſtill preſerved in the arms of many families. The ſhell is five or ſix inches long, and rather broader; the ears are large, with decuſſate ſtriæ; the hinge with a large deep hollow; lower valve convex, white, often varied with red bands or ſpots; the upper valve is flat and reddiſh.

* Jacobæa. Shell with about fourteen angular and longitudinally ſtriate rays. It inhabits European ſeas, and is leſs than the laſt. The grooves of the ſhell are tranſverſely ſtriate; the upper valve is flat; the lower valve with angular rays; the ears are concave and ſmooth on the upper ſide.

Ziczac. Shell with flattened rays. It inhabits the American ocean; ſometimes of one colour, ſometimes variegated; the ears are very finely wrinkled; the lower valve is convex, with from eighteen to twenty rays, which are very finely ſtriate tranſverſely, and about twice the number of perpendicular ſtriæ within. The upper valve is flat.

Striatula. Shell with ſixteen faint rays with tranſverſe membranaceous ſtriæ; the margin very entire. It is found in the Indian ocean. The ſhell is middle-ſized, varied with purple and white, within yelloviſh.

Minuta. Shell with twenty convex rays. It inhabits the Indian ocean. The ſhell is about the ſize of a nut; lower valve white and very convex; upper valve white clouded with brown, flatter and plaited.

Pleuronectes. Shell equivalve, with twelve doubled rays, and ſmooth on the outſide. It inhabits the Indian ocean; it is ſometimes reddiſh, or of a fleſh-colour, or liver-colour; within it is ſilvery. There is a variety of an orange-colour radiate with red; it is four inches and a half long, and gaping at each end.

Laurentii. Upper valve ſub-convex, ſmooth, with fine perpendicular lines croſſing very fine concentric tranſverſe ſtriæ; lower valve with twenty-four rays and forty-eight ſtriæ within. It is found on the ſhores of South America, and is very rare. The ſhell is nearly three inches long, and about as broad.

Japonica. Shell equivalve, a little convex, margined with yellow; upper valve with faint lines croſſing concentric tranſverſe bands, and forty elevated ſtriæ within. It is found on the ſhores of Guinea and Japan; is about five inches and a half long and broad, and reſembles the O. pleuronectes, but is coarſer and thicker.

Magellanica. The ſhell of this is likewiſe equivalve, glabrous, with oblong crowded ſtriæ. It is found in the ſtraits of Magellan; it reſembles the O. pleuronectes. The ſhell is lateritious, not radiate, quite ſmooth within; upper valve more convex; lower valve flatter than in moſt others, the ears are tranſverſely ſtriate.

Hybrida. Shell with nine or ten rays, the interſtices longitudinally ſtriate; margin repand within. It inhabits the Norway ſeas; thin, lower valve white, upper valve ſanguineous, with angular veins and lines.

Radula. Shell nearly equivalve, with twelve convex rays croſſed by crenate ſtriæ. It is found in the Indian ocean;

ocean; is three inches and a quarter long, and two and a half broad. The ſhell is oblong, white, or varied with white and brown; the lower valve is a little more convex; ears wrinkled and furrowed with oblique ſtriæ.

Imbricata. Shell nearly equivalve, with nine unequal rays imbricate with ſcales. It is found on the ſhores of the Red ſea, and reſembles the laſt. The colour of the ſhell is whitiſh with purple ſpots, and a little crenate at the margin; the rays alternately larger.

Subrotunda. Shell roundiſh, with eight convex cheſnut rays; ears roundiſh, white with a yellowiſh border. The ſhell is one inch and a half long and two inches broad.

Plica. Shell nearly equivalve, with ſix convex ſmoothiſh rays, and ſtriate acroſs. It inhabits India, is about one inch and a quarter long and an inch broad. The ſhell is white, or white ſpotted with brown, or red ſpotted with white; the tranſverſe ſtriæ are placed at a diſtance from each other.

Crenata. Shell roundiſh with convex rays, the outer ones finely ſtriate longitudinally; margin deeply crenate. The ears are tranſverſely ſtriate.

* Sinuosa. Shell ovate with very numerous and fine ſtriæ; the margin crenate within. It inhabits the Britiſh ſeas; ſhell varied with ſaffron.

Squammosa. Shell oblong with ſcaly rays, the interſtices broader, and marked with perpendicular ſtriæ. The ſhell is varied with angular lines and ſpots; ears wrinkled perpendicular.

Dubia. Shell roundiſh, with eighteen rays imbricate with ſcales. The ſhell is nearly half an inch long; ears ſtriate tranſverſely.

* Subrufa. Shell with twenty ſmooth rays, the interſtices tranſverſely ſtriate; margin crenate. This is deſcribed and figured in Donovan's Britiſh Shells. It is found on the Britiſh ſhores, and is about two inches long, and two inches broad.

Versicolor. Shell flattened, with eighteen ſmooth rays, the interſtices cancellate. The ſhell is of a pale yellow, white, ſea-green, blackiſh, or red; ears tranſverſely ſtriate.

Rosea. Shell roundiſh, with five rays. The ſhell is middle-ſized, roſy, with white rays, or green, mixed with yellowiſh, lurid, and leek-green, with livid rays.

Fusca. Shell brown, with flat rays that diſappear towards the hinge. It inhabits the Indian ſea. The ſhell is white within; lower valve convex, upper valve flat.

Tenuis. Shell thin, flat, purple, with very minute perpendicular ſtriæ croſſing circular tranſverſe ones; within the ſtriæ are elevated.

Lutea. Shell thin, pale yellow, with thick rays.

Muricata. Shell roundiſh and white, with a mixture of ſaffron; the rays convex, and very finely and ſharply muricate.

Conspersa. Shell roundiſh, tawny, dotted with white and black; the rays are thick.

Nodulosa. Shell roundiſh, brown, with black tranſverſe lines and dots; the rays are convex and knotty.

Radiata. The ſhell of this ſpecies is thin; the colour is whitiſh-roſy, with white ſtripes; the rays convex.

Punctata. Shell oblong, pale yellow, ſpotted with white; beaks varied with white and brown; the rays are crenate. The ſhell is about two inches long; ears cancellate.

Aculeata. The ſhell is thin, varied with roſy and whitiſh; in form it is rather roundiſh; the rays are thick, with aculeate ſcales.

Plana. Shell thin, flat, white, with a ſaffron hinge; the rays are round and broad.

Pusilla. Shell oblong, red, and very minutely ſtriate.

Flavescens. Shell convex on each ſide, and yellowiſh within; the rays are convex.

Fabellum. Shell roundiſh, deep red, with a white hinge, and a few ſpots. The rays are ſmooth.

Spondylades. Shell glabrous red; the ears are equal.

Violacea. Shell flattiſh on each ſide, the outſide brown, the inſide violet. It inhabits the Mediterranean.

Aurantia. Shell roundiſh, plaited, and very finely ſtriate longitudinally, with a white ſemicircular band towards the hinge.

Vittata. Shell purple within; without with alternate brown and red bands; the rays are convex.

Miniata. Shell white, with confluent red ſpots; the rays rough; the convex valve with tranſverſe criſp lamellæ. The ſhell of this ſpecies is about an inch and a half long, and the ſame in breadth.

Inflata. Shell convex on each ſide, cloſed, oblong, pellucid, with thirty-two rays. This is a very rare ſpecies, is ochraceous, thin, and twice as long as it is broad.

*b. Ears unequal, one of them generally ciliate, with ſpines within.*

Species.

Pallium; Ducal Mantle. Shell equivalve, with twelve convex rays; the ſcales are ſtriate, rough, and imbricate. There are two other varieties. They are found in India. The ſhell is ſolid, red, varied with brown and white; ears ſtriate, crenate, or ſcaly, one of them longer; margin of the ſhell denticulate.

Sanguinolenta. Shell equivalve, with nine thick obtuſe rays; the interſtices longitudinally ſtriate, tuberculate, prickly. It is found in the Red ſea; reſembles the laſt. The ſhell is white, with ſanguineous ſpots; the margin with crenate plaits, the border purpliſh; ears with tranſverſe nodulous ſtriæ.

Maculosa. Shell equivalve, pale yellow, with tawny ſpots; twelve rays thick and flattiſh; ears white, with dull ferruginous marks, and tranſverſe ſcaly ribs.

Nodosa. Shell with nine rays, covered with apparently veſicular tubercles. There are three varieties. They inhabit the American and African ocean. The ſhell is ſometimes red or ſcarlet, ſometimes varied with red and white, or tawny and white, mixed with yellow; the upper valve is more convex than the lower; the ear is ſpinous within and beneath.

Pes Felis. Shell with nine ſtriate rough rays; one of the ears very ſmall. It is found on the ſhores of Africa; is ſmall, thin, pellucid, generally pale fleſh-colour, ſpotted and veined; within glabrous white, with ſubundulate rays and crenate plaits on the margin; the ears with tranſverſe knotty ſtriæ.

Pellucens. Shell nearly equivalve, with nine rays, ſmooth, with ſpoon-like hemiſpherical ſcales on the lower valve. It inhabits the African ſeas; is ovate, minute, pellucid, glabrous, white; the upper valve ſpotted with red.

Obliterata. Shell ſmooth on the outſide, with twenty-four doubled rays. It inhabits the Indian ocean. The ſhell is marked with very fine decuſſate ſtriæ; the lower valve pale reddiſh and yellowiſh at the hinge; upper valve dirty red or pale tawny.

Sanguinea. Shell equivalve, with twenty-two rough rays; the ears are ſmall. It inhabits the Mediterranean, Atlantic, and American ſeas. The ſhell is round and flattiſh, red, ſcarlet, or tawny; the ſpaces between the rays are longitudinally ſtriate.

* Varia.

* Varia. Shell equivalve, with thirty compreſſed rays beſet with tranſverſe prickly ſcales; one ear very ſmall. It is found in moſt European ſeas; varies very much in colour, from pale yellow to various ſhades of orange and brown, with ſometimes a few white ſpots. The ſhell is rather convex, with rough jags or ſpinous protuberances down the rays; ſpaces between the rays not ſtriate; one ear very ſmall, with a double row of ſpines; the other with wrinkled plaits, and armed beneath with from five to ſeven ſpines.

* Pusio. Shell equivalve, with about forty filiform rays, the ſurface often irregular or diſtorted. This is figured in Donovan's Britiſh Shells. It is found in the European, Atlantic, and American ſeas. The ſhell is generally ſmall, and a little longer than it is broad; ſometimes it is ſeen with a ſmooth ſurface, but moſtly with an irregular waved ſurface, as if deformed by an accident: in its colours and marks it is very variable, but commonly it is of a fine red; one of the ears is very ſmall, the other ſharply ſpined beneath.

* Obsoleta. Shell ſmooth, equivalve, ſemitranſparent, dark purple, with eight nearly obſolete rays. Inhabits Britiſh coaſts; three quarters of an inch long. Shell thin, the valves equal and ſhallow, within ſmooth and brown, with a pearly gloſs; outſide dull purpliſh-brown, with numerous longitudinal ſtriæ between the rays; ears very unequal, wrinkled.

Lævis. Shell very ſmooth; ears ribbed. Inhabits Angleſea and Falmouth, is more than half an inch long.

Glabra. Ears nearly or quite equal. Shell equivalve, with from ten to fifteen ſmooth flattiſh rays; the inſide with elevated double ſtriæ. It inhabits the European and American ſeas; nearly two inches long, and as many broad; roundiſh; red, yellow, or brown, ſpotted or clouded, ſometimes white, with the upper valve ſpotted with brown; margin repand.

* Opercularis. Shell with about twenty rays, roundiſh and rough, with decuſſate ſtriæ; the upper valve a little more convex. There is a variety of this ſpecies. It inhabits the Northern ſeas of Europe; and is two inches and a half long and broad. The ſhell is gaping, generally variegated with ſpots and other marks; rays acute, ſometimes rounded; margin repand and toothed within; ears with decuſſate wrinkled ſtriæ, the larger one emarginate and ſpinous under the inciſure. In Devonſhire and Cornwall, where it is found, it is called *frill* or *queen*.

Gibba. Shell equivalve, gibbous, with twenty glabrous rays. It inhabits the American and Atlantic ſeas. The ſhell is convex on each ſide, red, with ſometimes a few white ſpots, and marked with fine crenate longitudinal ſtriæ; margin crenate; ears nearly equal.

Sulcata. Shell white, with fleſh-colour ſpots; the rays glabrous, thirty-two on the lower valve, and twenty-five on the upper. It inhabits the ſhores of Malabar; is about one inch and a half long, and ſomething broader; margin plaited, crenate; lower valve with an emarginate ſpinous ear, upper valve flattened.

Histrionica. Shell thin, flattened, pellucid, with very fine tranſverſe wrinkles, and eleven rays. The ſhell is ſpotted with red, white, and black; rays waved; ears nearly equal.

Islandica. Shell orbicular, with purple circles, and about one hundred rays. It inhabits the Mediterranean, in innumerable varieties. The ſhell is three inches and a half long, and three inches and a quarter broad; ſometimes whitiſh, but moſtly mixed with a fine pale bloom or yellowiſh, and marked with tranſverſe ſemilunar bands; upper valve more elegantly marked, with from fifty to one hundred rays, rough with acute imbricate ſcales; margin crenate; ears with tranſverſe ſcaly ſtriæ, the large one emarginate and ſpinous: the fiſh is eaten.

Triradiata. Shell nearly equivalve, glabrous, immaculate, with very minute ſtriæ. It is found among fuci in the ſeas of Norway. The ſhell is red, with ſmall white ſpots, within reddiſh; upper valve with three rays; ovary of the fiſh yellowiſh.

Fuci. Shell nearly equivalve, ſtriate, ſpotted, rough towards the margin. It inhabits the North ſeas, on the Fucus ſaccharinus. The ſhell is rufous, with whitiſh or paler ſpots, within red, and quite ſmooth, with pellucid ſpots; rays of the upper valve obſolete; ovary of the fiſh rich red.

Tigerina. Shell nearly equivalve, ſtriate, glabrous, red with whitiſh ſpots. It inhabits the North ſeas, on fuci: lower valve more deeply grooved, and varied with large undulate confluent pale yellow ſpots; upper valve dotted; ovary of the fiſh white.

Septemradiata. Shell nearly equivalve, ſtriate, glabrous, with ſeven convex rays. It inhabits the Northern ſeas.

Arata. Shell nearly equivalve, within and without grooved and red; one part rough, the other glabrous. It inhabits the North ſeas.

Senatoria. Shell convex each ſide, with twenty-two rounded and tranſverſe wrinkled rays, the interſtices with longitudinal granulate ſtriæ. It inhabits the Indian ocean; two inches nine lines long, and about as much broad; outſide cheſnut varied with violet and white; inſide violet, the circumference bordered with dull bay.

Citrina. Shell orange, with twenty-two rounded rays and plaited margin; lower valve flatter. It inhabits India; ſome of the rays are ſcaly, and ſome of the grooves have granulate lines.

Turgida. Shell equally convex, both ſides with twenty glabrous rays, the interſtices with tranſverſe crowded wrinkles; the margin with plaited teeth. It is found in the American and Indian ſeas.

Sulphurea. Shell flattened, thin, pellucid, ſtriate, with numerous imbricate rays; the margin with crenate plaits. It inhabits the Red ſea; is two inches long and a little narrower. The ſhell is thin, fragile, of a ſulphur or orange colour, ſometimes red with an orange hinge and a ſemilunar white band, or varied with white and pale tawny, with a ſanguineous border; lower valve with equal rays, thoſe of the upper valve alternately leſs.

Porphyrea. Shell convex, purple, within white or red, with twenty-five thick rounded ſcaly rays. It is found in the Red ſea; two inches three lines long, and as much broad; ſhell varied with a few white ſpots.

Vitrea. Shell hyaline with an acute margin, very ſlender rays, and concentric ſcaly curves. It is found in the North ſeas, among fuci and zoophytes; ſize of a pea; ſhell ſmooth, brittle, white, or varied with white and red; one ear emarginate and ſpinous.

Tranquebaria. Shell with 20 rounded rays, the interſtices very finely wrinkled; margin repand. It inhabits Tranquebar; ſometimes of one colour, which is moſtly orange, ſometimes varied with undulate brown, red, or cinereous ſpots; upper valve more convex.

Sauciata. Shell white, with purple ſpots and numerous unequal rays; the margin crenate. Found in the Red ſea.

Crenulata. Shell oblong, with undulate rays and ſtriæ,

ſtriæ, and tranſverſe interrupted bands; margin crenulate. This is a very ſmall ſpecies.

Innominata. Shell roundiſh, ſpotted, with deep grooves very finely ſtriate tranſverſely; margin crenulate. One of the ears hardly viſible.

Rufescens. Shell roundiſh, pale ruſous, with 24 rays; the ears with decuſſate ſtriæ. This ſpecies is of a middle ſize.

Squamata. Shell roundiſh, with thick rays furniſhed with diſtant parallel ſcales, and prickly at the ſides. The ſhell is convex and ſpotted; the margin crenate.

Anonyma. Shell rather oblong, with narrow ſcaly rays, the interſtices broader and ſtriate perpendicularly; ears with perpendicular wrinkles. The ſhell is varied with angular lines and ſpots.

Decemradiata. Shell flattened, with ten ſmooth flat uncqual rays; ears tranſverſely ſtriate.

Tenuis. Shell thin, with depreſſed ſcaly rays; ears ſhort. It is found in India and the North ſeas. The ſhell is bay, or cinereous ſpotted with black, ſometimes white or carmine, or pale orange.

Valentii. Shell with 20 rays, and tranſverſe ſemilunar bands. It is found in India. The ſhell is red; it reſembles the O. maxima, but the ears are unequal.

Media. Shell ſomewhat oblong, with crowded rays. Shell middle-ſized, reddiſh, ſaffron or piceous.

Crocea. Shell ſaffron, with muricate ſcaly rays alternately leſs.

Florida. Shell roundiſh, white, with roſy ſpots.

Ochroleuca. Shell oblong, ochraceous, with rays ſmooth on one part and granulate on the other.

Mustelina. Shell pale tawny, with yellow ſpots and bands and ſmooth rays; ears tranſverſely ſtriate. The ſhell is $2\frac{1}{4}$ inches long, and about as much broad.

Flammea. Shell ſaffron, rather oblong, with very fine perpendicular ſtriæ.

Incarnata. Shell rather oblong, fleſh-colour, with interrupted red bands and flattened rays. This is ſmall.

Guttata. Shell yellowiſh, rounded, dotted with red, with rays unequally converging at the hinge. It is ſmall.

Depressa. Shell ochraceous, with flat bifid rays. The ſhell is about an inch long, and ſomething broader.

Regia. Shell roundiſh, deep red, with rounded rays. The ear of the lower valve deeply emarginate.

Palliata. Shell equivalve, with numerous ſmooth rays. It reſembles O. pallium, but is leſs rough, and has fewer rays; ſhell ſtraw-colour with purple undulate bands.

Seminuda. Shell orange, oblong, muricate, with ſcales as far as the middle; with 22 rays. The ſhell is $1\frac{3}{4}$ inch long, $1\frac{1}{4}$ broad; ears with very fine ſcales.

Modesta. Shell roundiſh, hoary, with browniſh, reddiſh, and blueiſh ſpots; ſpaces between the rays broad. The ſhell has two filiform bands at the hinge.

Principalis. Shell purple, with a brown margin; the rays ſcaly from the middle and ſmooth at the hinge.

Versicolor. Shell variegated, with pectinate ſmooth rays.

*c. Valves more gibbous on one ſide.*

Flavicans. Shell nearly equivalve, with eight ſtriate rays, the margin rounded on one ſide. It is found in the South ſeas. The ſhell is rather oblique, white varied with brown and red, within white; the rays yellow; one of the ears very ſhort.

Fasciata. Shell equivalve, with 20 rough rays, the interſtices ſtriate; ears equal, ſmall. Inhabits the American and Atlantic ſeas. The ſhell is white, pellucid, gaping each ſide, very finely ſtriate within; the margin crenate.

Fragilis. Shell equivalve, with 25 rays; margin very entire; ears acute. It inhabits the Nicobar iſlands; reſembles the laſt, but is flatter, and has more rays; ſhell thin, brittle, $1\frac{1}{4}$ inch long, and about half as broad.

Lima. Shell equivalve, with 22 imbricate ſcaly rays, rounded at one margin; ears obliterated. It is found in the Mediterranean, Indian, and Red ſeas. The ſhell three inches long, $2\frac{1}{2}$ broad; white and rather flat; the number of rays uncertain, the ſcales elevated and acute; ears wrinkled.

Glacialis. Shell equivalve, with 50 imbricate interrupted rays; ears equal, one of them unequally plaited. It is found in the American ocean; reſembles the laſt, but has more numerous rays; ſhell ſnowy with a crenate margin; another variety has the margin entire.

Hians. Shell whitiſh, thin, gaping each ſide and oblique, with obſolete undulate rays, and tranſverſe rounded ſemilunar ſtriæ. Inhabits Norway; $1\frac{1}{2}$ inch long, $\frac{3}{4}$ of an inch broad; ears very ſmall and acute; margin crenate, very entire within.

Excavata. Shell dirty-white, with longitudinal undulate ſtriæ, and a few tranſverſe rings, ſmooth within; one ear obſolete; margin very entire. It is found in Norway, but is rare; five inches long, $3\frac{1}{4}$ board.

B. *Rough and generally plaited on the outſide.* Oyſters.

Malleus. Shell equivalve, three-lobed, two of the lobes placed tranſverſely like the head of a hammer. This ſpecies is found in the deep parts of the Indian and South ſeas, and is very rare. Shell about ſix inches long and $4\frac{3}{4}$ broad; black with a dark blue caſt, gaping, formed like a croſs; the valves lamellate.

Valsella. Shell ſubpellucid, narrow, elongated, brittle, lamellate; one end rounded; within very ſmooth and gloſſy. It inhabits the Red ſea; $3\frac{1}{2}$ inches long, one broad. The ſhell is violet, tawny, or ferruginous, gaping at the hinge; rough on the outſide, and thinner at the rounded end.

Anatina. Shell pellucid, lamellate, and laterally incurved. It inhabits the Nicobar iſlands; about an inch broad, and including the curvature three inches long; its ſhape in ſome meaſure reſembles a duck when ſitting; ſhell thin, brittle, varied with white and violet.

Diluviana. Shell plaited on the outſide; the margin with erect acutangular teeth. This is found in a foſſile ſtate in the calcareous mountains of Sweden, about the ſize of a common oyſter; the margin with erect ſerratures, formed as it were of the imbricate lamellæ of the ſhell, and tranſverſely ſtriate; valves with pectinate plaits and acute wrinkles.

Folium. Shell ovate, obtuſely plaited at the ſides, paraſitical. It inhabits the Indian ocean, where it is frequently found adhering to Gorgonia; ſhell ſtraw-colour, pale tawny, or violet, within ſilvery; hinge with a triangular hollow; upper valve turgid on the back towards the middle, wrinkled each ſide and tranſverſely ribbed; lower valve leſs flatter and grooved in the middle.

Orbicularis. Shell orbicular, flat, with an entire crenate margin. Shell with a very obtuſe margin, about the ſize of the end joint of the thumb.

* Edulis, or the common oyſter. The ſhell of this well-known and highly eſteemed ſpecies is nearly orbicular and rugged, with undulate imbricate ſcales; one valve is flat and very entire. There are ſix varieties of this ſpecies, found in different parts of the European and Indian ſeas, affixed to rocks, or in large beds. The ſhell is of various ſizes, forms, and colours, within white, and often gloſſy like mother-of-pearl.

pearl. The old ſhells have frequently an ANOMIA (which ſee) fixed to them, and are ſometimes covered with ſerpulæ, lepades, ſertulariæ, and other marine productions. The oyſter is ſuppoſed by naturaliſts to be an hermaphrodite animal. The ſpawn which they caſt in May adheres to the rocks, and other ſubſtances at the bottom of the ſea, and the ſhell is ſaid to be formed in the ſpace of 24 hours. It was formerly thought to have no power of locomotion, but it is now aſcertained, by accurate obſervation, that it can move from place to place, and vary its habits according to circumſtances. Oyſters which are recently taken up from places that are left dry by the ſea open their ſhell, loſe their water, and die in a few days; but if kept in reſervoirs, in which they are left occaſionally by the ſea, expoſed to the rays of the ſun, to ſevere cold, or are diſturbed in their beds, acquire the habit of keeping the ſhell cloſe when they are uncovered with water, and exiſt without injury for a long time. Mud and ſea-weeds are extremely injurious to the propagation and increaſe of the oyſter. Other ſhell-fiſh, and cruſtaceous animals, as muſcles, ſcallops, ſtar-fiſh, and crabs, are their moſt deſtructive enemies.

Oyſters are of different colours in different places; in Spain they are found of a red and ruſſet colour; in Illyria they are brown, but the fiſh is black, and in the Red ſea of the colour of the rainbow. The green oyſter, which is eaten in Paris, is brought from Dieppe. The oyſters from Britanny have been long famous, but thoſe which are brought from Merennes in Saintonge, are in the higheſt eſtimation. In tropical regions, the common oyſter is found attached to trees; this aſſertion has been frequently ranked among groundleſs and fabulous traditions, but the fact is eaſily explained. In warm climates, where vegetation is very luxuriant, a great variety of plants, among which are large trees, grow on the ſhores at the very edge of the ſea; and particularly on thoſe places which are ſheltered from the agitation of the waves. In ſuch places as the heads of bays and harbours, great abundance of mangrove trees grow up from the bottom, where it is ſeveral feet deep, covered with water. It is generally on the mangrove tree that the oyſter is found in the Weſt Indies. Without the trouble of picking them from the trees, the branches growing under water, to which they are attached, are cut off, carried home in baſkets, and in this ſtate brought to table, where they are eaten raw or roaſted.

Britain has long been noted for its oyſters; and the ancient Romans, who were extremely fond of this fiſh, had their layers or ſtews for oyſters as we have at preſent. Sergius Orata was the inventor of them, as early as the time of Lucius Craſſus the orator. He did not, however, conſtruct them for the purpoſe of indulging his appetite, but for the ſake of the profit attached to them. This country ſtill retains its ſuperiority in oyſters over other countries. Moſt of our coaſts produce them naturally, and in ſuch places they are taken by DREDGING, (which ſee,) and are a conſiderable article of commerce, in the raw and pickled ſtate. Stews or layers of oyſters are formed in places which nature never allotted as habitations for them. Thoſe near Colcheſter have long been famous. The oyſters or ſpats are brought to convenient places, where they improve in taſte and ſize. See MILTON.

SEMIAURATA. Shell oval, ſlightly eared, ſmooth, with an oblique baſe. It inhabits the Mediterranean, is about 1½ inch long, and 1¼ broad; of a dirty olive, with a few undulate white lines; very thin; each valve convex and ending in a beak; hinge with five rounded hollows.

* STRIATA. Shell oval, with longitudinal filiform ridges; inſide green. It is found in European ſeas, and is about an inch in diameter. The ſhell is thick, ſtrong, nearly opaque, not membranous, as in the common oyſter, with numerous ſlender irregular ridges, divided towards the bottom; upper valve flattiſh, lower concave; hinge broad, deep, ſomewhat triangular and ſtriate tranſverſely. In many ſhells is a white radiate mark below the hinge, formed by the cartilage of the fiſh.

FORNICATA. Shell rough, oblong, linear, with divergent hinges, vaulted internally. It is found in the Red ſea. The ſhell is brittle, membranaceous, tawny, about as long as a finger, terminating at the hinge in an elongated acutangular beak.

SINENSIS. Shell rough, lamellate, unequal, and glabrous within; lower valve larger, concave, and ending in a beak, with ten obtuſe plaits. It is found on the Chineſe ſhores; four inches long, and a little narrowed; ſhell ruſſet-brown, within whitiſh towards the hinge.

SPONDILOIDEA. Shell equivalve, pellucid, flattened, oval, beaked, glabrous, with perpendicular, undulate, granulate ſtriæ on the upper valve; margin very ſharp. Inhabits India: three inches two lines long, two inches five lines broad; ſhell white, with a few tawny ſpots.

FORSKAHLII. Shell plaited, and terminating in a long incurved hollow beak; the middle ribs with imbricate ſpinous wrinkles; the other valve flat. It is found in the Red ſea. Two inches three lines long, and about an inch broad; the flat valve whitiſh, the other nearly violet.

PLICATULA. Shell with longitudinal wrinkled plaits; the lower valve a little leſs and flatter. It inhabits the American and Mediterranean ſeas. Varies very much in ſhape and ſize; but is generally cinereous, with a mixture of violet, ſometimes white, with red or blueiſh ſtreaks.

ROSTRATA. Shell oblong, rugged; the upper valve lamellate, with a denticulate margin, the other excavated and longitudinally grooved; beak prominent. It inhabits the Mediterranean; upper valve yellowiſh-green, the other violet, varied with white; within cretaceous or chalky-white.

VIRGINICA. Shell nearly equivalve, thick, rough, lamellous; one valve with a prominent beak. It is found in the American and Indian ocean; nine inches long and four broad; whitiſh or ochraceous, within gloſſy-white.

CORNUCOPIÆ. Upper valve flat, lower one hollow and ſtriate, rough with ſcales, wrinkles and plaits, and ending in an elongated beak. It is found in the Indian and African oceans.

PARASITICA. Shell thin; lower valve convex and thicker, the other flat. It inhabits the Indian and Atlantic ſeas, and fixes itſelf to the roots and ſtumps of trees growing cloſe to and hanging over the water, eſpecially the *Mangifera;* varies in form and ſize, but is often as large as the palm of the hand.

EXALBIBDA. Shell thin, the upper valve longer and more convex. This is found in the Adriatic, fixed to other ſhells, ſometimes alone, ſometimes ſeveral together; about one inch and a half long, but is variable as to ſhape and ſize; generally whitiſh, rarely yellow or violet.

CRISTATA. Shell rugged, with imbricate lamellæ; the margin with obtuſely plaited teeth; the beak of one valve produced. Shell an inch long, and ten lines broad, white, with a few black ſpots; hinge with a broad conic tooth in the middle.

SENEGALENSIS. Shell equivalve, roundiſh, ſmooth, flat. It inhabits the ſhores of Senegal, and adheres to rocks; about two inches in diameter; tawny, within whitiſh.

STELLATA. Shell thin, depreſſed, rough, unequal; the upper valve ribbed, the ribs with a few ſpines. It is found in Guinea ſometimes affixed to other bodies by the hinge; ſometimes

ſometimes round, ſometimes oblong; very thin, white, with red or blueiſh rays, ſpots, or marks.

Ovalis. Shell oval, very thin, and terminating in a ſhort acute lateral channelled beak; with obſolete, unequal, perpendicular ſtriæ. The ſhell is about an inch long, brittle, whitiſh, within gloſſy ſilver-white; lower valve exceeding the upper both in length and breadth.

Papyracea. Shell roundiſh, fnowy, very thin, pellucid; upper valve terminating in a ſhort acute beak. It is found firmly fixed with the Lepas tintinnabulum.

Annulata. Shell equivalve, orbicular, white, with concentric ſemicircles. It is found in the North ſeas.

Retusa. Shell equivalve, oblong, white, glabrous, ſtriate; with an umbo or knob remote from the hinge. This is alſo found in the North ſeas.

C. *Hinge with a perpendicular grooved line.*

Perna. Shell equivalve, obovate, unequal, rounder at one end.

Isognomum. Shell equivalve, with a larger lobe, nearly forming a right angle with the hinge. There are four varieties of this ſpecies. They are found in the Indian ocean and South ſeas; from five to ſix inches long, and about one inch and three quarters broad in the middle; ſhell black, with a violet mixture, and pearly within; lamellate, with an open beak; a very rare ſhell.

Ephippium. Shell equivalve, orbicular, compreſſed, membranaceous. Found in the Indian ocean and Cape of Good Hope; very rare. The ſhell is about five inches long, five and a half broad, blackiſh, furruginous or purpliſh, and pearly within; roundiſh, lamellate, with a very acute margin.

Picta. Shell equivalve, thin, pellucid, and pointed at the hinge, the other end dilated; margin very acute. It inhabits the Red ſea; is more than an inch broad, and above two long; yellowiſh-brown, with paler undulate rays.

Legumen. Shell flat, hoary, thin, pellucid, lamellate; hinge with an oblique line; the interſtices of the grooves black. This ſpecies inhabits the Nicobar iſlands; is four lines broad, and above two inches long; near the knob is a livid ſpot.

Alata. Shell flat, brittle, pellucid, and dilated towards the margin; hinge with an oblique line ending in a ſmall beak. It is found in America.

Mytiloides. Shell nearly equivalve, ovate, ventricoſe, ſtraight. It is found in a foſſile ſtate in Alſace.

Torta. Shell equivalve, intorted. This alſo is found foſſile in Alſace.

Pes-lutræ. Shell equivalve, ſmooth, wedge-ſhaped, with ſix obtuſe plaits. Shell varied with purpliſh and white, and marked with very fine longitudinal ſtriæ; the margin ſlightly ſcalloped.

OSTRICH, in *Ornithology*. See Struthio.

OSTRICONI, in *Geography*, a town of the iſland of Corſica, near a river of the ſame name, which runs into the ſea; 22 miles W.S.W. of Baſtia.

OSTRITZ, or Wotrow, a town of Upper Luſatia, on the Neiſſe; 7 miles S. of Gorlitz. N. lat. 51° 1′. E. long. 15° 1′.

OSTROCOL, a town of Pruſſia, in Natangen; 9 miles S.S.E. of Lick.

OSTROG, a town of Poland, in Volhynia, once the capital of a duchy, ceded to Poland in 1609; 38 miles N.N.W. of Conſtantinov.

OSTROGOTHIA. See Gothland.

OSTROGOTHS, or Eastern Goths, in *Ancient Hiſtory*, a denomination given to thoſe Goths, who, before they left Scandinavia, inhabited the more eaſtern parts near the Baltic, in contradiſtinction to the Weſtrogoths, or Weſtern Goths, who inhabited that part of Scandinavia which borders on Denmark. The name was afterwards appropriated to thoſe Goths who eſtabliſhed themſelves on the other ſide of the Danube, and thus they were diſtinguiſhed from thoſe who proceeded farther weſtward and into Pannonia. The emperor Marcian, about A.D. 453, granted to the Oſtrogoths the whole of Pannonia from Sirmium, now Scriniſh, in Sclavonia, to Vindobona, now Vienna, in Auſtria. They, as well as the other barbarians, acknowledged the authority of the Conſtantinopolitan emperor, and were ſubjects of the empire; but at the ſame time governed by their own princes, to whom the emperor agreed to pay an annual penſion, upon their promiſing to guard the frontiers of the empire, and ſerve, when wanted, in the Roman armies. Pannonia being granted to the Oſtrogoths, the three brothers, who had previouſly reigned jointly, agreed to divide that country between them, Valemir ſettling in the eaſtern part of it, Theodomir in the weſtern, and Videmir between the other two. They were ſcarcely eſtabliſhed in their new territories, when the ſons of Attila, purſuing them even into Pannonia, fell upon Valemir in the vicinity of Sirmium; but that prince, with a ſmall number of men, defeated them with great ſlaughter, and obliged them to take refuge in that part of Scythia, which bordered on the Danube. About eight years after, the Goths being engaged in a war with the Satagæ, one of Attila's ſons, availing himſelf of that opportunity, entered Pannonia at the head of a conſiderable army, having ravaged the country; but the Goths, leaving the Satagæ, marched with all their forces againſt the Huns, who received ſuch a repulſe in their onſet, that they ever after ſtood in awe of the Goths, and never offered to moleſt them.

In the year 455, the emperor Leo, refuſing, under various pretences, to pay the Oſtrogoths their uſual penſion, they entered Illyricum, and there committed dreadful ravages; but Anthemius, the ſon-in-law of the emperor Marcian, obliged them to retire with conſiderable loſs. At length Leo renewed with them ancient treaties, and reeſtabliſhed peace, upon the emperor's promiſing to pay the Goths their arrears, and for the future 300 pounds weight of gold annually. On the other hand, Valemir ſent to Conſtantinople, by way of hoſtage, the famous Theodoric, afterwards king of Italy, then only eight years old. Leo received him with reſpect, maintained him at his court for ten years, in a manner ſuitable to his rank, and had him inſtructed by the beſt maſters in every branch of polite literature. In the tenth year of Leo's reign a war broke out between the Goths in Pannonia and the Squiri, who had been permitted by Marcian to ſettle in Leſſer Scythia and Lower Mœſia. Leo took part with the Squiri, who were nevertheleſs utterly defeated. The Squiri obtaining aſſiſtance, renewed the war, and laid waſte the territories of the Goths to a great extent. The Goths, putting themſelves under the command of the two ſurviving brothers, Theodomir and Videmir, Valemir having been previouſly ſlain in battle, and engaging the enemy on the banks of the Danube, ſlew a great number, and obliged the reſt to retire beyond that river. Theodomir having gained great ſucceſs in this conteſt, received, on his return, his ſon Theodoric, whom Leo had ſent back with rich preſents, after having kept him as a hoſtage for ten years. Theodoric had immediately recourſe to arms, and ſlew the king of the Sarmatians. The Goths in Pannonia determined to make war on the empire. On this occaſion part of the Oſtrogoths joined the Viſigoths in Gaul, and aſſiſted them in the conqueſt of that country, and in the reduction of Spain, becoming one people with them.

Theodomir entered Illyricum, and with the co-operation of his ſon Theodoric reduced ſeveral cities. Soon after this event a peace was concluded between the Romans and the Goths. Upon the death of Theodomir, his ſon Theodoric ſucceeded him; and declared for the emperor Zeno againſt the uſurper Baſiliſcus. Zeno, however, abandoned him, and Theodoric ravaged Thrace and Macedon. Theodoric afterwards marched into Italy, and A.D. 489, put Odoacer, who had aſſumed the title of king of Italy, after having put Oreſtes to death and depoſed his ſon Auguſtulus, to flight in two ſucceſſive engagements. Circumſtances, however, proving unfavourable, Theodoric had recourſe to Alaric, king of the Viſigoths, who had ſettled in Gaul. As the Viſigoths and Oſtrogoths were originally the ſame nation, and the Viſigoths had received among them, about ſixteen years before, a great number of Oſtrogoths, they readily granted him the deſired ſupplies; and accordingly he proceeded to beſiege Odoacer in Ravenna; and at length reduced all Italy. Having put Odoacer to death, Theodoric was proclaimed by the Goths and acknowledged by the emperor Anaſtaſius, who had ſucceeded Zeno, king of Italy. (See the biographical article THEODORIC.) Thus the kingdom of the Oſtrogoths was eſtabliſhed in Italy.

OSTROGOZK, in *Geography*, a town of Ruſſia, in the government of Voronez; 40 miles S. of Voronez. N. lat. 51°. E. long. 38° 4′.

OSTROGZEK, a town of Poland, in Volhynia; 18 miles S.W. of Berdiczow.

OSTROKOLLA, a town of Pruſſia; 80 miles S.E. of Konigſberg.

OSTROLENKA, a town of the duchy of Warſaw; 48 miles N.E. of Warſaw.

OSTROMETKE, a town of Pruſſia, in the palatinate of Culm; 10 miles S. of Culm.

OSTROPOLE, a town of Poland, in Volhynia; 10 miles N.E. of Conſtantinov.

OSTROSINA, a town of Croatia; 12 miles S.E. of Carlſtadt.

OSTROV, a town of Ruſſia, in the government of Pſkov, on the river Velika. N. lat. 57° 20′. E. long. 28° 14′.

OSTROUCHOVSKAIA, a town of Ruſſia, in the country of the Coſſacks, on the Choper; 44 miles W.S.W. of Arkadinſkaia.

OSTROVITZ, a town of Croatia; 12 miles S. of Bihacs.

OSTROVIZZA, a town and fortreſs of Dalmatia, which was taken by Soliman, in 1520, and ſoon after reſtored to the Venetians; its fortifications are deſtroyed; 14 miles N. of Scardona.

OSTROVNOE, a lake of Ruſſia, in the government of Kolivan; 120 miles S. of Kolivan. N. lat. 52° 24′. E. long. 80° 24′.

OSTROVSKOI, a town of Ruſſia, in the government of Koſtrom; 48 miles E.N.E. of Vetluga.

OSTROW, a town of the duchy of Warſaw; 60 miles E.N.E. of Warſaw.—Alſo, a town of Poland, in Volhynia; 22 miles S. of Lucko.—Alſo, a town of Lithuania, in the palatinate of Novogrodek; 44 miles S. of Novogrodek.

OSTROWIEC, a town of Lithuania, in the palatinate of Wilna; three miles E. of Wilna.

OSTROZECK, a town of Poland, in Volhynia; 42 miles W.N.W. of Zytomiers.

OSTRYA, or OSTRYS, in *Botany*, ὄστρυς of Theophraſtus, is by ſome taken for the Lilac, *Syringa vulgaris*; but the deſcription of that ancient writer far better accords with the Hornbeam, *Carpinus Betulus*, which therefore is uſually taken for his ὄστρυς. The "thick fibres, folds, and ſerratures" of the leaf, are characteriſtic of the latter, not of the former. Linnæus retains the name as a ſpecific appellation for the Italian, or Hop, Hornbeam, (ſee CARPINUS, ſp. 4.) which is ſo remarkable for its white, inflated, hop-like fruit.

OSTRYNIA, in *Geography*, a town of Lithuania, in the palatinate of Wilna; 20 miles W.S.W. of Lidda.

OSTUALLA, a town of Norway; 50 miles N. of Frederickſtadt.

OSTUNI, a town of Naples, in the province of Otranto, the ſee of a biſhop, ſuffragan of Brindiſi, containing two churches and five monaſteries; 51 miles N.W. of Otranto. N. lat. 40° 59′. E. long. 17° 38′.

OSUNA, a town of Spain, in the province of Seville; 12 miles S.S.W. of Ecija.

OSUNPOUR, a town of Hindooſtan, in Bengal; 45 miles N.N.E. of Dacca. N. lat. 24° 25′. E. long. 90° 48′.

OSWALD, in *Biography*, king of Northumberland, was obliged, after the death of Ethelfrid, his father, to take refuge in Ireland, his uncle Edwin having taken poſſeſſion of the throne. In his retreat he became a Chriſtian, and returning to his own country, defeated Cerdowalla, or Cædwalla, king of the Britons, who loſt his life in the conteſt. This was the laſt vigorous effort which the Britons made againſt the Saxons. Oſwald re-united the two kingdoms of Northumberland, but was ſlain in battle againſt Penda, king of Mercia, A.D. 643. Oſwald is much celebrated for his ſanctity and charity by monkiſh hiſtorians; and they pretend that his reliques wrought miracles, particularly in the cure of a ſick horſe, which had approached the place of his interment. Hume.

OSWALD, ERASMUS, a learned German, profeſſor of the mathematics and of the Hebrew language, was born in the county of Merckenſtein, in Auſtria, in the year 1511. Having gone through a courſe of grammar learning, he ſtudied ſucceſſively at the univerſities of Ingoldſtat, Leipſic, and Baſil, and in the laſt named place he diſtinguiſhed himſelf by his proficiency in the mathematical ſciences and the Hebrew tongue, under the inſtructions of the celebrated Sebaſtian Munſter. From Baſil he went to Memmingen, in Swabia, on an invitation from the magiſtrates to become mathematical profeſſor in that city; and afterwards he went to Tubingen, and was elected profeſſor of Hebrew. In imitation of Sebaſtian Munſter, he did not confine his inſtructions to the Hebrew language only, but delivered a courſe of lectures in the mathematics. In 1552 he accepted of the united profeſſorſhips of mathematics and Hebrew at Friburg, which he held for more than twenty-ſeven years. He died in 1579, in the ſixty-ninth year of his age. He was author of "Commentaria in Theorias Planetarum;" "De primo mobili;" "Commentaria in Sphæram Joannis de Sacroboſco;" "In Almageſtum Ptolomæi Annotationes;" "Gentium Kalendarium;" "Oratio funebris de Obitu Sebaſtiani Munſterii," written in the Hebrew language. He likewiſe tranſlated the New Teſtament into Hebrew, an undertaking on which no perſon had ventured before his time. He was author of paraphraſes on ſeveral books of the bible, and other works.

OSWALD, in *Geography*, a ſmall iſland in the gulf of Florida, near the coaſt of Eaſt Florida. N. lat. 25° 48′. W. long. 80° 22′.

OSWALD, *St.*, a town of Auſtria; 5 miles N. of Roſbach.—Alſo, a town of the duchy of Stiria; 11 miles N.E. of Windiſch Gratz.—Alſo, a town of Auſtria; 8 miles S.W. of Neuſtatt.—Alſo, a town of the duchy of Stiria; 6 miles S. of

S. of Landſperg.—Alſo, a town of Auſtria ; 5 miles E. of Freyſtatt.—Alſo, a town of Upper Carniola ; 11 miles E. of Stein.

OSWANSIO, a town of Sweden, in Geſtricia ; 17 miles W.S.W. of Geffle.

OSWEGATCHIE, a river of North America, which runs a north-weſterly courſe from its ſource into St. Lawrence county, New York ; after ſome windings it purſues a weſterly courſe by the northern part of a lake of its name, the waters of which it receives, and then runs ſeven miles N.W. into the St. Lawrence. The lake of this name is about 18 miles long from S.W. to N.E., and ſends its waters north-weſtward into the river of its name. It is about ten miles N.E. of the Thouſand lakes, near the entrance into lake Ontario.

OSWEGATCHIES, an Indian tribe reſiding at Swagatchey, on the river St. Lawrence, in Canada. Thirty years ago they could furniſh about 100 warriors.

OSWEGO, a navigable river of New York, which conveys the waters of Oneida, and a number of ſmall lakes, into lake Ontario. It is more commonly called *Onondago*.—Alſo, a fortreſs on the eaſt ſide of the mouth of the above river, and S.E. ſide of lake Ontario. N. lat. 43° 20'. W. long. 75° 43'. It was taken by the Britiſh from the French in 1756, and confirmed to them by the peace of 1763. It was delivered up to the United States July 14, 1766. It is about 150 or 160 miles E. by N. of Niagara. N. lat. 44° 43'. W. long. 76° 50'.

Oswego *Creek*, *Great*, lies in the county of Lincoln, Upper Canada, and runs into the river Welland, above the Little Oſwego creek, near the N.W. part of the townſhip of Wainfleet.

Oswego *Tea*, in *Botany*. See Monarda.

OSWESTRY, in *Geography*, a borough, market-town, and pariſh, in the hundred of Oſweſtry, and county of Salop, England, is ſituated on the great road from London to Holyhead, at the diſtance of 18 miles from Shrewſbury, and 179½ from the metropolis. The town ſtands upon higher ground than any other in Shropſhire, and the country around is delightfully varied with hills, vales, wood, and water, and exhibits ſome very rich and pictureſque ſcenery. It is a borough by preſcription, and is governed by a mayor, recorder, high ſteward, town-clerk, murenger, coroner, and other inferior officers. The body corporate conſiſts of the mayor, twelve aldermen, and fifteen common councilmen, who elect the mayor, recorder, and murenger ; but the high ſteward and town-clerk are nominated by the lord of the manor, and the office of coroner is always held by the chief magiſtrate of the preceding year. The petty ſeſſions for the hundred are holden here, beſides the courts connected with the borough. Wedneſday and Saturday of every week are the market-days in this town, and there are ſix fairs annually. Here is an excellent free grammar-ſchool, of recent erection. The church is a very ſpacious building, with a plain, well proportioned tower at one end. Oſweſtry has been much improved within the laſt two years, in conſequence of an act obtained, in 1810, for widening, paving, and lighting the ſtreets, and of the ſpirit of building which has reſulted from that meaſure. According to the parliament returns of 1811, the houſes in the town were 788, and the inhabitants 3479, in number.

Oſweſtry is a town of great antiquity. The Saxons called it Maeſerfield, or Macerfelth, ſignifying the acornfield ; and the Britons Tre-eveſan-gludddiu in Urbern, Tre-Kadari, or the town of Great Oaks. Its preſent appellation, which is a corruption for Oſwaldſtre, was derived from the name of St. Oſwald, king of Northumberland, who was defeated and ſlain here by Penda, king of Mercia, one of the moſt cruel and bloody tyrants that ever diſgraced a throne. Subſequently, when the great Offa conſtructed the barrier ſtill known by his name, Oſweſtry ſtood between it and Watt's-dyke, which ran parallel to the former, at the diſtance of two miles. It was thus rendered a border-town, and hence was frequently the ſcene of conteſt, firſt between the Saxons and the Britons, and afterwards between the latter and the Normans. Henry II. lay here previous to his defeat by the Welſh on the Berwin mountains. In 1212 king John burnt both the town and caſtle, which were then in the poſſeſſion of the Fitz-Alans, and plundered a part of Wales, on account of the refuſal of Llewellin to join his ſtandard, in oppoſition to Lewis, the dauphin of France, who had been invited to England by the rebellious barons. Oſweſtry was likewiſe deſtroyed by the Welſh prince, called Llewellin the Great, in 1233. During this period it was encircled by a ſtrong wall, which had four gates fronting the four cardinal points. Some traces of the wall ſtill remain, but the gates were entirely demoliſhed about the year 1769. Of the caſtle, which ſtood on a high, artificial mount at the weſt ſide of the town, only a few fragments now exiſt. Theſe, however, are ſufficient to indicate its former prodigious ſtrength, and conſequent importance, as a place of defence.

South from Oſweſtry is ſituated the elegant manſion of Aſton-park, the property of W. Lloyd, eſq.; and near the village of Weſt-Felton, in this neighbourhood, is the villa of John F. M. Dovaſton, eſq. called "The Nurſery." This gentleman has, within theſe few months, publiſhed a volume of poems, which may juſtly entitle him to hold a high rank among the poets of the age. His father, though he never appeared as an author, was a man of ſingular genius, and has left a large collection of MSS on the ſubject of antiquities, now in the poſſeſſion of his ſon, together with a variety of philoſophical and muſical inſtruments conſtructed by his own hands, and upon new principles. About a quarter of a mile north-eaſt from Oſweſtry is an ancient fortification called Old-Fort, which the Welſh formerly denominated Llys-Ogran, or Caer-Ogran, that is, Ogran's palace, or ſtrong-hold. It conſiſts of three deep entrenchments, encircling a natural eminence, having a ſudden aſcent on all ſides. Beyond this ſtand the venerable ruins of Whittingham-caſtle, which was built more than a century before the conqueſt, and after that event became a baronial reſidence of the Montgomeries, the Peverells, and the Fitz-guarines. The ſituation of this caſtle is extremely pictureſque ; its caſtern walls being waſhed by a fine lake, ſhaded with large, old oaks, and having a ſmall iſlet in its centre, covered with tall Wych-elms and aſh-trees. Knockin-caſtle, about five miles from Oſweſtry, was built by lord L'Eſtrange, or Strange, and continued in the poſſeſſion of his family till the reign of Edward IV., when it paſſed into the family of the Stanlies, earls of Derby. The village here had formerly a weekly market, and fairs, and was a place of conſiderable importance. Chirk-caſtle, on the confines of Denbighſhire, ſtands on the ſcite of a more ancient fortreſs, called Caſtell-Crogen, which was demoliſhed in the reign of Edward I., and the preſent ſtructure erected in its ſtead, by Roger Mortimer. In the time of the civil wars between king Charles and his parliament, this caſtle was the property of ſir Thomas Middleton, the celebrated parliamentary general, whoſe deſcendants, by the female line, ſtill poſſeſs it. It is a ſquare building, ſtrengthened at the angles by maſſy baſtion-like towers, and having a court in the centre. A

picture gallery in this edifice contains a large collection of portraits. Beauties of England and Wales, vol. xiii. by J. Nightingale and R. Rylance, and vol. xvii. by J. Evans.

OSWIECZIN, a town of Poland, in the palatinate of Cracow, on the Viſtula; 32 miles W. of Cracow.

OSYMANDYAS, in *Biography*, an Egyptian king, and the firſt monarch who formed a library, cauſed a coloſſal ſtatue of himſelf to be erected, on which was this inſcription; "I am Oſymandyas, king of kings; whoever will diſpute this title with me, let him ſurpaſs my works." Moreri.

OSYRIS, in *Botany*, ὄσυρις of Dioſcorides, which he deſcribes as "a ſmall ſhrub, with numerous, dark, tough branches;" ſo that profeſſor Martyn's conjectural derivation of the name from ὄζος, *a branch*, is very probably juſt. Some take *Antirrhinum Linaria* for the true *Oſyris*.—Linn. Gen. 515. Schreb. 677. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 394. Juſſ. 75. Lamarck Illuſtr. t. 802. (Caſia; Tourn. t. 488.)—Claſs and order, *Dioecia Triandria*. Nat. Ord. *Calyciflorae*, Linn. *Elaeagni*, Juſſ.

Gen. Ch. Male, *Cal.* Perianth of one leaf, turbinate, in three equal, ovate, acute, ſpreading ſegments. *Cor.* none, except a three-fold, marginal, nectariferous gland. *Stam.* Filaments three, very ſhort, inſerted into the calyx; anthers roundiſh, ſmall. *Piſt.* an abortive rudiment.

Female, *Cal.* ſhaped like that of the male, ſuperior, permanent, very ſmall. *Cor.* none, as in the male. *Stam.* as in the male, but abortive. *Piſt.* Germen turbinate, inferior; ſtyle the length of the ſtamens; ſtigma in three deep ſpreading ſegments. *Peric.* Drupa globoſe, umbilicated, of one cell. *Seed.* Nut globoſe, filling the cavity of the pericarp.

Eſſ. Ch. Male, Calyx three-cleft. Corolla none.

Female, Calyx three-cleft. Corolla none. Stigma in three deep ſegments. Drupa umbilicated, of one cell. Nut globoſe.

1. O. *alba*. Poet's Caſia, or Gardrobe. Linn. Sp. Pl. 1450. Scop. Carn. v. 2. 260. (Caſia poetica monſpelienſium; Camer. Epit. 26. C. poetica Lobelii; Ger. em. 1293.)—Leaves linear-obovate. Flower-ſtalks axillary.—Native of the ſouth of Europe. It has been brought into our greenhouſes, but having nothing to recommend it, and ſcarcely ever flowering, is now hardly to be met with. The *ſtem* is ſhrubby, much branched, angular, hard and rigid, with the aſpect of ſome kind of broom. *Leaves* alternate, an inch long, obovate, very narrow, entire, ſmooth, evergreen, rather glaucous. *Flowers* ſmall, greeniſh, on ſhort, ſimple, axillary ſtalks. *Fruit* ſcarlet, the ſize of a currant.

Scopoli would unite under this genus the *Elaagnus* and *Hippophae* of Linnæus, to which he was led by theoretical principles, without regard to nature, or to genuine rules of ſyſtematic arrangement.

2. O. *japonica*. Japaneſe Oſyris. Thunb. Jap. 31. Murray in Linn. Syſt. Veg. ed. 14. 881.—Leaves ovate. Flower-ſtalks from the rib of the leaf. Native of mountains in Japan. *Stem* ſhrubby, ſix feet high, with ſmooth, flexible, round *branches*. *Leaves* alternate, abundant about the tops of the branches, ſtalked, ovate, pointed, with briſtly ſerratures, ribbed, ſmooth on both ſides, unequal, an inch long or more. *Flower-ſtalks* about eight, collected into an umbel, from the midrib of the leaf, a line in length. *Fruit* unknown, ſo that Thunberg was uncertain as to the genus; yet he did not conceive that he had materials ſufficient to eſtabliſh a new one. The ſerrated *leaves* are remarkable, conſidering the other characters, or one might ſuſpect this plant to be partly allied to the *Aſparagi*.

OSYRIS, in *Gardening*, contains a plant of the ſhrubby kind, of which the ſpecies cultivated is, the poet's caſia, (O. alba).

*Method of Culture*.—Theſe plants are increaſed, by ſowing the berries in autumn, as ſoon as ripe, in ſome gravelly, ſtony, or ſimilar ſituation, on the ſide of a riſing ground, either in the places where the plants are to remain, which is the moſt ſucceſsful, or in a nurſery-bed for tranſplanting. As the ſeeds often remain two years before they vegetate, the places ſhould be kept clear from weeds during that time, or till the plants appear. They afterwards require only to be freed from weeds.

They afford variety in beds, borders, or other places, by the beauty of their fruit.

OSZMIANA, Oscкmiana, or *Oſmiana*, in *Geography*, a town of Lithuania, in the palatinate of Wilna, the principal place of a diſtrict, where provincial diets and juſtice-courts are held; 28 miles S.E. of Wilna.

OTABALO, a juriſdiction of South America, in the province of Quito, connected on the S. with that of San Miguel de Ibarra. The lands are laid out in plantations, and produce great quantities of ſugar. The Indians in the villages, and alſo thoſe who are independent, manufacture great variety of cottons, *viz.* carpets, pavilions for beds, quilts in damaſk work, wholly of cotton, either white, blue, or variegated with different colours; all which are highly valued in the provinces of Quito and Peru, where they are diſpoſed of to great advantage. The wheat and barley are ſown here, like Indian corn, in little holes, a foot diſtant from each other, into each of which are dropped five or ſix grains; and they generally reap above a hundred-fold. This juriſdiction abounds with horſes and black cattle; and from the milk of the latter large quantities of cheeſe are made. The fertility of the country is very much promoted by a great number of rivulets. Its flocks of ſheep are alſo numerous, though they ſeem to be neglected by the inhabitants. The principal place in this juriſdiction is Otabalo, which is ſo large and populous, that it is ſaid to contain 18,000 or 20,000 perſons, and among theſe a conſiderable number of Spaniards; 30 miles N. of Quito. N. lat. 0° 15'. W. long. 77° 56'.

OTACOUSTIC, formed from ὠς ὠτος, *ear*, and ακουω, *I hear*, a term applied to inſtruments which aid or improve the ſenſe of hearing. See Acoustic.

OTAHA, in *Geography*, one of the Society iſlands, in the South Pacific ocean, ſituated two miles N. of Ulietea, and both incloſed within one reef of coral rocks, ſo that there is no paſſage for ſhipping between them. Otaha affords two very good harbours, one on the eaſt ſide, called "Ohamene," and the other on the W., called "Ohererua," which is pretty large, and affords good anchorage in 20 and 25 fathom, nor is there any want of freſh water. The land of Otaha, as well as that of Ulietea, is hilly, broken, and irregular, except on the ſea-noaſt; yet the hills appear green and pleaſant, and are in many places clothed with wood. This iſland was conquered by the king of Bolabola. S. lat. 16° 33'. W. long. 151° 20'.

OTAHEITE, called by Capt. Wallis *King George the Third's Iſland*, an iſland in the South Pacific ocean, about 30 leagues in circumference, ſuppoſed to have been firſt ſeen by Quiros, in the year 1606, and called by him "Sagittario." Capt. Wallis was the firſt Engliſhman who diſcovered it, in 1767, and he alſo examined and deſcribed it. For his account of it ſee Hawkeſworth's Voyages, vol. i. In 1768 it was viſited by Monſ. Bougainville, and again by Capt. Cook, in the years 1769, 1773, and 1774. From his account

count of it, as drawn up by Dr. Hawkeſworth, we ſhall extract the following particulars. Our celebrated navigator came to an anchor on the 13th of April, 1769, in Port-royal bay, called by the natives "Matavai." He and his companions were hoſpitably received by the natives, who brought them in their canoes cocoa-nuts, fruit reſembling apples, bread-fruit, and ſome ſmall fiſhes, in exchange for beads and other trifles. On the 24th, Mr. (ſir Joſeph) Banks and Dr. Solander examined the country for ſeveral miles along the ſhore to the eaſtward, which for about two miles was flat and fertile; and afterwards the hills ſtretched quite towards the water's edge, and a little farther ran out to the ſea, ſo that they were obliged to climb over them. Theſe hills, which were barren, continued for about three miles more, and then terminated in a large plain, which was full of good houſes, and of people who appeared to live in great affluence. Here was a river, much more conſiderable than that at the fort of the navigators, which iſſued from a deep and beautiful valley, and at ſome diſtance from the ſea it was 100 yards wide. About a mile beyond this river, the country became again barren, the rocks every where projecting into the ſea, ſo that they reſolved to return from this excurſion. Soon after the queen of the iſland, named "Oberea," was introduced to them. She ſeemed to be about 40 years of age, was tall, and of a large make; her ſkin was white, and her eyes were animated by an uncommon degree of intelligence and ſenſibility: ſhe appeared to have been handſome when young, but few memorials of her beauty now remained. On the 26th of June, Cook and Mr. Banks ſet out in the pinnace to make a circuit of the iſland, in order to ſketch out the coaſt and harbours. Taking their route to the eaſtward, they went on ſhore in a diſtrict called "Oahounue," governed by a young chief called Ahio. They then proceeded to the harbour, in which M. Bougainville lay, called "Ohidea." This harbour lay on the W. ſide of a great bay, under ſhelter of a ſmall iſland, called "Boourou," near which is another, called "Taawirrii." In their farther progreſs, they reached a low neck of land, or iſthmus, at the bottom of the bay, that divides the iſland into two peninſulas, each of which is a diſtrict or government wholly independent of the other. From Port-royal the coaſt trends E. by S. and E.S.E. 10 miles, then S. by E. and S. 11 miles to the iſthmus. In the firſt direction the ſhore is in general open to the ſea; but in the laſt it is covered by reefs of rocks, which form ſeveral good harbours with ſafe anchorage, and other conveniences. The adjacent country was a marſhy flat about two miles over, acroſs which the natives haul their canoes to the correſponding bay on the other ſide. They then prepared to continue their route for what their guide, "Tituboalo," called the other kingdom; he ſaid that the name of it was "Tiarrabou," or "Otaheite Ete," and that of the chief who governed it "Waheatua:" they alſo learnt that the name of the peninſula, where they had taken their ſtation, was "Opoureonu," or "Otaheite Nuz." After rowing a few miles, they landed in a diſtrict which was the dominion of a chief called "Maraitata," the burying-place of men. They then proceeded to the diſtrict which was immediately under the government of the principal chief, or king of the peninſula, "Waheatua." This diſtrict conſiſts of a large and fertile plain, watered by a river ſo wide, that they were obliged to ferry over it in a canoe. In this place no houſe appeared to be inhabited, but the ruins of many that had been very large were perceived. Proceeding along the ſhore, which forms a bay, called "Oaitipeha," they found the Chief ſitting near ſome pretty canoe awnings, under which it was ſuppoſed he and his attendants ſlept. Hence they paſſed through a country that appeared to be more cultivated than any that had been ſeen in any other part of the iſland. The houſes were neither large nor numerous, but the canoes, which were innumerable, were ſuperior, both in ſize and ſtructure, to any that had been ſeen before. At almoſt every point there was a ſepulchral building, and there were many of them alſo inland. But though this part of the country was fertile and cultivated, no bread-fruit was found; the trees were bare, and the inhabitants ſeemed to ſubſiſt upon nuts, reſembling chefnuts, and which they called "Ahee." As they proceeded they came abreaſt of a ſmall iſland called "Otooarette:" they next advanced round the S.E. point, part of which is not covered by any reef, but lies open to the ſea; and here the ſwell riſes directly from the ſhore. At the ſouthernmoſt part of the iſland the ſhore is again covered by a reef, which forms a good harbour, and the land about it is very fertile. In a long houſe at the S.E. end of the iſland, they ſaw what was altogether new to them: at one end of it, faſtened to a ſemicircular board, hung 15 human jaw-bones, which appeared to be freſh, and there was not one of them that wanted a ſingle tooth. Much as they were ſurpriſed, and anxious as they were in their inquiries concerning this circumſtance, they could obtain no information. Quitting this ſituation, they were piloted over the ſhoals by the chief "Mathiabo," who wiſhed to accompany them; and opened the bay on the N.W. ſide of the iſland, which anſwered to that on the S.E., ſo as at the iſthmus, or carrying place, almoſt to interſect the iſland, and when they had coaſted about two-thirds of it, they determined to go on ſhore for the night. Here they were hoſpitably received in the houſe of the chief of the diſtrict, whoſe name was "Wiverou." This place is ſituated on the N. ſide of "Tiarrabou," the S.E. peninſula, or diviſion of the iſland, and at the diſtance of about five miles S.E. from the iſthmus, having a large and commodious harbour, inferior to none in the iſland, about which the land is very rich in produce. Without much communication with this diviſion, they were every where received by the inhabitants in a very friendly manner: the whole diſtrict was fertile and populous, and apparently in a more flouriſhing ſtate than "Opourenou," though not above one-fourth part as large. The next diſtrict in which they landed was the laſt in "Tiarrabou," and governed by a chief, whoſe name was "Omoe." Leaving Omoe, they proceeded on their return, and ſoon reached Opoureonu, the N.W. peninſula. Here they ſaw a repoſitory for the dead, uncommonly decorated; the pavement was very neat, and upon it was raiſed a pyramid, about five feet high, entirely covered with the fruits of two plants, peculiar to this country. Near the pyramid was a ſmall image of ſtone, of very rude workmanſhip, and the firſt inſtance of carving in ſtone that had been ſeen among theſe people. It was covered by a ſhed, and ſeemed to be highly valued. They then paſſed through the only harbour on the S. ſide of Opoureonu, that is fit for ſhipping. It is ſituated about five miles to the weſtward of the iſthmus, between two ſmall iſlands that lie near the ſhore, and about a mile diſtant from each other, and affords good anchorage. Here they were not far from the diſtrict called "Paparra," which belonged to their friends Oamo and Oberea, where they propoſed to ſleep. Taking up their quarters at the houſe of Oberea, though ſhe was abſent, they determined to lodge there: the houſe was neat, though ſmall, and had at this time no inhabitant but her father, who received them kindly. Here they ſurveyed the "Morai" of Oamo and Oberea, which is an enormous pile, and the principal piece of Indian architecture in the iſland. (See MORAI.) Having paſſed the night, in perfect ſecurity and quiet, they

arrived

arrived before the next evening at "Atahourou," the reſidence of their friend "Tootahah," where they were well entertained. The next day, Saturday, July the 1ſt, they got back to their fort at Matavai, having found the circuit of the iſland, including both peninſulas, to be about 30 leagues. On the 3d of this month Mr. Banks, with ſome Indian guides, ſet out to trace the river up the valley from which it iſſues. For about ſix miles they met with houſes, not far from one another, on each ſide of the river, and the valley was every where about 400 yards wide. Having been refreſhed at the laſt houſe they met with, and having walked about ſix miles further, they paſſed under vaults formed by fragments of the rock, and ſoon after found the river banked by ſteep rocks, from which a caſcade, falling with great violence, formed a pool ſo deep, that the Indians ſaid they could not paſs it. The ſtones, which Mr. Banks examined, exhibited, like thoſe of Madeira, manifeſt tokens of having been burnt: traces of fire are alſo manifeſt in the very clay upon the hills; ſo that it may be preſumed, that this and the neighbouring iſlands, are either ſhattered remains of a continent, which ſome have ſuppoſed to be acceſſary to this part of the globe, to preſerve an equilibrium of its parts, which were left behind when the reſt ſunk by the mining of a ſubterraneous fire, ſo as to give a paſſage to the ſea near it; or were torn from rocks, which, from the creation of the world, had been the bed of the ſea, and thrown up in heaps, to a height which the waters never reach.

Among the natives who almoſt were conſtantly with our navigators, was "Tupia," who had been the firſt miniſter of Oberea, when ſhe was in the height of her power; he was alſo the chief "Takowa" or prieſt of the iſland, and conſequently well acquainted with the religion of the country, both as to its ceremonies and its principles. He had alſo great experience and knowledge in navigation, and was particularly acquainted with the number and ſituation of the neighbouring iſlands. He was therefore an inſtructive and uſeful companion; and expreſſed a deſire to accompany our navigators, with which they cheerfully complied. The beſt articles for traffic in this iſland were axes, hatchets, ſpikes, large nails, looking glaſſes, knives, and beads, for ſome of which every thing which the natives poſſeſs may be procured. They are indeed fond of fine linen cloth, both white and printed: but an ax worth half a crown will fetch more than a piece of cloth worth 20ſ.

Otaheite is ſurrounded by a reef of coral rocks, which forms ſeveral excellent bays and harbours, where there is room and depth of water for any number of the largeſt ſhips. Port-royal, or Matavai, which is not inferior to any, may be eaſily known by a very high mountain in the middle of the iſland, which bears due S. from Point Venus. The beſt anchoring is on the E. ſide of the bay, with 16 and 14 fathom upon an oozy bottom. The ſhore of the bay is a fine ſandy beach, behind which runs a river of freſh water, ſo that any number of ſhips may be ſupplied without incommoding each other.

The face of the country, except that part of it which borders upon the ſea, is very uneven; it riſes in ridges that run up into the middle of the iſland, and there form mountains, which may be ſeen at the diſtance of ſixty miles: between the foot of theſe ridges and the ſea is a border of low land, ſurrounding the whole iſland, except in a few places where the ridges riſe directly from the ſea: the border of low land is in different parts of different breadths, but no where more than a mile and a half. The ſoil, except on the very tops of the ridges, is extremely rich and fertile, watered by a great number of rivulets of excellent water, and covered with fruit-trees of various kinds. The low land that lies between the foot of the ridges and the ſea, and ſome of the vallies, are the only parts of the iſland that are inhabited, and here it is populous: the houſes do not form villages or towns, but are ranged along the whole border, at the diſtance of about fifty yards from each other, with little plantations of plantains, the tree which furniſhes them with cloth. The whole iſland, according to the beſt information, could furniſh 6780 fighting men, from which the number of inhabitants may eaſily be computed. The produce of this iſland is bread-fruit, cocoa-nuts, bananas of thirteen ſorts, plantains, ā fruit not unlike an apple, which, when ripe, is very pleaſant; ſweet potatoes, yams, cocoas, a kind of arum; a fruit known here by the name of jambu, and reckoned moſt delicious; ſugar-cane, which the inhabitants eat raw; a root of the ſaloop kind, which the inhabitants call pea; a plant called ethee, of which the root only is eaten; a fruit, that grows in a pod, like that of a large kidney bean, which, when it is roaſted, eats very much like a cheſnut, by the natives called ahee; a tree called wharra, called in the Eaſt Indies pandanes, which produces fruit ſomething like the pine apple; a ſhrub called nono; the morinda, which alſo produces fruit; a ſpecies of fern, of which the root is eaten, and ſometimes the leaves: and a plant called theve, of which the root alſo is eaten: but the fruits of the nono, the fern, and the theve, are eaten only by the inferior people, and in times of ſcarcity. All theſe, which ſerve the inhabitants for food, the earth produces ſpontaneouſly, or with little culture. They have no European fruit, garden-ſtuff, pulſe, or legumes, nor grain of any kind. Of tame animals, they have only hogs, dogs, and poultry; neither is there a wild animal in the iſland, except ducks, pigeons, parroquets, with a few other birds, and rats, there being no other quadruped, nor any ſerpent. But the ſea ſupplies them with great variety of moſt excellent fiſh, to eat which is their chief luxury, and to catch it their principal labour. As to the people, they are of the largeſt ſize of Europeans. The men are tall, ſtrong, well-limbed, and finely ſhaped. The women of the ſuperior rank are alſo, in general, above our middle ſtature, but thoſe of the inferior claſs are rather below it, and ſome of them are very ſmall. This defect in ſize probably proceeds from their early commerce with men, the only thing in which they differ from their ſuperiors, that could poſſibly affect their growth. Their natural complexion is that kind of clear olive or brunette, which many people in Europe prefer to the fineſt white and red. The ſkin is delicately ſmooth and ſoft; they have no tint in their cheeks, which we diſtinguiſh by the name of colour. The ſhape of the face is comely, the cheek bones are not high, neither are the eyes hollow, nor the brows prominent; the only feature that does not correſpond with our ideas of beauty is the noſe, which, in general, is ſomewhat flat: but their eyes, eſpecially thoſe of the women, are full of expreſſion, ſometimes ſparkling with fire, and ſometimes melting with ſoftneſs; their teeth are, almoſt without exception, moſt beautifully even and white, and their breath perfectly without taint. The hair is almoſt univerſally black, and rather coarſe. The men have beards, which they wear in many faſhions, always, however, plucking out great part of them, and keeping the reſt perfectly clean and neat. In their motions there is at once vigour and eaſe; their walk is graceful, their deportment liberal, and their behaviour to ſtrangers and to each other affable and courteous. In their diſpoſitions, alſo, they ſeemed to be brave, open, and candid, without either ſuſpicion or treachery, cruelty or revenge. They were, however, all thieves; and when that is allowed, they need not much fear a competition with the people of any other nation upon earth. The women

always cut their hair ſhort round their ears, and the men, except the fiſhers, who are almoſt continually in the water, ſuffer it to flow in large waves over their ſhoulders, or tie it up in a bunch on the top of their heads. They have a cuſtom alſo of anointing their heads, with what they call "monoe," an oil expreſſed from the cocoa-nut, in which ſome ſweet herbs or flowers have been infuſed: as the oil is generally rancid, the ſmell is at firſt very diſagreeable to an European, and as they live in a hot country, and have no ſuch thing as a comb, they are not able to keep their heads free from lice, which the children and common people ſometimes pick out and eat; a hateful cuſtom, wholly different from their manners in every other particular, for they are delicate and cleanly almoſt without example; and thoſe to whom captain Cook diſtributed combs, ſoon delivered themſelves from vermin, with a diligence which ſhewed that they were not more odious to us than to them. They have a cuſtom of ſtaining their bodies, nearly in the ſame manner as is practiſed in many other parts of the world, which they call "tattooing." They prick the ſkin, ſo as juſt not to fetch blood, with a ſmall inſtrument, ſomething in the form of a hoe; that part which anſwers to the blade is made of a bone or ſhell, ſcraped very thin, and is from a quarter of an inch to an inch and an half wide; the edge is cut into ſharp teeth or points, from the number of three to twenty, according to its ſize: when this is to be uſed, they dip the teeth into a mixture of a kind of lamp-black, formed of the ſmoke that riſes from an oily nut, which they burn inſtead of candles, and water: the teeth, thus prepared, are placed upon the ſkin, and the handle to which they are faſtened being ſtruck, by quick ſmart blows, with a ſtick fitted to the purpoſe, they pierce it, and at the ſame time carry into the puncture the black compoſition, which leaves an indelible ſtain. The operation is painful, and it is ſome days before the wounds are healed. It is performed upon the youth of both ſexes, when they are about twelve or fourteen years of age, on ſeveral parts of the body, and in various figures, according to the fancy of the parent, or perhaps the rank of the party. The women are generally marked with this ſtain, in the form of a Z, on every joint of their fingers and toes, and frequently round the outſide of their feet: the men are alſo marked with the ſame figure, and both men and women have ſquares, circles, and creſcents, and ill-deſigned repreſentations of men, birds, or dogs, and various other devices, impreſſed upon their legs and arms, ſome of which, we were told, had ſignifications, though we never could learn what they were. But the part on which theſe ornaments are laviſhed with the greateſt profuſion, is the breech: this, in both ſexes, is covered with a deep black; above which arches are drawn one over another as high as the ſhort ribs. Theſe arches are their pride, and are ſhewn both by men and women with a mixture of oſtentation and pleaſure. The face in general is left unmarked. Some old men had the greateſt part of their bodies covered with large patches of black deeply indented at the edges, like a rude imitation of flame; but our navigators were told, that they came from a low iſland called "Nooucora," and were not natives of Otaheite. Their clothing conſiſts of cloth or matting of different kinds. The cloth, which will not bear wetting, they wear in dry weather, and the matting when it rains; they are put on in many different ways, juſt as their fancy leads them; for in their garments nothing is cut into ſhapes, nor any two pieces ſewed together. The dreſs of the better ſort of women conſiſts of three or four pieces: one piece, about two yards wide, and eleven yards long, they wrap ſeveral times round their waiſt, ſo as to hang down like a petticoat, as low as the middle of the leg, and this they call "parou:" two or three other pieces, about two yards and a half long, and one wide, each having a hole cut in the middle, they place one upon another, and then putting the head through the holes, they bring the long ends down before and behind; the others remain open at the ſides, and give liberty to the arms: this, which they call the "tebuta," is gathered round the waiſt, and confined with a girdle or ſaſh, of thinner cloth, which is long enough to go many times round them, and exactly reſembles the garment worn by the inhabitants of Peru and Chili, which the Spaniards call "poncho." The dreſs of the men is the ſame, except that inſtead of ſuffering the cloth that is wound about the hips to hang down like a petticoat, they bring it between their legs, ſo as to have ſome reſemblance to breeches, and it is then called "maro." Upon their legs and feet they wear no covering, but they ſhade their faces from the ſun with little bonnets, either of matting or of cocoa-nut leaves, which they make occaſionally in a few minutes. This, however, is not all their head-dreſs; the women ſometimes wear little turbans, and ſometimes a dreſs which they value much more, and which, indeed, is much more becoming, called "tomou:" which conſiſts of human hair, plaited in threads, ſcarcely thicker than ſowing ſilk. Sir Joſeph Banks has pieces of it above a mile in length, without a knot. Their perſonal ornaments, beſides flowers, are few; both ſexes wear ear-rings, but they are placed only on one ſide: when our navigators came, they conſiſted of ſmall pieces of ſhell, ſtones, berries, red peas, or ſome ſmall pearls, three in a ſtring; but the beads brought by captain Cook very ſoon ſupplanted them all. The children go quite naked; the girls till they are three or four years old, and the boys till they are ſix or ſeven. The houſes, or rather dwellings of theſe people, are all built in the woods, between the ſea and the mountains, and no more ground is cleared for each houſe, than juſt ſufficient to prevent the dropping of the branches from rotting the thatch with which they are covered; from the houſe, therefore, the inhabitants ſtep immediately under the ſhade, which is the moſt delightful that can be imagined. It conſiſts of groves of bread-fruit and cocoa-nuts, without underwood, which are interſected, in all directions, by the paths that lead from one houſe to the other. The ground on which the houſe is built is an oblong ſquare, twenty-four feet long, and eleven wide; over this a roof is raiſed, upon three rows of pillars or poſts, parallel to each other, one on each ſide, and the other in the middle. The utmoſt height within is about nine feet, and the eaves on each ſide reach to within about three feet and a half of the ground: below this, and through the whole height at each end, it is open, no part of it being incloſed with a wall. The roof is thatched with palm-leaves, and the floor is covered, ſome inches deep, with ſoft hay; over this are laid mats, ſo that the whole is one cuſhion, upon which they ſit in the day, and ſleep in the night. In ſome houſes, however, there is one ſtool, which is wholly appropriated to the maſter of the family; beſides this, they have no furniture, except a few little blocks of wood, the upper ſide of which is hollowed into a curve, and which ſerve them for pillows. The houſe is, indeed, principally uſed as a dormitory; for, except it rains, they eat in the open air, under the ſhade of the next tree. The clothes that they wear in the day ſerve them for covering in the night; the floor is the common bed of the whole houſehold, and is not divided by any partition. The maſter of the houſe and his wife ſleep in the middle, next to them the married people, next to them the unmarried women, and next to them, at a little diſtance, the unmarried men; the

ſervants,

ſervants, or "toutous," as they are called, ſleep in the open air, except it rains, and in that caſe they come juſt within the ſhed. There are, however, houſes of another kind, belonging to the chiefs, in which there is ſome degree of privacy. Theſe are much ſmaller, and ſo conſtructed, as to be carried about from place to place, and ſet up occaſionally, like a tent; they are incloſed on the ſides with cocoa-nut leaves, but not ſo cloſe as to exclude the air, and the chief and his wife ſleep in them alone. There are houſes alſo of a much larger ſize, not built either for the accommodation of a ſingle chief, or a ſingle family; but as common receptacles for all the people of a diſtrict. Some of them are 200 feet long, thirty broad, and, under the ridge, twenty feet high; theſe are built and maintained at the common expence of the diſtrict, for the accommodation of which they are intended. Of the food eaten here the greater part is vegetable. Of the only animals, hogs, dogs and poultry, there are by no means plenty. When a chief kills a hog, it is almoſt equally divided among his dependants; and as they are very numerous, the ſhare of each individual at theſe feaſts, which are not frequent, muſt neceſſarily be ſmall. Dogs and fowl fall ſomewhat more frequently to the ſhare of the common people. Captain Cook could not much commend the flavour of their fowls, but thought a South Sea dog was little inferior to an Engliſh lamb; their excellence is probably owing to their being kept up, and fed wholly upon vegetables. The ſea affords them a great variety of fiſh. The ſmaller fiſh, when they catch any, are generally eaten raw, as we eat oyſters; and nothing that the ſea produces comes amiſs to them: they are fond of lobſters, crabs, and other ſhell-fiſh, which are found upon the coaſt; and they will eat not only ſea inſects, but what the ſeamen call blubbers, though ſome of them are ſo tough, that they are obliged to ſuffer them to become putrid before they can be chewed. Of their vegetables, the principal is the bread-fruit, to procure which coſts them no trouble or labour but climbing a tree: the tree which produces it does not, indeed, ſhoot up ſpontaneouſly; but if a man plant ten of them in his life-time, which he may do in about an hour, he will as completely fulfil his duty to his own and future generations, as the native of our leſs temperate climate can do by ploughing in the cold of winter, and reaping in the ſummer's heat, as often as theſe ſeaſons return; even if, after he has procured bread for his preſent houſehold, he ſhould convert a ſurplus into money, and lay it up for his children. It is true, indeed, that the bread-fruit is not always in ſeaſon; but cocoa-nuts, bananas, plantains, and a great variety of other fruits, ſupply the deficiency. Salt water is the univerſal ſauce, no meal being eaten without it: thoſe who live near the ſea have it fetched as it is wanted; thoſe who live at ſome diſtance keep it in large bamboos, which are ſet up in their houſes for uſe. For drink they have in general nothing but water, or the juice of the cocoa-nut; the art of producing liquors that intoxicate, by fermentation, being happily unknown to them: neither have they any narcotic which they chew, as the natives of ſome other countries do opium, beetle-root, and tobacco. The quantity of food which theſe people eat at a meal is prodigious; one man will devour two or three fiſhes as big as a perch, three bread-fruits, each bigger than two fiſts, fourteen or fifteen plantains or bananas, each of them ſix or ſeven inches long, and four or five round, and near a quart of the pounded bread-fruit, which is as ſubſtantial as the thickeſt unbaked cuſtard. The women not only abſtain from eating with the men, and of the ſame victuals, but even have their victuals ſeparately prepared by boys kept for that purpoſe, who depoſit it in a ſeparate ſhed, and attend them with it at their meals. After meals, and in the heat of the day, the middle-aged people of the better ſort generally ſleep: they are, indeed, extremely indolent, ſo that ſleeping and eating are almoſt their whole employment. Thoſe that are older are leſs drowſy; and the boys and girls are kept awake by the natural ſprightlineſs and activity of their age. Their amuſements are muſic, dancing, wreſtling, and ſhooting with the bow: they alſo ſometimes vie with each other in throwing a lance. Their only muſical inſtruments are flutes and drums; the flutes are made of a hollow bamboo, about a foot long, and have only two ſtops, and conſequently but four notes. The drum is made of a hollow block of wood, of a cylindrical form, ſolid at one end, and covered at the other with ſhark's ſkin: theſe they beat not with ſticks, but their hands; and they know how to tune two drums of different notes into concord. They have alſo an expedient to bring the flutes that play together into uniſon, which is to roll up a leaf ſo as to ſlip over the end of the ſhorteſt, like our ſliding tubes for teleſcopes, which they move up and down till the purpoſe is anſwered, of which they ſeem to judge by their ear with great nicety. To theſe inſtruments they ſing; their ſongs are often extempore; they call every two verſes or couplet a ſong, "palay:" they are generally, though not always, in rhime; and when pronounced by the natives, they might be diſcovered to be metre. Their candles are made of the kernels of a kind of oily nut, which they ſtick one over another upon a ſkewer that is thruſt through the middle of them; the upper one being lighted burns down to the ſecond, and ſo on to the third, &c. Among other diverſions, there is a dance, called "timorodee," which is performed by young girls, whenever eight or ten of them can be collected together, conſiſting of motions and geſtures beyond imagination wanton, in the practice of which they are brought up from their earlieſt childhood, accompanied by words, which, if it were poſſible, would more explicitly convey the ſame ideas. In theſe dances they keep time with an exactneſs which is ſcarcely excelled by the beſt performers upon the ſtages of Europe. But the practice which is allowed to the virgin, is prohibited to the married woman. The Otaheiteans are remarkable for cleanlineſs. Accordingly they waſh their whole bodies in running water three times every day. They alſo waſh not only their mouth, but their hands at their meals, almoſt between every morſel; and their clothes, as well as their perſons, are kept without ſpot or ſtain. Their principal manufacture is their cloth, which is of three kinds; and it is made of the bark of three different trees: the Chineſe paper-mulberry, the bread-fruit tree, and the tree which reſembles the wild fig-tree of the Weſt Indies. The colours with which they dye this cloth are principally red and yellow. The red is exceedingly beautiful, and of a brighter and more delicate colour than any we have in Europe. The red colour is produced by the mixture of the juices of two vegetables; neither of which ſeparately has the leaſt tendency to that hue, and is a ſpecies of fig called here "Matte," and the other the "Cordia Sebaſtina" or "Etou." Of the fig-tree the fruit is uſed, and of the "Cordia" the leaves. The yellow is made of the bark of the root of the "Morinda citrifolia," called "Nono," by ſcraping and infuſing it in water. The inhabitants of this iſland have alſo a method of dyeing yellow with the fruit of the "tamanu:" they have alſo a preparation with which they dye brown and black. Another conſiderable manufacture is matting of various kinds; ſome of which is finer and better in every reſpect than any we have in Europe: the coarſer ſort ſerves them to ſleep upon, and the finer to wear in wet weather. They are alſo very dextrous in making baſket and wicker-work; their baſkets are of a thouſand different patterns, many of them exceedingly

exceedingly neat; and the making of them is an art that every one practiſes, both men and women. The women make little bonnets of the cocoa-nut leaf, to ſhade their faces, at ſo ſmall an expence of time and trouble, that when the ſun is again low in the evening, they throw them away. Theſe bonnets, however, do not cover the head, but conſiſt only of a band that goes round it, and a ſhade that projects from the forehead. Of the bark of a tree, called "poerou," the "Hibiſcus tiliacus" of Linnæus, they make ropes and lines, from the thickneſs of an inch to the ſize of a ſmall packthread: with theſe they make nets for fiſhing: of the fibres of the cocoa-nut they make thread, for faſtening together the ſeveral parts of their canoes, and belts, either round or flat, twiſted or plaited; and of the bark of the "erowa," a kind of nettle, which grows in the mountains, and is, therefore, rather ſcarce, they make the beſt fiſhing-lines in the world: with theſe they hold the ſtrongeſt and moſt active fiſh, ſuch as bonetas and albicores, which would ſnap our ſtrongeſt ſilk lines in a minute, though they are twice as thick. They make alſo a kind of ſeine, of a coarſe broad graſs, the blades of which are like flags; theſe they twiſt and tie together in a looſe manner, till the net, which is about as wide as a large ſack, is from ſixty to eighty fathom long: this they haul in ſhoal ſmooth water, and its own weight keeps it ſo cloſe to the ground that ſcarcely a ſingle fiſh can eſcape. In every expedient, indeed, for taking fiſh, they are exceedingly ingenious; they make harpoons of cane, and point them with hard wood, which in their hands ſtrike fiſh more effectually than thoſe which are headed with iron can do in our's, ſetting aſide the advantage of our's being faſtened to a line, ſo that the fiſh is ſecured if the hook takes place, though it does not mortally wound him. Of fiſh hooks they have two kinds, admirably adapted in their conſtruction as well to the purpoſe for which they are deſigned, as to the materials of which they are made. Theſe are made of mother-of-pearl, or ſome other hard ſhell. They have an adze of ſtone; a chiſſel, or gouge, of bone, generally that of a man's arm between the wriſt and elbow; a raſp of coral; and the ſkin of a ſting-ray, with coral ſand, as a file or poliſher. This is a complete catalogue of their tools, and with theſe they build houſes, conſtruct canoes, hew ſtone, and fell, cleave, carve, and poliſh timber. The canoes, or boats, which are uſed by the inhabitants of this and the neighbouring iſlands, may be divided into two general claſſes; one of which they call ivahahs, the other pahies. (See Boat.) In connection with their navigation we may mention their wonderful ſagacity in foretelling the weather, at leaſt the quarter from which the wind ſhall blow at any future time. In their longer voyages, they ſteer by the ſun in the day, and in the night by the ſtars; all which they diſtinguiſh ſeparately by names, and know in what part of the heavens they will appear in any of the months during which they are viſible in their horizon; they alſo know the time of their annual appearing and diſappearing with more preciſion than will eaſily be believed by an European aſtronomer. In ſpeaking of time, either paſt or future, they never uſed any term but "Malama," which ſignifies moon; of theſe moons they count 13, and then begin again, ſo that they have a notion of the ſolar year: each month, they ſay, has 29 days, including one in which the moon is not viſible. They diſtinguiſh them by ſeparate names. Every day is ſubdivided into twelve parts, each of two hours, of which ſix belong to the day and ſix to the night. In numeration they proceed from 1 to 10, the number of fingers on both hands; and though they have for each number a different name, they generally take hold of their fingers one by one, ſhifting from one hand to the other till they come to the number they want to expreſs. In counting from 10, they repeat the name of that number, and add the word *more;* ten and one more, is eleven, &c. When they come to 10 and 10 more, they have a new denomination, as we ſay a ſcore; and by theſe ſcores they count till they get ten of them, when they have a denomination for two hundred; but they did not ſeem to have any denomination for expreſſing a greater number. In ſpeaking of diſtance from place to place, they expreſs it, like the Aſiatics, by the time that is required to paſs it. Their language is ſoft and melodious; it abounds with vowels, and captain Cook's company eaſily learnt to pronounce it: but found it exceedingly difficult to teach them to pronounce a ſingle word of Engliſh; probably not only from its abounding in conſonants, but from ſome peculiarity in its ſtructure; for Spaniſh and Italian words, if ending in a vowel, they pronounced with great facility. Whether it is copious, our navigators were not ſufficiently acquainted with it to know; but it is certainly very imperfect, for it is almoſt totally without inflexion, both of nouns and verbs. Few of the nouns have more than one caſe, and few of the verbs more than one tenſe. They have, however, certain affixes, which, though but few in number, are very uſeful to them. At Otaheite they have few diſeaſes; the natives, however, are afflicted with the eryſipelas, and cutaneous eruptions of the ſcaly kind, very nearly approaching to a leproſy. Some few had ulcers on different parts of their bodies, of a virulent appearance. The method of cure that is chiefly practiſed by the prieſts of this iſland conſiſts chiefly of prayers and ceremonies. Their commerce with the inhabitants of Europe has already entailed upon them that dreadful curſe which avenged the inhumanities committed by the Spaniards in America, the venereal diſeaſe. There are two places in which their dead are depoſited; one a kind of ſhed where the fleſh is ſuffered to putrify; the other an incloſure, with erections of ſtone, where the bones are afterwards buried. The ſheds are called "Tapapow," and the incloſures "Morais." The Morais are alſo places of worſhip. As to their religion, they believe, beſides a ſupreme deity, that there are numerous ſubordinate deities, or "Eatuas," of both ſexes; the male are worſhipped by the men, and the female by the women; and each have morais to which the other ſex is not admitted, though they have alſo morais common to both: men perform the prieſtly office to both ſexes, and each ſex has its prieſts; for thoſe who officiate for one ſex do not officiate for the other. They alſo believe the immortality of the ſoul, at leaſt its exiſtence in a ſeparate ſtate, and that there are two ſituations of different degrees of happineſs, ſomewhat analogous to our heaven and hell: the ſuperior ſituation they call "tavirua l'erai," the other "liahoboo." They do not, however, conſider them as places of reward and puniſhment, but as receptacles for different claſſes; the firſt, for their chiefs and principal people; the other for thoſe of inferior rank; for they do not ſuppoſe that their actions here in the leaſt influence their future ſtate, or indeed that they come under the cognizance of their deities at all. The character of the prieſt, or "tahowa," is hereditary: the claſs is numerous, and conſiſts of all ranks of people; the chief, however, is generally the younger brother of a good family, and is reſpected in a degree next to their kings or emperors. Marriage, in this iſland, as appeared to us, is nothing more than an agreement between the man and woman, with which the prieſt has no concern. Where it is contracted, it appears to be pretty well kept, though ſometimes the parties ſeparate by mutual conſent, and in that caſe a divorce takes place with as little trouble as the marriage. Their morai, or place of worſhip, they approach with humility and reverence; and when the worſhipper brings his

offering to the altar, he always uncovers his body to the waiſt, and his looks and attitude are ſuch as expreſs a correſponding diſpoſition of mind. It did not appear that theſe people were guilty of idolatry; at leaſt they do not worſhip any thing that is the work of their hands, nor any viſible part of the creation. Although they cannot be ſaid to live under any regular form of government, yet a ſubordination is eſtabliſhed among them. Theſe orders correſpond to king, baron, vaſſal, and villain. Of the firſt order there are two in this iſland, one being the ſovereign of each of the peninſulas of which it conſiſts, and he is treated with great reſpect by all ranks. Thoſe of the next order are lords of one or more of the diſtricts into which each peninſula is divided, and of theſe there may be about 100 in the whole iſland. They parcel out their territories to thoſe of the next claſs, who cultivate, each his part, which he holds under the baron. Thoſe of the loweſt claſs reſemble the villains in feudal governments; they do all the laborious work, they cultivate the land under thoſe of the third claſs, they fetch wood and water, dreſs the victuals, and catch the fiſh. If a general attack happens to be made upon the iſland, every diſtrict under the command of the baron, or "Earee," is obliged to furniſh its proportion of ſoldiers for the common defence. The number furniſhed by all the diſtricts amounted to 6680. Upon ſuch occaſions the united force of the whole iſland is commanded in chief by the king, or "Earee rohie." Their weapons are ſlings, which they uſe with great dexterity, pikes headed with the ſtings of the ſting-rays, and clubs, of about ſix or ſeven feet long, made of a very hard heavy wood. Thus armed, they are ſaid to fight with great obſtinacy, and to give no quarter. Diſtributive juſtice, under ſuch a rude government, cannot be adminiſtered but very imperfectly; and indeed, conſidering the facility with which every appetite and paſſion are gratified, there can be little oppoſition of intereſt, and of courſe crimes are few. There is nothing like money, and this circumſtance excludes many crimes. Adultery, however, is ſometimes committed, as well as theft. Adultery, in the heat of reſentment, is ſometimes puniſhed with death, if the offending parties are caught in the act; but in ordinary circumſtances the female tranſgreſſor ſeldom ſuffers more than a beating. Puniſhment is enforced by no law, nor inflicted by the order of any magiſtrate. Though this, and the neighbouring iſlands lie within the tropic of Capricorn, yet the heat is not troubleſome, nor did the winds blow conſtantly from the eaſt. The tides about theſe iſlands are, perhaps, as inconſiderable as in any part of the world. A ſouth or ſouth-by-weſt moon, makes high water in the bay of Matavai, at Otaheite; but the water very ſeldom riſes perpendicularly above ten or twelve inches."

The variation of the compaſs is 4° 46′ E. On captain Cook's viſit to Otaheite in 1773, he was hoſpitably received; and before his departure, Capt. Furneaux took on board his ſhip a young man named Omai, a native of Ulietea, where he had ſome property, of which he had been diſpoſſeſſed by the people of Bolabola. Omai had a very good underſtanding, quick parts, and honeſt principles; his behaviour was ſuch as to render him acceptable to the beſt company, and his pride led him to avoid the ſociety of perſons of inferior rank. His paſſions were of the ſame kind with thoſe of other young men, but he had judgment to reſtrain the indulgence of them in an improper exceſs. During his ſtay in England he was introduced to his majeſty, for whom he entertained ſentiments of reſpect and gratitude; he was careſſed by many of the principal nobility, and did nothing to forfeit the eſteem of any one of them; but his principal patrons were the earl of Sandwich, ſir Joſeph Banks, and Dr. Solander. Although Omai lived in the midſt of amuſements during his reſidence in England, his return to his native country was always in his thoughts, and though he was not impatient to go, he expreſſed a ſatisfaction as the time of his return approached. He embarked with Capt. Cook in the Reſolution, when ſhe was fitted out for another voyage, loaded with preſents from his ſeveral friends, and full of gratitude for the kind reception he had experienced among us. On this viſit to Otaheite, it was found that though in the years 1767 and 1768, it ſwarmed with hogs and fowls, theſe animals were become ſcarce, and were procured with difficulty. The ſcarcity of hogs was attributed partly to the number which had been conſumed, and carried off by the ſhipping which had touched there of late years, and partly to the frequent wars between the two kingdoms.

Capt. Cook took pains to aſcertain whether, among the religious cuſtoms of the natives, human ſacrifices were not conſidered as neceſſary. He learnt upon the whole, that men for certain crimes were condemned to be ſacrificed to the gods, provided that they had not means by which to redeem themſelves. By Omai he was informed, that they offer human ſacrifices to the Supreme Being. From Cook's information we learn, that the women of Otaheite, and of the Society Iſles, have been calumniated by thoſe who repreſent them, without exception, as ready to grant the laſt favour to any man that will come up to their price. This, he ſays, is by no means the caſe; the favours of married women, and alſo of the unmarried of the better ſort, are obtained with as much difficulty here as in any other country; neither can the charge be underſtood indiſcriminately of the unmarried of the lower claſs, for many of theſe admit of no ſuch familiarities. There are, however, proſtitutes here as well as in other countries, and perhaps more in proportion. Upon a ſecond viſit to this iſland in May 1774, it was found that a very conſiderable number of canoes had been conſtructed in the courſe of eight months, and that hogs were ſo plentiful as to afford an ample ſupply. The number of war canoes raiſed and equipped by the whole iſland, amounts to 1720, manned by 68,000 able men, allowing 40 to each canoe, and as theſe cannot amount to above one-third part of the number of both ſexes, children included, the whole iſland cannot contain leſs than 204,000 inhabitants. If this number be not over-rated, we may infer from it the richneſs and fertility of the iſland, not 40 leagues in circuit, which enable it to ſupport ſuch a number of inhabitants.

The iſland of Otaheite made formerly but one kingdom; it is not known how long it has been divided. The kings of Tiarrabou are a branch of the family of thoſe of Opoureonu; at preſent the two are nearly related, and Capt. Cook thinks, that the former is, in ſome meaſure, dependent on the latter. Otoo, who was king in 1774, is ſtyled "Euree de hia" of the whole iſland, and our navigators were informed, that Waheatoua, the king of Tiarrabou, muſt uncover before him, in the ſame manner as the meaneſt of his ſubjects. Thoſe men who are the principal perſons about the king, and form his court, are generally, if not always, his relations. But though the eſtabliſhment be kingly, there was very little about Otoo, or his court, by which a ſtranger could diſtinguiſh the king from the ſubject. In his dreſs there is no pomp; and he ſubmits to the labour of paddling his canoe in common with others that are employed for this purpoſe. All have free acceſs to him, and converſe with him without ceremony; and it is obſerved, that the chiefs of the iſland are more loved than feared, and hence it may be concluded, that the government is mild and equitable.

It

It is a circumſtance, which we ſhall here mention, that the people of Otaheite are extremely fond of red feathers, eſteeming them no leſs valuable than jewels are regarded in Europe; and by a certain arrangement of them, they are uſed as ſymbols of the "Eatuas," or divinities, in all their religious ceremonies.

In Auguſt 1777, Capt. Cook again viſited Otaheite, and took Omai with him. But his conduct was ſo imprudent, that he ſoon forfeited the friendſhip of Otoo, and of every other perſon of note in the iſland. He aſſociated with none but vagabonds and ſtrangers, whoſe ſole views were to plunder him; and thus incurred the ill-will of the principal chiefs. The captain and his companions had not been forty-eight hours at anchor in Matavai bay, before they were viſited by all their old friends, none of whom came empty-handed; ſo that they were ſuperabundantly ſtocked with proviſions; nor were they under any apprehenſions of exhauſting the iſland, which preſented to their notice every mark of the moſt exuberant plenty. This viſit to the iſland afforded an opportunity of aſcertaining whether the offering of human ſacrifices conſtituted a part of the religious inſtitutions of this iſland. With this view, Capt. Cook attended Otoo to a morai at one of their public ſolemnities. He has particularly deſcribed the manner in which they were conducted. The unhappy victim, offered to the object of their worſhip on this occaſion, was a middle-aged man, who was one of the loweſt claſs of the people, and he had been ſelected, not on account of any particular crime, committed by him, meriting death. In general, however, ſuch guilty perſons are choſen for their ſacrifices; or elſe, common low fellows, who ſtroll about from place to place, and from iſland to iſland, without having any fixed abode, or any viſible way of getting an honeſt livelihood. This perſon appeared to have been privately knocked on the head with a ſtone. Thoſe who are devoted to ſuffer, in order to perform this bloody act of worſhip, are never appriſed of their fate, till the blow is given that terminates their exiſtence. Whenever any one of the great chiefs thinks a human ſacrifice neceſſary on any particular emergency, he pitches upon the victim. Some of his truſty ſervants are then ſent, who fall upon him ſuddenly, and put him to death with a club, or by ſtoning him. The king is next acquainted with it, whoſe preſence at the ſolemnities that follow is abſolutely neceſſary. The ſolemnity itſelf is called "Poore Eree," or chief's prayer; and the victim, who is offered up, "Taata-taboo," or conſecrated man. The morai, which is a place of worſhip, ſacrifice, and burial, where the ſacrifice was now offered, is that where the ſupreme chief of the whole iſland is always buried, and is appropriated to his family and ſome of the principal people; it differs little from the common ones, except in extent. Its principal part is a large, oblong pile of ſtones, lying looſely upon each other, about twelve or fourteen feet high, contracted towards the top, with a ſquare area on each ſide, looſely paved with pebble ſtones, under which the bones of the chiefs are buried. At a little diſtance from the end neareſt the ſea is the place where the ſacrifices are offered, which, for a conſiderable extent, is alſo looſely paved. Here is a very large ſcaffold, on which the offerings of fruits and other vegetables are laid. But the animals are depoſited on a ſmaller one, and the human ſacrifices are buried under different parts of the pavement. There are ſeveral other relics which ignorant ſuperſtition has ſcattered about this place. But one place, more particular than the reſt, is a heap of ſtones, at the end of the large ſcaffold, before which the human ſacrifice was offered; and on a kind of platform at one ſide are laid the ſkulls of all the human ſacrifices, which are taken up after they have been ſeveral months under ground. It cannot leſs than be regretted, that a practice ſo horrid, and ſuch bloody rites of worſhip ſhould prevail, as is probably the caſe, through all the widely extended iſlands of the Pacific ocean. There is reaſon alſo for believing, that there was a time when theſe deluded people were cannibals. Human ſacrifices are not the only barbarous cuſtom that is ſtill prevalent among this benevolent, humane people. For, beſides cutting out the jaw-bones of their enemies ſlain in battle, which they carry about as trophies, they, in ſome meaſure, offer their bodies as a ſacrifice to the "Eatooa." Soon after a battle in which they have been victors, they collect all the dead that have fallen into their hands, and bring them to the morai, where, with much ceremony, they dig a hole, and bury them all in it, as ſo many offerings to the gods; but their ſkulls are never after taken up.

Having ſettled Omai in the iſland of Huaheine, and having provided a comfortable habitation with ſuitable accommodations for him, our navigators took their leave of him on the 2d of November 1777; but in parting with Capt. Cook his feelings were much agitated, and he wept all the time in going aſhore. Whatever faults, ſays Capt. Cook, belonged to Omai's character, they were more than overbalanced by his great good-nature and docile diſpoſition. Otaheite lies in S. lat. 17° 30′ to 17° 48′. W. long. 149° 15′ to 150′. Matavai point lies in S. lat. 17° 29¼′. E. long. 210° 22′ 28″. Variation of the compaſs 5° 34′ E. Dip of the needle 29° 12′. Mr. Anderſon has furniſhed ſeveral particulars of information with regard to Otaheite, which form a diſtinct chapter in the ſecond volume of Cook's third voyage. Extended as this article is, we ſhall here ſelect a few of them. There is, he ſays, ſcarcely a ſpot in the univerſe, that affords a more luxuriant proſpect than the S.E. part of Otaheite. The hills are high and ſteep, and in many places craggy. But they are covered to the very ſummits with trees and ſhrubs, ſo that the obſerver would almoſt imagine, that the rocks had the property of producing and ſupporting their verdant clothing. The flat land that bounds theſe hills towards the ſea, and the interjacent vallies, teem with various productions which grow with the moſt exuberant vigour. Nature has been no leſs liberal in diſtributing rivulets, which are found in every valley, and which, as they approach the ſea, divide into two or three branches, fertilizing the flat lands through which they run. The habitations of the natives are ſcattered without order upon theſe flats, and many of them appearing toward the ſhore, preſent a delightful ſcene to the ſhips in the harbour. It is owing to the fertility of the country, combined with the mildneſs and ſerenity of the climate, that the natives are ſo careleſs in their cultivation, ſo that in many places the ſmalleſt traces of it cannot be obſerved. The cloth plant, which is raiſed by ſeeds brought from the mountains, and the "ava," or intoxicating pepper, which they defend from the ſun when very young, by covering them with leaves of the bread-fruit tree, are almoſt the only things to which they ſeem to pay any attention; and theſe they keep very clean. Notwithſtanding the fertility of the iſland, a famine frequently happens, in which, it is ſaid, many periſh. Of animal food little falls to the ſhare of the lower claſs of people; and then it is either fiſh, ſea-eggs, or other marine productions; for they ſeldom, or ever, eat pork. It is alſo among the better ſort that the "ava" is chiefly uſed. The women not only eat by themſelves, but are excluded from a ſhare in moſt of the better ſorts of food.

One of the greateſt natural curioſities of the country is a pond or lake of freſh water, at the top of one of the higheſt mountains, remarkable for its depth, and for its eels

of an enormous ſize. The language of Otaheite, though radically the ſame with that of New Zealand and the Friendly iſlands, is deſtitute of that guttural pronunciation, and of ſome conſonants, with which theſe latter dialects abound. Like the manners of the inhabitants, the language has thus become ſoft and ſoothing. It abounds with beautiful and figurative expreſſions, which would put it upon a level, if they were known and underſtood, with many of thoſe languages that are moſt eſteemed for their warm and bold images.

In forming connections with the females, they have cuſtoms that are deemed capricious and licentious. If a young man and woman, from mutual choice, cohabit, the man gives the father of the girl ſuch things as are neceſſary in common life, as hogs, cloth, or canoes, in proportion to the time they are together; and if he thinks he has not been ſufficiently paid for his daughter, he makes no ſcruple of forcing her to leave her friend, and to cohabit with another perſon, who may be more liberal. The man is always at liberty to make a new choice, but ſhould his conſort become pregnant, he may kill the child; and after that continue his connection with the mother, or leave her. It is thought no crime in the man to join a more youthful partner to his firſt wife, and to live with both. But the cuſtom of changing their connections is more common, and is ſpoken of with great indifference. The "Erreoes" are only thoſe of the better ſort, who from being able to purchaſe a ſucceſſion of freſh connections, are conſtantly roaming about and changing. So agreeable is this licentious plan of life to their diſpoſition, that the moſt beautiful of both ſexes thus ſpend their youthful days, habituated to the practice of enormities that would diſgrace the moſt ſavage tribes; but are peculiarly ſhocking amongſt a people, whoſe general character, in other reſpects, has evident traces of the prevalence of humane and tender feelings. When an "Erreoe" woman is delivered of a child, a piece of cloth, dipped in water, is applied to the mouth and noſe, which ſuffocates it. The women are frequently treated with harſhneſs and even brutality. Nothing is more common than to ſee the men beat them without mercy. Cutting or inciding the foreſkin (not circumciſion) is a practice adopted among them from a notion of cleanlineſs; and they alſo apply reproachful appellations to thoſe who do not obſerve that cuſtom.

As to their religious ſyſtem, it is extenſive and in many inſtances ſingular; but few of the common people are acquainted with it; the knowledge of it being confined to their prieſts. They do not ſeem to pay reſpect to one god, as poſſeſſing pre-eminence, but believe in a plurality of divinities, who are all very powerful. Their aſſiduity in ſerving their gods is very conſpicuous. Their prayers are very frequent, which they chant, much after the manner of the ſongs in their feſtive entertainments. The women, as in other caſes, are obliged to ſhew their inferiority in religious obſervances; for they are required to uncover themſelves in paſſing the morai; or take a conſiderable circuit in avoiding them. They are apprehenſive of the power of ſome inauſpicious being to hurt them. They ſay, that "Etee" is an evil ſpirit, who ſometimes does them miſchief; and to whom, as well as to their god, they make offerings. But the miſchiefs they apprehend from any ſuperior inviſible beings are confined to things merely temporal. Believing the ſoul to be both immaterial and immortal, they ſay, that it flutters about the lips during the pangs of death, and that then it aſcends, and mixes with, or as they expreſs it, is eaten by the deity. In this ſtate it remains for ſome time; and then departs to a certain place, deſtined for the reception of the ſouls of men, where it exiſts in eternal night, or, as they ſometimes ſay, in twilight, or dawn. They have no idea of any permanent puniſhment after death for crimes committed upon earth; for the ſouls of good and of bad men are eaten indiſcriminately by God. But they conſider this coalition with the deity as a kind of purification, neceſſary to be undergone, before they enter a ſtate of bliſs. For, according to their doctrine, if a man refrain from all connection with women ſome months before death, he paſſes immediately into his eternal manſion, without ſuch a previous union. Some of their notions about the deity are extravagantly abſurd; conceiving that he is ſubject to be deſtroyed by ſpirits to whom he has given exiſtence, and that afterwards he has the power of re-creating himſelf. They maintain, among other ſingularities, that not only all other animals, but trees, fruit, and even ſtones, have ſouls, which at death, on being conſumed or broken, aſcend to the divinity, with whom they firſt mix, and afterwards paſs into the manſion allotted for each. They believe that ſudden death, and all other accidents, are effected by the immediate action of ſome divinity. They have confidence in dreams, which they ſuppoſe to be communications either from their god, or from the ſpirits of their departed friends, enabling thoſe favoured with them to foretell future events; but this kind of knowledge is confined to particular people. Omai pretended to have this gift. They have traditions concerning the creation, which, as we may naturally imagine, are complex, and clouded with obſcurity. They have all many legends, both religious and hiſtorical.

The boundaries of the ſeveral diſtricts, into which Otaheite is divided, are, generally, either rivulets, or low hills, which in many places jet out into the ſea. But the ſubdiviſions into particular property are marked by large ſtones, which have remained from one generation to another. The removal of any of theſe gives riſe to quarrels, which are decided by arms; each party bringing his friends into the field. But if any one complain to the "Eree de hai," he terminates the difference amicably.

The number of inhabitants in both peninſulas of Otaheite is ſtated, in the "Miſſionary Voyage," to be about 50,000; and this eſtimate, though lower than that of captain Cook, is thought greatly to exceed the population. For other particulars reſpecting the diſpoſition and character, the manners and cuſtoms, the occupations and amuſements of the Otaheiteans, as they do not materially differ from thoſe of captain Cook and his aſſociates, we refer to the appendix of the Miſſionary Voyage, 4to. Lond. 1799.

OTAKOOTAIA, or WEENOOAETTE, ſignifying little iſland, an iſland of the South Pacific ocean, about three miles in circuit; diſcovered by captain Cook in the year 1777. The beach, within the reef, is compoſed of a white coral ſand; above which, the land within does not riſe above ſix or ſeven feet, and is covered with a light reddiſh ſoil; but is entirely deſtitute of water. The only common trees found there were cocoa-palms, of which there were ſeveral cluſters, and vaſt numbers of the "wharra." A ſort of bind-weed covers the vacant ſpaces; except in ſome places, where was found a conſiderable quantity of treacle-muſtard, a ſpecies of ſpurge, with a few other ſmall plants, and the "morinda citrifolia," the fruit of which is eaten by the natives of Otaheite in times of ſcarcity. The only bird ſeen among the trees was a beautiful cuckoo, of a cheſnut-brown, variegated with black. But upon the ſhore were ſome egg-birds, a ſmall ſort of curlew, blue and white herons, and great numbers of noddies. Here was found a lizard, of a moſt forbidding aſpect, though ſmall, running up a tree; and many of another ſort were ſeen.

The banks toward the ſea were frequented by an infinite number of a ſort of moth, elegantly ſpeckled with red, black, and white. There were alſo ſeveral other ſorts of moths, as well as ſome pretty butterflies, and a few other inſects. Although no fixed inhabitants were found on this iſland, indubitable marks remained of its being, at leaſt, occaſionally frequented. Some huts were found; and alſo ſeveral large ſtones, erected, like monuments, under the ſhade of ſome trees; and ſeveral ſpaces incloſed with ſmaller ones; where, probably, the dead had been buried; and, in one place, a great many cockle-ſhells of a particular ſort, finely grooved, and larger than the fiſt were to be ſeen; from which it was reaſonable to conjecture, that the iſland had been viſited by perſons who feed, partly, upon ſhell-fiſh; about three or four leagues from Wateeoo. S. lat. 19° 15′. E. long. 201° 37′. Cook's Third Voyage, vol. i.

OTALGIA, from ους, *the ear*, and αλγος, *pain*, a pain in the ear.

OTANGURA, in *Geography*, a town of Bengal; 16 miles S.S.W. of Tomar.

OTARDIS. See Bustard.

OTCHAKOV, in *Geography*, a town of Ruſſia, in the government of Ekaterinoſlav, at the mouth of the Dnieper, on the Black ſea. This town has been of conſiderable importance to the Turks, as a harbour for their gallies againſt the Corſairs; and being always fortified and garriſoned, it ſerved them to act againſt the Ruſſians. The colony of Mileſians, by whom it was founded, called it "Olbis." In 1737 it was beſieged by the Ruſſians under count Munich, who carried it by aſſault on the third day after opening the trenches. In the following year the Ruſſians evacuated it, after having demoliſhed the works. In 1789 it was again beſieged by the Ruſſians under prince Potemkin, and taken by ſtorm. On this occaſion, 6000 Turks were killed and 300 made priſoners; and the Ruſſians loſt about 4000 men. It was formerly a place of conſiderable trade, but ſince the eſtabliſhment of Odeſſa, its trade has declined: 40 miles W. of Cherſon. N. lat. 46° 44′. E. long. 31° 34′.

OTCHIER Bay, a bay on the N. coaſt of South America, W. of the river Urano and E. of cape Caldero; 10 miles W. of Cumana.

OTCHI-HOTUN, a town of Aſia; 150 miles N.E. of Caſhgar. N. lat. 40° 46′. E. long. 84° 14′.

OTEAVANOOA Harbour, a bay on the S.W. coaſt of the iſland of Bolabola. This is one of the moſt capacious harbours captain Cook ever met with.

OTENCHYTES, from ωτος, the genitive of ους, *the ear*, and εγχευω, *to pour in*, a ſyringe for the ear.

OTHER, in *Biography*, a celebrated Norwegian, who reſided ſome time at the court of Alfred the Great. He was a man of great conſideration in his own country, though his whole riches conſiſted of no more than twenty head of cattle, twenty ſheep, and as many ſwine, and being poſſeſſed of an enterpriſing ſpirit, he undertook a voyage of diſcovery towards the White ſea; and another towards Sweden, on the ſhores of the Baltic. Alfred, who had been at Rome, where he probably collected the materials for his Geography, having cauſed the Ormeſta or Hormeſta of Oroſius to be tranſlated into the Anglo-Saxon, introduced into it the relations of Other, and of Wulfſtan, a Dane, who, perhaps, became acquainted with Other in the courſe of his travels, or reſided with him in England. Alfred's account of the voyages of Other and Wulfſtan is ſaid to be exceedingly valuable, as containing the beſt information with regard to the geography of the northern regions in the ninth century. Gen. Biog.

OTHERA, in *Botany*, a genus of Thunberg's, very nearly allied to *Orixa*. Of its etymology we are unable to form a conjecture. Thunb. Nov. Gen. 56. Japon. 4. Willd. Sp. Pl. v. 1. 671. Juſſ. 288.—Claſs and order, *Tetrandria Monogynia*. Nat. Ord. *Berberides*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, permanent, cloven into four ovate ſegments. *Cor.* Petals four, ovate, blunt. *Stam.* Filaments four, inſerted at the very baſe of the petals, oppoſite to them, and about half their length; anthers twin, with four furrows. *Piſt.* Germen ſuperior, ſmooth; ſtyle none; ſtigma ſeſſile. *Peric.* unknown, probably a capſule.

Eſſ. Ch. Petals four, ovate, flat. Calyx four-cleft. Stigma ſeſſile. Capſule?

1. O. *japonica*. Linn. Syſt. Veg. ed. 14. 158. Thunb. Japon. 61.—Native of Japan, where it is called *Mukade Ko*, that is *Millepeda*. *Stem* ſhrubby, with round, ſtriated, purple *branches*. *Leaves* alternate, ſtalked, ovate, obtuſe, undivided, ſmooth, coriaceous, ſpreading. *Flowers* axillary, cluſtered, white.

OTHMAN, in *Biography*, the third Saracen caliph, was one of the companions and ſecretary of Mahomet. On the death of Omar, in the year 634, the choice of a ſucceſſor was left to ſix electors, who concurred in the nomination of Othman, after he had ſolemnly promiſed to govern according to the rules of the Koran. He was far advanced in life when he came to the throne, eſteemed for his piety and integrity, and diſtinguiſhed by the ſame ſimplicity of manners which had characteriſed his two predeceſſors. His firſt public act was to ſend a body of troops to complete the reduction of Hamadan, while another body entered Perſia, whence they totally expelled the unfortunate prince Yeſdejerd. The caliph ſhewed an unjuſtifiable partiality for his own relations, by appointing his foſter-brother Abdallah-ebn-Said to ſuperſede the renowned Amru in the government of Egypt, which he had conquered. This meaſure was as diſagreeable to the Arabians as to the Egyptians, and its conſequence was a revolt of the Alexandrians, who ſurrendered their city to the Greek emperor. Othman, thus made ſenſible of his fault, reſtored the government to Amru, who recovered Alexandria, though not without loſs and difficulty. Moawiyah, about the ſame time, took the iſle of Cyprus, and the important Syrian ſea-port of Aradus. The iſle of Rhodes afterwards fell under his power. Another Moſlem army reduced all that part of Khoraſan which had not then ſubmitted to the Mahometan yoke. From Upper Egypt Abdal'ah-ebn-Said made an incurſion into Nubia, the Chriſtian ſovereign of which country he reduced to beg for peace, on condition of becoming his tributary. While the Moſlem empire was thus extending on all ſides under the auſpices of Othman, the caliph himſelf was in danger of loſing the affection of his ſubjects, by the weakneſs of his meaſures. Several charges were exhibited againſt him, of which one was his laviſh donations to his favourites out of the public treaſury. Othman told the aſſembled people, that money in the treaſury was a ſacred depoſit, appropriated to the ſervice of God, and that he, as the ſucceſſor of the apoſtle of God, had a right to diſpoſe of it according to his own pleaſure. An aged companion of the prophet ventured to declare his diſapprobation of what he had heard; upon which he was ſo maltreated by the partizans of Othman, that he was left for dead. This cruel and unjuſt act ſo inflamed the paſſions of the people, that they inſiſted upon Othman's abdication. He again ſaw his error, and promiſed a redreſs of grievances; but his apparent

parent condeſcenſion only increaſed their violence. At length Ali, the ſon-in-law and nephew of Mahomet, who had a conſiderable party among the inſurgents, was induced to uſe his influence for the reſtoration of tranquillity, which was effected by his joining the caliph in a promiſe to remove the cauſes of complaint. Intrigues were, however, formed to depoſe him; and by the circulation of ſome wicked calumnies, Mahomet became again his enemy, and with his party inveſted the caliph's palace, denouncing vengeance againſt his perſon. Othman requeſted aid from Ali, who ſent his ſons, Haſſan and Hoſein, to defend the gates of the palace. This they faithfully performed for ſeveral days, till at length, either for want of water, or of a hearty inclination, they withdrew, and left the caliph to the mercy of his enemies. But mercy had fled from their hearts, and Othman, placing the Koran in his boſom, waited to receive his aſſaſſins. Mahomet ſeized him by the beard, and plunged his ſword into his breaſt. Others pierced his body in different parts, and he expired under multiplied wounds. For three days his corpſe lay unburied, and expoſed to the inſults of the multitude; and at length it was without ceremony thrown into a hole. This happened in the year 655, and in the twelfth year of the caliph's reign. He was a man of a majeſtic figure, and venerable aſpect, pure in his morals, but did not poſſeſs a mind at all adapted to the duties of his ſtation. Univer. Hiſt. Gibbon.

Othman, or Osman, the founder of the Ottoman dynaſty, was the ſon of Orthogrul, a Turkman or Oguzian chieftain, who had entered into the ſervice of Aladin, ſultan of Iconium, and had eſtabliſhed himſelf with his tribe at Surgut, on the banks of the Sangar. Aladin had made him lieutenant-general; and after the death of that ſultan, great diſſenſions aroſe among his officers, who at length agreed to join their forces, and make conqueſts on the Greek empire in Leſſer Aſia. When the diviſion of the conquered countries was made, Bithynia fell to the lot of Othman. On the 27th of July 1299, having forced the ſlightly guarded paſſes of mount Olympus, he firſt invaded the territory of Nicomedia; and "the ſingular accuracy of the date," ſays the hiſtorian, "ſeems to diſcloſe ſome foreſight of the rapid and deſtructive growth of the monſter. The annals of the twenty-ſeven years of his reign would exhibit a repetition of the ſame inroads; and his hereditary troops were multiplied in each campaign, by the acceſſion of captives and volunteers. Inſtead of retreating to the hills, he maintained the moſt uſeful and defenſible poſts, fortified the towns and caſtles, which he had firſt pillaged, and renounced the paſtoral life for the baths and palaces of his infant capital." In the courſe of many years of active ſervice, he made himſelf maſter of the whole of Bithynia; and though he was repulſed in his attempts upon Nicomedia and Pruſa, he awed thoſe cities by the conſtruction of ſtrong forts in their neighbourhood. At length his ſon Orchan gained poſſeſſion of Pruſa; but the welcome news of this important conqueſt did not arrive till Othman was almoſt inſenſible to glory, by the ſevere preſſure of old age and infirmities. He died in 1326, in the 69th year of his age, and 27th of his reign, reckoning from his invaſion of Bithynia. This was the commencement of the Turkiſh empire, which, from his name, has taken the appellation of the Ottoman Porte. The glory of Othman is chiefly founded on that of his deſcendants; but the Turks have tranſcribed or compoſed a royal teſtament of his laſt counſels of juſtice and moderation. Univer. Hiſt. Gibbon, vol. xi.

OTHO, M. Salvius, in *Biography*, a Roman emperor, was deſcended from a conſular family; and in the beginning of the reign of Nero, or about the year 55, he was diſtinguiſhed as a young man of graceful perſon but licentious manners, and even well fitted as a companion to the emperor in his debaucheries. While in poſſeſſion of imperial favour he contracted an acquaintance with the beautiful Poppæa Sabina, the wife of Rufus Criſpinus, which was followed by a divorce from her huſband and a marriage with her lover. Otho, from whatever motive, was continually extolling to the emperor, in the moſt rapturous terms, the happineſs which Poppæa afforded him. Nero, inflamed by theſe repreſentations, deſired that he might have an interview with the lady, who employed her charms ſo effectually, that he was entirely captivated. He carried her off from her huſband, and when Poppæa, to ſecure his affections by jealouſy, expreſſed a great fondneſs for Otho, that Nero forbid him his palace, and would probably have gone the length of putting him to death, had not Otho's friend, Seneca, ſuggeſted his appointment to the government of Luſitania, by way of an honourable exile. In this ſituation he conducted himſelf with great credit, acquired a new character, and was diſtinguiſhed for the uprightneſs and gravity of his adminiſtration. He had reſided ten years in his province, when, on the declaration of Galba againſt the tyranny of Nero A. D. 68, he was the firſt perſon in office who joined his party, probably with a view to the ſucceſſion of the empire by means of the adoption of Galba. When this emperor was ſeated on the throne ſuch a meaſure was propoſed to him by Vinius, whoſe daughter Otho was engaged to marry, but Galba was not of the ſame opinion, he preferred the mature and rigid virtue of Piſo as the ſubject he choſe to adopt. Otho reſented this determination, and he reſolved to make himſelf maſter of the treaſures of the empire, and having ſet his mind upon obtaining the ſovereign authority, he prepared the way for his elevation by the extraordinary attention which he paid to gain the affections of the ſoldiery, in which he ſucceeded beyond any man of his time. When his plans were matured, he fixed on two common ſoldiers to ſpread diſaffection through the legions quartered in Rome, and at a proper moment Otho appeared in a public place, and was ſaluted emperor by a ſmall party of the prætorians, conſiſting only of twenty-three. He was at firſt intimidated at the ſmallneſs of the number, and would have retreated, but the ſoldiers, placing him in a chair, carried him with ſwords drawn to the camp, where the whole body joined in the ſalutation. The revolt ſpread to the other troops, and Galba advancing to the forum, was abandoned by his friends and baſely murdered. (See Galba.) Otho was immediately recognized as lawful emperor by that very ſenate which had raiſed and ſupported Galba, and he began his reign in January A. D. 69. One of his firſt acts was to admit Marius Celſus, who had been the deſignated conſul under Galba, among his confidential friends. He ſacrificed to the public hatred Tigellinus, the hated miniſter of Nero; but on the memory of that bloody emperor he ſhewed a diſpoſition to confer honours. He felt himſelf in a ſituation of great danger, and was glad to cultivate popularity with all claſſes of the people, for a ſtorm appeared which threatened to ſubvert his throne. The legions quartered in Germany, which were always the ſtrength of the Roman armies, had thrown off their allegiance to Galba, and had declared Vitellius emperor, and ſuch was their impatience to give a maſter to the Roman world, that they had ſet out on their march for Rome before they received the news of the death of Galba. They were joined by the troops in Gaul; and ſeveral places in Italy declared for Vitellius, after his lieutenant Cæcina, at the head of the firſt diviſion, had croſſed the Alps. Rome was now in the greateſt conſternation at the proſpect of the approaching civil war.

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The two chiefs, Otho and Vitellius, reciprocally employed aſſaſſins to remove their rivals, but at the ſame time the family of Vitellius remained at Rome in ſafety, as a pledge for the ſecurity of that of Otho, ſhould fortune throw it in the power of the former. In the midſt of the alarms excited by this ſtate of affairs, a ſedition of the prætorians had nearly produced a terrible deſtruction at Rome. They ſeized upon their arms, murdered ſome of their officers, and conceiving that the ſenate was planning treaſon againſt their emperor, reſolved upon the extermination of the whole order. Otho was on that evening giving an entertainment to a numerous company of perſons of high diſtinction of both ſexes, who were ſtruck with the utmoſt terror, ſuſpecting that it might have been a plot contrived by the emperor for their deſtruction. He ſoon, however, convinced them that their fears did him injuſtice, and ſent them home by private ways, at the time that the ſoldiery were breaking into the palace. He had now to contrive means to appeaſe the inſurgents, which he did effectually by donatives well applied. Otho reſolved to meet the approaching danger, and quitting Rome at the head of his troops, he went to defend the paſſage of the Po. Every thing ſeemed to be unfavourable to the cauſe of Otho, though he himſelf is deſcribed by Tacitus, as having left all his luxurous indulgences behind him, and marching on foot, clad in ſteel, and covered with duſt. The chiefs of the ſenate were grown old and impotent; the rich men of Rome were indolent and ſlothful; the knights had long been diſſolved in eaſe and luxury, and the cohorts themſelves were relaxed from the military diſcipline of their anceſtors. Otho it is true was powerful, with regard to numbers; but his men, being little uſed to war, could not be relied upon. He ſeemed, by his behaviour, to be ſenſible of the diſproportion of the forces, and is ſaid to have been tortured with frightful dreams, and the moſt diſmal apprehenſions. With this temper he became impatient for an engagement, contrary to the opinion of his moſt prudent officers, who depended on ultimate ſucceſs chiefly from foreign armies attached to their party. They were, however, obliged to ſubmit to the emperor's determination, which was ſupported by his flatterers, by whom alſo he was perſuaded to the inglorious, and, as it proved, the prejudicial ſtep of retiring from the army with a part of the guards, before the commencement of the action. Between Cremona and Bebriacum the fatal battle was fought. The ſuperior diſcipline of the legions of Vitellius turned the ſcale of victory. Otho's army fled in the utmoſt confuſion to Bebriacum. Otho received the fatal news at Brixellum, whither he had retired, and his firſt thought was to deſtroy himſelf, as the only means of freeing himſelf from his cares, and his country from the dire calamities of a civil war. The ſoldiers flocked round him, beſeeching him to live, and to confide in their fidelity and valour for retrieving his affairs. They embraced his knees, kiſſed his hand, and gave every demonſtration of their adherence and attachment. A common ſoldier, ſeeing him immoveable, drew his ſword, and exclaiming, "From this Cæſar, judge of our fidelity, for there is not a man among us who would not do as much to ſerve you," plunged it into his own body, and fell dead at his feet. "No more ſuch brave men," cried Otho, "ſhall loſe their lives on my account." He accordingly mounted the tribunal, and made a moſt pathetic ſpeech to his ſoldiers, in which he gave reaſons for declining the conteſt. "I can never," ſaid he, "ſo much advance the intereſts of my country by war and blood, as by ſacrificing myſelf for its peace. Others have purchaſed real fame by good government, let it be my glory to leave an empire, rather than, by my ambition, to weaken or deſtroy it." He expreſſed the greateſt ſatisfaction and gratitude for the attachment he had met with, and then announced his final deciſion. He earneſtly exhorted all who adhered to him to ſubmit in time to the conqueror, that they might deſerve and obtain his clemency. He took meaſures to expedite their departure, and divided his jewels and money among his friends. Then retiring to a private chamber, he wrote conſolatory letters to his ſiſter, and to a lady whom he deſigned to marry. Hearing a tumult among the ſoldiers, he went out and quieted them, and returning to his chamber, he drank a draught of cold water, tried the points of two daggers, and placed the ſharpeſt under his pillow. He lay down in perfect tranquillity, and paſſed ſome hours in ſleep. At day-break Otho gave himſelf the mortal ſtroke, and expired in the arms of thoſe who entered on hearing his groans. The ſoldiers aſſembled at the mournful news, and with bitter lamentations carried his body to the funeral pyre. Several ſlew themſelves as a ſacrifice to his manes, and many in the neighbouring quarters, when they heard of the event, fell by mutual wounds. Otho died at the age of thirty-ſeven, after a reign of three months. There is ſomething in the concluſion of this prince's reign, that almoſt atones for the methods which he adopted to acquire dominion. The faults of his life were, in the general opinion, obliterated by the glory of his death.

Otho I., furnamed the *Great*, emperor of Germany, was the ſon of Henry, of the houſe of Saxony, and inherited from his father, the duchy of Saxony, Weſtphalia, Thuringia, and ſeveral other diſtricts on the Weſer and Elbe. After the death of Henry, in 936, Otho was elected emperor, and crowned at Aix-la-Chapelle in the following year. Juſt and upright in his adminiſtration, he ruled for a conſiderable time in tranquillity, till the diſturbances of thoſe unſettled times obliged him to draw the ſword. His arms were firſt directed againſt the Hungarians, who made an irruption into Franconia and Saxony, and laid waſte the country. Otho defeated them with great ſlaughter: he was next engaged in a long war with Boleſlaus, duke of Bohemia, whom he at length reduced to ſubmiſſion. After this Otho was called upon to interpoſe in a diſpute between Everhard, duke of Franconia, and Henry, duke of Brunſwick: he cauſed the former, with his principal adherents, to be tried, and condemned them to the ſingular puniſhment of each carrying a dog upon his ſhoulders from the place of his dwelling to Magdeburg. Henry, who was Otho's brother, afterwards made a league, with Everhard and the duke of Auſtriaſia, againſt the emperor, which brought on a battle, in which the latter was victorious. He was equally ſucceſsful on the other ſide of the Rhine, where he made himſelf maſter of Lorraine, and other diſtricts on the weſtern banks of the river, and laid the foundation of the palatinate of the Rhine. Lewis IV. of France married the ſiſter of Otho to ſtrengthen himſelf againſt his diſaffected ſubjects, an alliance, however, that did not prevent the emperor from entering France in 942, and expelling Lewis from Champagne. After this he took part with Lewis againſt Hugh the Great, father of Hugh Capet, and in conjunction with him took Rheims in 945. In 949, in conſequence of the maſſacre, by the Danes, of the Saxon colony ſettled in Sleſwick, Otho marched with an army into Jutland, where he had a battle with king Harold. The reſult was a treaty, by which the emperor was to keep a garriſon at Sleſwick, and Harold was to permit the Chriſtian religion to be preached in his dominions. In 955 the Hungarians entered Germany in vaſt numbers, and penetrating as far as Swabia, laid ſiege to Augſburg. Otho immediately aſſembled the force of the empire to oppoſe them, and after an obſtinate engagement defeated them with great ſlaughter. His reputation at this period procured him two diſtant embaſſies of friendſhip, one from Abderame, the

Mooriſh king of Cordova, the other from Helen, queen of the Ruſſians, who requeſted him to ſend miſſionaries in order to inſtruct her ſubjects in the doctrines of Chriſtianity. The oppreſſions of Berenger in Italy continuing, Otho ſent his ſon Ludolf to check his tyranny, who defeated him in ſeveral engagements, but was himſelf cut oſi by a premature death. Otho himſelf, ſolicited by the pope to come to the deliverance of the church, and promiſed the imperial crown as a recompence, in 960 marched into Italy at the head of a powerful army. Berenger did not wait for his approach; and at Milan he was crowned king of Italy. In the next ſpring he advanced to Rome, where he received the imperial crown from the hands of John XII., and from this era, according to Gibbon, "two maxims of public juriſprudence were introduced by force and ratified by time. 1. That the prince who was ſelected in the German diet, acquired from that inſtant the ſubject kingdoms of Italy and Rome: but 2. That he might not legally aſſume the titles of emperor and Auguſtus, till he had received the crown from the hands of the Roman pontiff." Otho beſtowed ſplendid gifts upon the church of St. Peter, and reſtored to the papal ſee the domains that had been wreſted from it, but at the ſame time he impoſed an oath upon the ſenate and people of Rome, that they would never elect a pope without his conſent. The pope, finding that he had procured a maſter in an ally, invited, as ſoon as Otho had withdrawn his army from Rome, Adelbert, the ſon of Berenger, and entered into a treaty with him for the expulſion of the Germans. The emperor thereupon convoked a council, which depoſed John, on the charge of his ſcandalous life, and elected a new pope under the name of Leo VIII. This pope, in gratitude for his elevation, confirmed to Otho and his ſucceſſors the prerogative granted to Charlemagne, of nominating popes and conferring inveſtiture on biſhops. On the death of John, which happened ſoon after, his adherents choſe Benedict V. in his ſtead. The emperor returning to Rome, depoſed him and replaced Leo on the throne, and then went back to Germany. On the death of Leo, John XIII. was choſen, in compliance with the recommendation of Otho, but the Romans ſoon after impriſoned him, and renounced their allegiance to the emperor. Upon this he recroſſed the Alps in 967, viſited Ravenna, and other Italian cities, and cauſed his ſon Otho to be crowned at Rome, as his partner in the empire. At Capua he received an embaſſy from the Greek emperor, Nicephoras Phocas, who propoſed a renewal of the alliance between the two empires, and requeſted his aid to expel the Saracens from Calabria. Otho gave a favourable reply to the embaſſadors, and made overtures of marriage between his ſon and Theophano, ſtep-daughter of the Greek emperor. The embaſſadors whom he ſent to Conſtantinople for the purpoſe of regulating the nuptials, were treacherouſly maſſacred, which violation of the laws of nations Otho revenged, by ſending an army to ravage the Greek poſſeſſions in Calabria. After the death of Nicephorus, an agreement was entered into with his ſucceſſor, John Zimices, and the marriage was conſummated. Not long after, in the enjoyment of peace and proſperity, this emperor died, of an apoplectic diſorder, in the year 972, after a long and active reign, during which he gave ſome extraordinary proofs of piety, courage, and generoſity, on account of which he juſtly acquired the epithet of Great. His conſort Alix retired into a convent immediately after his deceaſe; and his remains were interred, with due ſolemnity, in the cathedral church of Magdebourg, where his tomb is ſaid to be ſtill diſtinguiſhed by a Latin inſcription. Univer Hiſt. Gibbon.

Otho II., emperor of Germany, ſon of the preceding, ſucceeded his father to the imperial crown, though oppoſed by Henry, duke of Bavaria, who was proclaimed emperor at Ratiſbon, but who was ſoon obliged to renounce his title and alſo relinquiſh his duchy. Otho next found himſelf involved in a troubleſome war with Lotharius, king of France; at firſt he attempted to appeaſe the French king by ſome important conceſſions, but this proving unſucceſsful, he aſſembled an army of 60,000 men, made an irruption into the enemy's country, and committed ſuch dreadful ravages, that he quickly had peace on his own terms. In this expedition, however, he was expoſed to imminent danger by an inundation of the river Aiſne, which deſtroyed a conſiderable part of his army. After devoting ſome time to the arrangement of his affairs in Germany, he led a numerous body of forces into Italy, in order to puniſh a revolt of the Romans, and to recover Apulia and Calabria, which had been recently taken by the Greeks and Saracens. He accordingly entered Rome without oppoſition, and ſoon after hazarded a battle with the enemy, but his army was defeated, and he himſelf was reduced to the neceſſity of committing himſelf to the mercy of the waves in a ſolitary veſſel, having firſt ſtripped himſelf of his imperial robes. This ſhip was taken by corſairs, to whom he promiſed a large ſum for a ranſom, and while they were heſitating, he took the opportunity of throwing himſelf into the ſea and ſwimming aſhore at Roſani, where the empreſs then was. Soon after this event he renewed the war with vigour, and his exertions were attended with ſuch ſignal ſucceſs, that the Saracens in Italy were utterly exterminated. He then chaſtiſed the puſillanimous troops who had deſerted him in a former engagement; gave up the town of Beneventum to military execution, for having furniſhed his enemies with proviſions; and revenged himſelf for the defection of the Romans, by cauſing many of the principal citizens to be maſſacred at a banquet. This ſavage act obtained for him the title of the "Sanguinary." After this he marched into Lombardy, and held an aſſembly of the ſtates of Italy and Germany at Verona, in which he cauſed his young ſon Otho to be recognized as heir of the empire. He then returned to Rome, where he fell ill, and died in the year 983, having ſat upon the throne between ten and eleven years. His death has been differently accounted for; ſome ſay it was occaſioned by the wound of a poiſoned javelin, received in his war with the Greeks, and others aſſert that his death was haſtened by the imprudent behaviour of his empreſs Theophania, who had publicly exulted in the victories of her countrymen, though it was obtained over her huſband. His own opinion of the reliance to be placed on his Italian ſubjects, was ſhewn by a law, in which he forbade their evidence to be taken even on oath. Univer. Hiſt. Gibbon.

Otho III., emperor of Germany, ſon of the preceding, was twelve years of age when he ſucceeded to the throne, on which account he obtained the ſurname of the "Infant," but when this appellation was no longer applicable, he acquired the epithet of "Rufus." Henry, duke of Bavaria, nephew of Otho I., took poſſeſſion of the perſon of the young prince, under pretence of the right of guardianſhip, but a conſiderable number of the German princes aſſembling, delivered him from the duke's cuſtody, and cauſed him to be proclaimed emperor with the uſual ſolemnities. While the other parts of his dominions ſubmitted to his authority, the city of Rome ſhook off the German yoke in favour of Creſcentius, governor and titular conſul of that city. The commencement of this reign was diſturbed by hoſtile incurſions of the Danes and Sclavonians, but the imperial arms were at length decidedly victorious. About this time a furious conteſt began between Charles, duke of

of Lorrain, and Hugh Capet, which terminated in the captivity of the former, and the exaltation of his rival to the crown of France. In 996 he croſſed the Alps, reduced Milan, where he received the Lombard crown, and proceeding to Rome, filled the pontifical chair, which was become vacant, with a relation of his own, by the name of Gregory V., by whom, in return, he was crowned emperor. He pardoned Creſcentius, quieted the diſturbances at Capua and Benevento, and then reviſited the Lombard cities on his return to Germany. On his arrival at Modena, he gave a ſtriking proof of what was denominated, in thoſe days, a love of juſtice, upon the empreſs Mary, daughter of the king of Arragon, who, having been repulſed in her criminal advances to the count of that place falſely accuſed him of an attempt upon her honour. Otho, paying credit to the charge, had put the count to death, but his widow demanding juſtice, having proved the innocence of her huſband, Mary was ordered to be burnt alive, and the emperor devoted a large ſum of money to be paid for the benefit of the widow. Such is the ſtory of the time, which is entirely diſcredited by many of the beſt hiſtorians; and others, who ſeem to concur in admitting the general fact, repreſent the empreſs as having only been diſgraced, and her detection in ſome criminal act is, perhaps, not very improbable.

As ſoon as Otho had returned into Germany, and begun to make ſome neceſſary regulations, he received the vexatious intelligence that Creſcentius, having obtained the conſulſhip in Rome, had expelled pope Gregory, and filled his place with another, who had aſſumed the name of John XVI. The emperor inſtantly marched with all poſſible expedition into Italy, made himſelf maſter of Rome, and treated the two uſurpers with extraordinary ſeverity: for the anti-pope, after having been deprived of his eyes and his noſe, in the moſt cruel manner, was hurled from the top of the caſtle of St. Angelo; and Creſcentius, after being expoſed to public deriſion, and put to the torture, was hanged upon a very high tree, together with twelve of his adherents. He re-eſtabliſhed Gregory, and publiſhed a decree, declaring, that for the future the Germans alone ſhould have the privilege of electing a Roman emperor. In the year 1000, at the ſolicitation of the duke Boleſlaus, he erected Poland into a kingdom, to be held as a fief of the empire, on condition of homage. Shortly after this event, Otho was again called into Italy to repel an invaſion of the Saracens, and to cruſh a freſh revolt of the turbulent Romans. His exertions againſt the Saracens were attended with complete ſucceſs, but the Romans openly refuſed to ſubmit to his authority, and while he was aſſembling an army to revenge this inſult, he was poiſoned by a widow, whom he is ſaid to have ſeduced under a promiſe of marriage. He died at Palermo in 1002, in the thirtieth year of his age, and the eighteenth of his reign. In his laſt moments, he fixed upon Aix-la-Chapelle as the place of his ſepulture. Otho III. is reckoned to have had many great qualities, and he governed with vigour and ſucceſs. In common with his father and grandfather, he was very liberal to the church, and it is ſaid that two-thirds of the eccleſiaſtical benefices in Germany were granted by the firſt three Othos.

Otho IV., emperor of Germany, was duke of Saxony, of the houſe of Brunſwick, when, on the death of the emperor Henry IV., in 1197, Philip, duke of Swabia, his brother, in quality of guardian to his minor nephew, Frederic, aſſumed the adminiſtration of the empire. A party, inſtigated by pope Innocent III., roſe in oppoſition to the houſe of Swabia, and elected Otho king of the Romans. He was at this time in Poitou, with his uncle Richard I. of England, and haſtening into Germany, he collected forces, and repaired to Aix-la-Chapelle, where he was crowned by the archbiſhop of Cologne. On the other ſide, the partizans of the Swabian family conferred the ſame honour upon Philip, and a civil war deſolated all Germany. Otho loſt a powerful ſupporter on the death of king Richard; for John, who ſucceeded him, abandoned the intereſts of his nephew. In 1205, Otho took refuge in England, and Philip was left without a rival; but while he was treating for a reconciliation, and employing himſelf in gaining the affections of his ſubjects, he was baſely murdered by a private hand in 1208. On this event Otho ſo ingratiated himſelf with the clergy and pope, that Innocent invited him into Italy to receive the imperial crown at his hands. In 1209 he croſſed the Alps, and was crowned king of Lombardy at Milan, and emperor at Rome. In the following year he made incurſions into the territories of Frederic, king of the Two Sicilies, although that prince was under the protection of the holy ſee. Innocent, enraged at this proceeding, fulminated an excommunication againſt him, which he cauſed to be publiſhed and generally circulated through the empire. He was depoſed, and Frederic, the ſon of the former emperor, Henry VI., placed on the throne in his ſtead. Otho, without heſitation, returned to Germany, aſſembled his friends, and commenced hoſtilities againſt the oppoſite party: he was, however, ſoon defeated, and gladly retired to Brunſwick, where he paſſed four years in a private condition, devoting himſelf to exerciſes of devotion, and then died, A.D. 1218. Univer. Hiſt.

Otho, a celebrated chronicler of the twelfth century, the ſon of Leopold, marquis of Auſtria, and Agnes, daughter of the emperor Henry IV., was educated for the eccleſiaſtical profeſſion, and was appointed, in very early life, by his father, provoſt of the college which he had founded at Newenburg, in Auſtria. He afterwards ſpent ſome years in his ſtudies at Paris, and then became abbot of a monaſtery of Ciſtertians at Moribond, in Burgundy. In 1138 his brother, Conrad III., created him biſhop of Frienjen, in Bavaria. He afterwards accompanied that prince in his expedition to the Holy Land, and was frequently conſulted by him in his affairs, as he was alſo by Frederic Barbaroſſa, who was his nephew. Otho died at Moribond in 1158. He is ſaid to have been the firſt, or, perhaps, more probably, among the firſt of the German prelates who were verſed in literature, and acquainted with the Ariſtotelian philoſophy. It is, however, as a hiſtorian that his memory has been preſerved. He compoſed a chronicle from the creation to his own times, in ſeven books: another book is added relating to antichriſt, and the end of the world: alſo, in two books, a narrative of the actions of Frederic Barbaroſſa. Theſe writings were firſt made public by John Caſpinian, and the chronicle was afterwards publiſhed, with the addition of more than 50 chapters, by Uriſitius of Baſil, in his Hiſtory of celebrated Germans. It is alſo contained in the collections of Piſtorius and Muratori.

OTHOMAN. See Ottoman.

OTHONE, *οθονη* and *οθονιον*, among the ancients, a kind of linen garment worn by women.

OTHONI, a word uſed by chemical writers for what they otherwiſe call the *mercury of the philoſophers*, or *philoſophic ops*.

OTHONNA, the name given by ſome authors to a ſtone found in Egypt, and deſcribed to be always in ſmall pieces, and of the colour of poliſhed braſs: probably it is ſome ſpecies of the pyrites.

Othonna, in *Botany*, a name which occurs in Pliny,

and which is called οθονια by Dioſcorides. The word is derived from οθονη, *a linen cloth*, or *napkin*, from the external downy or cottony clothing of ſome of the original ſpecies. Linn. Gen. 449. Schreb. 585. Willd. Sp. Pl. v. 3. 2371. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 276. Juſſ. Gen. 181. Lamarck Dict. v. 4. 664. Illuſtr. t. 714. Gærtn. t. 170. (Jacobæaſtrum; Vaill. Mem. Par. 1720. 15.)—Claſs and order, *Syngeneſia Polygamia Neceſſaria*. Nat. Ord. *Compoſitæ Diſcoideæ*, Linn. *Corymbiferæ*, Juſſ.

Gen. Ch. *Common calyx* perfectly ſimple, of one leaf, obtuſe at the baſe, acute, equal, divided into eight or twelve ſegments. *Cor.* compound, radiated; *florets* of the diſk perfect, numerous, tubular, five-toothed, ſcarcely longer than the calyx: thoſe of the radius female, moſtly eight, or as many as the ſegments of the calyx, ligulate, lanceolate, longer than the calyx, three-toothed, reflexed. *Stam.* (in the perfect florets) Filaments five, capillary, very ſhort; anthers united into a cylindrical tube the length of the floret. *Piſt.* (in the perfect florets) Germen oblong; ſtyle thread-ſhaped, ſcarcely longer than the ſtamens; ſtigma cloven, ſimple: the female or ligulate florets differ only in having their ſtigma reflexed and larger. *Peric.* none, except the unchanged, permanent calyx. *Seeds* only in the female florets, ſolitary, oblong, naked or crowned. *Recept.* naked, dotted.

Obſ. In ſome ſpecies the ſeeds are crowned with down; in ſome the calyx is divided beyond the middle; in others it is only toothed, but the ſame ſhape or figure is obſervable in all.

Eſſ. Ch. Receptacle naked. Down generally none. Calyx of one leaf, divided, nearly cylindrical.

Obſ. When this genus was firſt eſtabliſhed by Linnæus, a number of plants were included in it, which are now referred to other places. Of thoſe which remain, and which have the calyx of one leaf, the moſt eſſential mark of *Othonna*, the following are examples. Profeſſor Willdenow has thirty-five ſpecies, and thefe are divided into two ſections; the firſt of which comprifes ſuch ſpecies as have cut or pinnate leaves; the ſecond, ſuch as have their leaves undivided, and toothed or entire.

* *Leaves cut or pinnate.*

O. *pectinata*. Wormwood-leaved African Ragwort. Linn. Sp. Pl. 1309 Curt. Mag. t. 306. (O. foliis pinnatifidis: laciniis linearibus parallelis; Mill. Dict. t. 194. f. 2.)—Leaves pinnatifid or pectinated, downy; the ſegments linear, toothed at the outer margin. Native of Africa and the Cape of Good Hope. It flowers with us in May and June, and was introduced into the gardens by Mr. Philip Miller in 1731. *Stem* ſhrubby, two or three feet high, much branched, covered with a hoary down. *Leaves* white with down, cut into many narrow ſegments, almoſt to the mid-rib; thefe ſegments are equal and parallel, having two or three teeth at their tips. *Flowers* on long, axillary ſtalks, towards the extremities of the branches, of a yellow colour. *Seeds* purple. Linnæus obſerves that the whole plant is often tomentoſe, and that the ſtem is ſcarred.

O. *pinnata*. Pinnated African Ragwort. Linn. Suppl. 387. Willd. n. 8. Sims in Bot. Mag. t. 768.—Leaves pinnatifid; the ſegments lanceolate, entire, decurrent.—A native of the Cape of Good Hope, flowering with us in May. This plant was conſidered by Linnæus, in his *Species Plantarum*, as a variety of *bulboſa*, from which however it was ſeparated, by Thunberg's advice, in the *Supplementum* of his ſon.—*Root* tuberous. *Stem* waved, almoſt proſtrate, ſlender. *Lower leaves* pinnated; upper undivided, obovate, obtuſe; all of them glaucous. *Flowers* terminal, yellow. It is remarked, in the Botanical Magazine, that this ſpecies has "a very particular manner of ſleeping, the petals being neatly rolled back every evening from the apex to the baſe, remain in this ſtate till morning, when they again expand."

O. *Athanaſiæ*. Fennel-leaved African Ragwort. Linn. Suppl. 386. Jacq. Hort. Schoenbr. v. 2. 62. t. 242. (Jacobæa africana fruticans, foliis abrotani major; Volck. Hort. 225.)—Leaves pinnate, thread-ſhaped. Calyx many-toothed.—Native of the Cape, flowering from December to February. *Stem* ſhrubby, round, ſcarred, erect, two or three feet high, branched, darkiſh brown, reſinous. *Leaves* numerous, much ſpreading, pinnate; their ſegments lanceolate, graſſy, or fennel-like. *Flowers* ſolitary, terminal, ſtalked, yellow, large, and handſome. The whole plant has a ſmell like turpentine.

O. *abrotanifolia*. Southernwood-leaved African Ragwort. Linn. Sp. Pl. 1310. (Jacobæa africana fruticans, foliis abrotani minor; Volck. Hort. 225. tab. ad finem.)—Leaves pinnate, much divided, linear. Joints of the ſtem villoſe.—Native of the Cape. It was cultivated by Miller in 1759, and flowers with us from January to March. *Stem* low and ſhrubby, branched. *Leaves* thick, like thoſe of Sampire, and cut into many narrow ſegments. *Flowers* ſolitary, terminal, on ſhort ſtalks, yellow.

** *Leaves ſimple, or undivided.*

O. *tenuiſſima*. Slender ſimple-leaved African Ragwort. Linn. Mant. 118. Willd. n. 32. Jacq. Hort. Schoenbr. v. 2. 61. t. 239.—Leaves thread-ſhaped, fleſhy. Stem ſhrubby.—Native of the Cape, flowering in March and April.—*Stems* ſhrubby, erect, branched, four feet in height, ſcarred. *Leaves* ſcattered, ſeſſile, linear, acute, entire, fleſhy, hairy when young, ſmooth when old. *Flowers* ſolitary, on axillary ſtalks, yellow. Linnæus well gueſſed the genus by the habit; ſee *Mant.*

Willdenow enumerates twenty-two ſpecies under this ſection of the genus, and thirteen under the firſt. Jacquin makes *Cineraria perfoliata* of Linnæus an *Othonna*, but we are inclined to think with Willdenow that it ſhould not be removed from the former genus. *O. filicaulis* of Jacquin does not appear to be generically diſtinct from *Cineraria perfoliata*.

Othonna, in *Gardening*, contains plants of the ſhrubby, exotic, evergreen kind, of which the ſpecies cultivated are; the bulbous African ragwort (O. bulboſa); the wormwood-leaved African ragwort (O. pectinata); the ſouthernwood-leaved African ragwort (O. abrotanifolia); the buck's-horn-leaved African ragwort (O. coronopifolia); the ſtock-leaved African ragwort (O. cheirifolia); and the tree African ragwort (O. arborefcens.)

*Method of Culture.*—All theſe plants may be increaſed, by planting ſlips and cuttings of the young ſhoots or branches during the ſummer months, in pots filled with fine earth, plunging them in an old tan hot-bed under glaſſes, carefully ſhading them from the heat of the ſun till perfectly rooted; their ſtriking may be promoted by being covered with ſmall glaſſes. When they are become well rooted, they ſhould be removed with balls into ſeparate pots filled with loamy mould, placing them in a ſheltered ſhady ſituation till autumn.

They ſhould be preſerved in a good greenhouſe in the winter, having as much free air as poſſible, and in the ſummer placed in a ſheltered warm ſituation.

The fifth ſort may ſometimes be preſerved in the open ground in ſuch ſituations.

They

They produce variety among other potted plants of the greenhouſe kinds.

OTHUMA, in *Geography*, a town of Arabia, in the province of Yemen; 80 miles N.N.E. of Mocha. N. lat. 54° 32′. E. long. 43° 57′.

OTIBAR, a town of Spain, in the province of Granada; 12 miles W.N.W. of Motril.

OTIOSI, in the *Hebrew Cuſtoms*. The learned are exceedingly divided about the *decem otioſi*, *ten idle perſons*, ſpoken of in the Jewiſh ſynagogues.

Some ſay they were the three preſidents and the ſeven readers; others, that they were ten perſons hired to attend conſtantly at the ſynagogue, becauſe, without the number ten, it could be no regular ſynagogue, or legal aſſembly; ſo that the decem otioſi were ten idle folks kept in pay, to form by their preſence a legal ſynagogue or quorum.

Vitringa, in his Archi-Synagoga, refutes this opinion; and will have the otioſi to have been ten directors or officers in the ſynagogue.

He ſhews, that each ſynagogue had its directors; that the number was greater or leſs, according to the dignity of the ſynagogue; that the ſmalleſt had at leaſt two; that, from the earlieſt times, each ſynagogue had its chief, called *archi-ſynagogus*, who had two colleagues, to be preſent at the ceremonies, and other acts of religion, and to take care every thing were done with decency; but that the archi-ſynagogus reſerved to himſelf the power of teaching: that, beſides theſe three, the archi-ſynagogus named ſeveral readers, who read in the ſynagogue every ſabbath, and that theſe made the decem otioſi of the ſynagogue; ſo called, becauſe, being diſengaged from all other employment, their whole attendance was on divine ſervice.

OTIS, the Buſtard, in *Ornithology*, a genus of birds of the order Gallinæ: of which the generic character is; bill ſubconvex; noſtrils oval, pervious; tongue bifid, pointed; feet formed for running; three-toed, tall, naked above the thighs. Of this genus there are eleven ſpecies deſcribed in Gmelin, and nine by Latham. We ſhall, as uſual, follow the arrangement of the former writer, noticing, as in other articles, thoſe that belong to our own country by means of an aſteriſk.

Species.

*Tarda; Great Buſtard. Wave-ſpotted with black and rufous, beneath whitiſh, head of the male, and throat on each ſide, creſted. This bird is found in the plains of Europe, Aſia, and Africa, but has never been obſerved in America. In England it is met with on Saliſbury Plain, and in the wolds of Yorkſhire; it was formerly ſeen in flocks of forty or fifty. It is the largeſt of Britiſh land birds, weighing from twenty-five to thirty pounds. It runs with great rapidity, ſo as to eſcape the purſuit of common dogs, but falls ſpeedily a victim to the grey-hound, which often overtakes it before it has the power to commence its flight, the preparation for which, in this bird, is ſlow and laborious. The female lays her eggs on the bare ground, never more than two in number, in a hole ſcratched out by her for the purpoſe; and if theſe are touched or ſoiled during her occaſional abſence, ſhe immediately abandons them. The male is diſtinguiſhed by a large pouch, beginning under the tongue, and reaching to the breaſt, capable of holding ſeven quarts of water. This is uſeful to the female during incubation, and to the young before they quit their neſt; and it has been obſerved to be eminently advantageous to the male-bird himſelf, who, on being attacked by birds of prey, has often diſcomfited his enemies by the ſudden and violent diſcharge of water upon them. Theſe birds are ſolitary and ſhy, and feed principally upon graſſes, worms, and grain. They were formerly much hunted by dogs, and conſidered as ſupplying no unintereſting diverſion. They ſwallow ſtones, pieces of metal, and other hard ſubſtances.

Arabs; Arabian Buſtard. Ears with erect creſts. It inhabits Aſia and Africa, and is the ſize of the laſt.

*Tetrax; Little Buſtard. The head and throat of this ſpecies are ſmooth. It inhabits ſouthern Europe and Aſia; is rarely found in England; is ſeventeen inches long; the eggs are of a ſhining green; the fleſh is blackiſh. The bill is grey-brown; crown black, with rufous bands; temples and chin reddiſh-white, with ſmall dark ſpots; neck of the male black, with a white collar; body above varied with black, rufous, and white; beneath and outer edge of the wings white. It is ſhy and cunning: if moleſted it will fly two hundred paces, and run ſo faſt that a man cannot overtake it.

Afra; White-eared Buſtard. It inhabits the Cape of Good Hope, and is twenty-two inches long. In the male the bill and legs are yellow; the crown cinereous; the wings with a large blotch; neck behind, and thighs above the knees, with a white collar; fourteen tail feathers; the female is cinereous, and her thighs and belly black.

Bengalensis; Indian Buſtard. Black; area of the eyes brown; back, rump, and tail, ſhining brown. It inhabits, as its name imports, Bengal, and is thirteen inches long.

Aurita; Paſſarage Buſtard. This ſpecies is black; the body above reticulate with brown; the hind head has four capillary feathers on each ſide, rhombic at the tips; the ſpot on the wings and ears white. It inhabits India, and is the ſize of O. tetrax. The bill is of a whitiſh-brown; the legs are yellowiſh.

Houbara; Ruffed Buſtard. Yellowiſh, ſpotted with brown; feathers of the neck long, whitiſh, with black ſhafts; the quill-feathers black, with a white ſpot in the middle. It inhabits Africa and Arabia, and is the ſize of a capon.

Rhaad. This is an Arabian bird; the hind head of the male has a black-blue creſt; the head is black; body above, and wings yellow, ſpotted with brown; the belly is white; the tail is browniſh, with tranſverſe black ſtreaks. The bill and legs robuſt.

Indica; White-chinned Buſtard. The upper part is ferruginous, waved with white and black, beneath whitiſh; chin white; crown, area of the eyes, and a ſtreak on each ſide the head, is black. It inhabits India, and is the ſize of the next ſpecies. The legs are browniſh.

*Oedicnemus; Thick-kneed Buſtard. This ſpecies is greyiſh; the two firſt quill-feathers are black, white in the middle; bill ſharp pointed; legs cinereous. It inhabits Europe, Aſia, and Africa; feeds in the night on worms, caterpillars, and reptiles; breeds in holes, or among ſtones on the bare ground; the eggs are of a copper colour, ſpotted with darker red; makes a piercing ſhrill cry, and migrates. The bill is black; legs greeniſh-yellow; lower eye-lid naked, pale yellow; above and beneath the eyes there is a yellow line; from the bill under the eyes to the ears there is a brown line; the knees are thick, as if ſwollen; belly and thighs white.

Chilensis. Head and throat ſmooth; body white; crown and tail-feathers cinereous; primary quill-feathers black. It inhabits Chili, is even larger than the O. tarda; is gregarious, and feeds on herbs; it is thought not to belong to this genus. The tail, which conſiſts of eighteen feathers, is ſhort; it has four very thick toes.

OTISFIELD, in *Geography*, a town of America, in Cumberland county and ſtate of Maine; E. of Bridgetown, and containing 450 inhabitants.

OTITES Digitus, the *ear-finger*, a name given by authors to the finger next the little one.

OTITIS, from *ους*, *the ear*, inflammation of the ear.

OTLEY, in *Geography*, a market town in the upper diviſion of the wapentake of Skirack, liberty of Cawood, Wiſtow, and Otley, and Weſt Riding of Yorkſhire, England, is ſituated under a cliff called Chevin, near the ſouth bank of the river Wharfe. This town was formerly remarkable for the great quantity of oats cultivated in its neighbourhood, and ſold at the market, which is held on Friday, and ſtill affords a very plentiful ſupply of that ſpecies of grain. Here was an hoſpital for lepers in the time of Edward II., who were bound to keep the bridge over the Wharfe in repair. No veſtiges of this building now remain, neither can any traces be diſcovered of the ancient palace of the archbiſhops of York, to whom the manor of Otley was given by king Athelſtan. In 1673 this town ſuffered ſeverely from an inundation, which ſpread to a conſiderable diſtance over the adjoining country. Here is a free grammar-ſchool, founded in 1611. The church is a large and rather elegant edifice, and contains a great variety of monumental erections in honour of the families of Fairfax, Fawkes, Vaſaſour, Palmes, and Pulleyn. From the population returns of 1811, Otley appears to contain 573 houſes, and 2602 inhabitants.

The vicinity of this town preſents to the eye a very rich and beautiful proſpect, particularly when ſurveyed from the ſummit of the Chevin. It abounds with gentlemen's ſeats, among which Newhall, Weſton, Farnley-Hall, Denton Park, and Harewood-Houſe, are the principal. The latter, the chief ſeat of lord Harewood, is one of the moſt magnificent manſions in England. It was erected by the late lord, who laid the foundation in 1760. The ſtyle of the architecture is Corinthian; and the whole is fitted up ſuitably to its external grandeur. The extenſive pleaſure grounds and gardens were laid out by the juſtly celebrated Browne. Near this manſion may be ſeen the ancient church of Harewood, rendered truly venerable by containing the tomb of that illuſtrious and virtuous judge, ſir William Gaſcoigne, of Gawthorpe, who committed to priſon the then prince of Wales, afterwards Henry V., for offering inſult to him on the bench. The ruins of the caſtle are ſeated on a lofty eminence overlooking the Wharfe. Theſe are very extenſive, covering above an acre of ground, but, from their extremely dilapidated condition, it is impoſſible to form a correct idea of the conſtruction and appearance of this immenſe pile in its priſtine ſtate. Farnley-Hall, the ſeat of Walter Fawkes, eſq. is about three miles north of Otley, and is juſtly ranked among the fineſt manſions of the county, on account of the ſcale of the houſe, the ſtyle in which it is fitted up, its ſuperb and valuable collection of paintings and drawings, and for the natural character of the ſurrounding country. Its preſent poſſeſſor has diſplayed, on many occaſions, a refined taſte, and ſound political principles. Beauties of England, &c. vol. xvi. Yorkſhire, by J. Bigland.

OTMARSCH, a town of Holland, in the department of Overiſſel, ſeated on the river Dinckel; nine miles N. of Oldenzeel.

OTODINI, in *Ancient Geography*, a people of Britain, N.E. of the Brigantes, who inhabited the countries now called Northumberland, Merſe, and the Lothians. As the Otodini are not mentioned by any of the Roman hiſtorians, but only by Ptolemy, it is uncertain whether they formed a diſtinct, independent ſtate, or were united with the Brigantes. They were, however, a conſiderable people and poſſeſſed a long tract of the ſea-coaſt, from the river Tine to the Firth of Forth. Their name is derived by Baxter from the old Britiſh words "Ot o dineu," which ſignify a high and rocky ſhore, deſcriptive enough of their country. They were probably reduced by Agricola at the ſame time with their more powerful neighbours the Brigantes: but as they lived without the walls of Severus, they were, like the reſt of the Mæatæ, engaged in frequent revolts. In the moſt perfect ſtate of the Roman government in this iſland the country of the Otodini made a part of the Roman province called Valentia, which comprehended all that large tract between the two walls. As this province was never long together in the peaceable poſſeſſion of the Romans, they had but few ſtations in the country of the Otodini, except thoſe on the line of the wall of Severus. Beſides theſe, there were two or three Roman towns without the wall, ſituated on or near the military way which ran through their country into Caledonia, which are mentioned both by Ptolemy, and in the Itinerary of Antoninus. Theſe towns were Barmenium, now Riechcſter, and Curia or Corſtupitum, now Corbridge. Between theſe two towns, and at a little diſtance from the military way, at a place now called Riſingham, there are very conſpicuous veſtiges of a Roman ſtation; which, from the inſcription of an altar found there, appears to have been named Habitancum.

OTOGAMIES, in *Geography*, a tribe of Indians in the N.W. territory, who inhabit between the lake of the Woods and Miſſiſippi river. Its number of warriors is 300.

OTOMACS, or Otomaques, ſavages of America, on the Orinoco. For an account of them, ſee Oronooko.

OTOMO, in *Ornithology*, the name of a bird of the lagopus kind, called alſo *colmeſtre*, and by the Germans *ſteinhum*, that is, *ſtonehen*. It is of the bigneſs of a tame pigeon; its belly and wings are white, with only a very few browniſh feathers; its head, neck, and breaſt are variegated with brown feathers, and the upper part of the neck with black and white; its beak is very ſhort and black, and it has fine red granulated membranes over its eyes; its tail is principally black, but is variegated with brown and white; and its legs and feet are feathered to the ends of the toes.

Mr. Ray is of opinion, that this is the ſame ſpecies of bird with the common white lagopus, it being no way different but in colour, and thoſe birds being ſaid to change colour in the ſummer months. It is caught in the mountains of Germany, and is a very delicate bird for the table.

OTOORACITE, in *Geography*, a ſmall iſland in the South Pacific ocean, near the eaſt coaſt of Otaheite.

OTOPLATOS, in *Surgery*, a fetid diſcharge from behind the ears.

OTOPUOSIS, from *ους*, *the ear*, and *πυον*, *pus*, a purulent diſcharge from the ear.

OTOQUE, in *Geography*, a ſmall iſland on the weſt coaſt of New Mexico, in the bay of Panama; 30 miles S.S.W. of Panama. N. lat. 8° 30'. W. long. 80° 20'.

OTOROWA, a town of the duchy of Warſaw; 16 miles W. of Poſen.

OTORRHŒA, in *Surgery*, from *ους*, *the ear*, and *ῥεω*, *to flow*, a diſcharge of blood, or bloody matter, from the ear.

OTOULINGOW, in *Geography*, a town of Chineſe Tartary. N. lat. 43° 54'. E. long. 128° 16'.

OTRAHARMANA, La, a ſmall iſland in the Eaſt Indian ſea, near the weſt coaſt of Luçon. N. lat. 15° 55'. E. long. 120° 6'.

OTRANTO, a province of Naples, bounded on all ſides,

ſides, the weſt excepted, by the ſea. On the weſt it is joined to Bari. It is about 60 miles in length, and from 20 to 25 in breadth. Its principal productions are olives, figs and grapes. As a guard againſt the incurſions of the corſairs, towers are erected at ſmall diſtances along the coaſt. Beſides Lecce, whence it is ſometimes called "the country of Lecce," and Otranto, the principal towns are Tarento, Brindiſi, Matera, Caſtro, Gallipoli, Motala, Sta. Maria de Leuca, Aleſſano, Ugento, Nardo, Oſtuni, and Caſtellaneta.—Alſo, a city and ſea-port of Naples, and capital of the above province. It was a Roman colony, and erected into an archbiſhopric in the 16th century. It is ſeated on a rocky iſland, and joined to another iſland by a bridge, which, by another bridge, communicates with the continent. It is ſurrounded by walls and ramparts, and defended by a citadel on a rock. The harbour is good, and the trade conſiderable. It is the ſee of an archbiſhop; 94 miles S.E. of Bari. N. lat. 40° 30'. E. long. 18° 20'.

OTRAR, or FARAL, a town of Turkeſtan, on the Arſch; formerly a place of great importance and conſiderable trade. After a brave defence, it was taken by Jenghis Khan. The celebrated Timur Bec died here; 55 miles W. of Taraz.

OTRAU, a town of Moravia, in the circle of Prerau; 20 miles N.E. of Prerau.

OTRICOLI, a town of Italy, in the Sabina, near the Tiber, formerly the ſee of a biſhop. In this place are the ruins of a theatre and other magnificent buildings; 24 miles S.W. of Spoleto.

OTROKOTSKIFORIS, FRANCIS, in *Biography*, an Hungarian, who completed his ſtudies at Utrecht, and became miniſter in his native country. He afterwards renounced the Proteſtant religion, and obtained ſome preferment in the ſtate. He died at Tirnau in 1718. His works are, 1. "Origines Hungaricæ," 2 vols. 8vo. 2. "Antiqua Religio Hungarorum vere Chriſtiana et Catholica," 8vo.

OTSEGO, in *Geography*, a county of New York, on the ſouth ſide of Mohawk river; bounded north by Herkemer county, eaſt by Schoharie, ſouth by Delaware, and weſt by Chenango. This county is interſected by the headwaters of the Suſquehannah, and the Cookquago branch of the Delaware. It contains 1788 inhabitants. The courts are held at Cooperſtown, in the townſhip of Otſego. In 1791, when the county was thinly ſettled, 300 cheſts of maple ſugar, at 400 lbs. *per* cheſt, were manufactured here. —Alſo, a townſhip and lake, in the above county. The townſhip was taken from Unadilla, and incorporated in 1794. On the eaſt the townſhip includes lake Otſego, which ſeparates it from Cherry valley. The lake is the head of Suſquehanna river, and is about nine miles long, and ſomewhat more than a mile wide. The lands on its banks are good, and eaſily cultivated. The townſhip contains 4224 inhabitants.

OTSKE, a town of Turkiſh Armenia; 20 miles N.W. of Akalziké.

OTT, JOHN HENRY, in *Biography*, a learned Swiſs divine, was born in the canton of Zurich in the year 1617. He received the early part of his education at Zurich, and in 1635 was ſent to purſue his ſtudies at Lauſanne. From thence he went to Geneva and Groningen; and in the latter place diſtinguiſhed himſelf by his great proficiency under the inſtructions of Gomar and Alting. He then ſpent five years at Leyden and Amſterdam, chiefly in the ſtudy of the Oriental languages. After this he took a tour to England and France; and upon his return to his native country, he was preſented with a good living, which he ſerved 25 years. In 1651 he was nominated to the profeſſorſhip of eloquence at Zurich; in 1655, to that of Hebrew; and in 1668, to that of eccleſiaſtical hiſtory. He died in 1682, leaving behind him a high reputation for various learning, and a great number of works, which were highly eſteemed on account of the erudition diſplayed in them. Of theſe we may mention a treatiſe "On the Grandeur of the Church of Rome;" "Annals relating to the Hiſtory of the Anabaptiſts;" "A Latin Diſcourſe in favour of the Study of the Hebrew Language;" "A Latin Treatiſe on Alphabets, and the Manner of Writing in all Nations." He had a ſon, John Baptiſt Ott, born in 1661, who acquired great celebrity by his knowledge of the Oriental languages and antiquities. He was paſtor of a church at Zollicken, and afterwards profeſſor of Hebrew at Zurich. In 1715 he was promoted to the archdeaconry of the cathedral in that city. He was the author of ſeveral works of conſiderable reputation: as, "A Diſſertation on Vows;" "A Letter on Samaritan Medals, addreſſed to Adrian Reland:" both theſe are written in the Latin language; a treatiſe in German, "On the Manuſcript and printed Verſions of the Bible before the Era of the Reformation;" and "A Diſſertation on certain Antiquities diſcovered at Klothen, in 1724." Moreri.

OTTA, in *Geography*, a town of Portugal, in Eſtramadura; 24 miles N.N.E. of Liſbon.

OTTACANO, a town of Naples, in the province of Lavora; 11 miles E. of Capua.

OTTANI, GAETANO, in *Biography*, a tenor-ſinger in the ſervice of the king of Sardinia, who, in 1770, with an excellent tenor voice, ſung with taſte, and in a pleaſing manner. Though the opera-houſe was ſhut, and we had not an opportunity of hearing him on the ſtage, we heard him in private ſing two or three airs in different ſtyles, which diſcovered him to be a maſter of the art he profeſſed. He likewiſe was a good painter in the manner of Claude Lorrain, and Du Vernet, and was ſometimes employed by his Sardinian majeſty as a painter.

OTTATI, in *Geography*, a town of Naples, in Principato Citra; 10 miles S.W. of Cangiano.

OTTAVA, a town of Naples, in the province of Bari; 11 miles S.S.E. of Monopoli.

OTTAWA, a river which riſes in the ſouth part of Bohemia, and runs into the Muldau, 12 miles E. of Blatna.

OTTAWAS, or UTAWAS, called alſo *Grand River*, a river of Canada, which is the moſt important of all the tributary ſtreams of the great river St. Lawrence, iſſues from various lakes towards the centre of Canada, and falls into the St. Lawrence about 30 miles above Montreal; forming, by its confluence with that river, "Le Lac de deux Montagnes et le Lac St. Louis," *i. e.* the lake of the two mountains, and the lake of St. Louis, in which are ſeveral iſlands. The water of the Utawas river is remarkably clear, and of a bright greeniſh colour; whilſt that of the St. Lawrence, on the contrary, is muddy, owing to its paſſing over deep beds of coral for ſome miles before it enters into lake St. Louis. For a conſiderable way down the lake, the waters of the two rivers may be plainly diſtinguiſhed from each other. At the mouth of the Utawas river is ſituated the iſland of Perot, about 14 miles in circumference, the ſoil of which is fertile, and well cultivated. The North-Weſt Company principally carries on its fur-trade by the Utawas river. For this purpoſe they make uſe of canoes, formed of the bark of the birch tree; ſome of which are conſtructed upon ſuch a large ſcale, that they are capable of containing two tons; but they ſeldom put ſo much in them,



eſpecially

eſpecially in this river, as it is in many places ſhallow, rapid, and full of rocks, and contains no leſs than 32 portages. The canoes are navigated by the French Canadians, who prefer this employment to that of cultivating the ground. Having aſcended the Utawas river for about 280 miles, which it takes them about 18 days to perform, they then croſs by a portage into lake Niſpiſſing; and from this lake, by another portage, they get upon French river, that falls into lake Huron on the north-caſt ſide; then coaſting along this laſt lake, they paſs through the ſtraits of St. Mary, where they have another portage into lake Superior; and coaſting afterwards along the ſhores of lake Superior, they come to the Grand Portage on the north-weſt ſide of it; from hence, by a chain of ſmall lakes and rivers, they proceed on to the Rainy lake, to the lake of the Woods, and for hundreds of miles beyond it, through lake Winnipeg, &c. The canoes, however, which go ſo far up the country, never return the ſame year: thoſe intended to bring back cargoes, immediately ſtop at the Grand Portage, where the furs are collected ready for them by the agents of the company. At the Grand Portage, and along that immenſe chain of lakes and rivers which extend beyond lake Superior, the company has regular ports, where the agents reſide; and they have alſo eſtabliſhed trading ports within 500 miles of the Pacific ocean. Weld's Travels through Lower Canada, &c. vol. i. See FUR.

OTTAWAS, a tribe of Indians who inhabit the eaſt ſide of lake Michigan, 21 miles from Michillimackinack, in Wayne county or territory. Their hunting grounds lie between lakes Michigan and Huron. About 30 years ago they could furniſh 200 warriors. A tribe of them alſo lived near St. Joſeph's, and had 150 warriors. Another tribe lived with the Chippewas, on Saguinan bay, who together could raiſe 200 warriors. Two of theſe tribes, lately hoſtile, ſigned the treaty of peace with the United States, at Greenville, Aug 3, 1795. In conſequence of lands ceded by them to the United States, government has agreed to pay them in goods 1000 dollars a-year for ever.

OTTENDORF, a town of Germany, in the duchy of Bremen, capital of a ſmall county called Hadeln, on the river Meden; 24 miles N. of Stade. N. lat. 53° 50'. E. long. 8 53'.

OTTENGRUN, a town of Saxony, in the Vogtland; 6 miles S.W. of Oelſnitz.—Alſo, a town of Germany, in the principality of Culmbach; 4 miles N. of Munahberg.

OTTENHEIM, a town of Auſtria, on the north ſide of the Danube; 5 miles W.N.W. of Lintz.

OTTENSCHLAG, a town of Auſtria; 7 miles S. of Zwetl.

OTTENSTAIN, a town of Auſtria; 8 miles E. of Zwetl.

OTTENSTEIN, a town of Germany, in the biſhopric of Munſter; 25 miles W.N.W. of Munſter.

OTTER, JOHN, in *Biography*, profeſſor of Arabic at Paris, was born at Chriſtianſtadt in Sweden, where his father had amaſſed conſiderable property. In 1724 he was ſent to the high ſchool at Lund, where he alſo applied himſelf to natural philoſophy and theology; and here, by intercourſe with perſons of the Catholic perſuaſion, he began firſt to feel ſerious doubts with regard to the reformation introduced by Luther, and at length abjured the Lutheran tenets; and the count de Braneas, French ambaſſador at the Swediſh court, reſolved to ſend this new convert to France. He was admitted into the ſeminary at Rouen, and, after a reſidence of three years, was called to Paris by cardinal Fleury, who gave him an appointment in the poſt-office; a ſituation for which he was exceedingly well qualified, by a very extenſive knowledge of modern languages. Having recommended himſelf, by his talents and aſſiduity, to the notice of count Maurepas, that nobleman determined to ſend him to the Eaſt, in order that he might make himſelf maſter of the Oriental languages, and, at the ſame time, diſcover the beſt means of reviving the French trade in Perſia. He accordingly embarked at Marſeilles, in January 1734, and arrived at Conſtantinople in March. His principal object, while in this capital, was to learn the Turkiſh and Arabic languages: for that purpoſe, he frequented the company of the moſt learned men in that city, and particularly attached himſelf to Ibrahim Effendi, known as well by his literary labours, as by the eſtabliſhment of a printing-office at Conſtantinople. Having attained a good knowledge of the languages referred to, he felt himſelf in a condition to proceed to Perſia, which he did in December 1736. After a journey of eight months, he reached Iſpahan, which exhibited a moſt melancholy ſpectacle, having been reduced almoſt to a heap of ruins by the fury of the Afghans, who, in the midſt of a bloody war, had nearly over-run the empire. The ſituation of the country, at that period, deterring Otter from making any attempts towards the re-eſtabliſhment of the French trade in Perſia, he devoted himſelf to the ſecondary object of his journey, *viz.* the acquiring of the language. In 1739 he ſet out for Buſſorah, on the Perſian gulf, where he concluded a commercial treaty with the pacha of Bagdad, and where he reſided nearly four years, firſt in a private capacity, and afterwards as conſul of the French nation. The commotions which had agitated Perſia ſpread at length to Buſſorah; and in 1741, the ſpirit of inſurrection roſe to ſuch a height, that the neighbouring Arabs, throwing off all reſtraint, appeared in a ſtate of open rebellion. For two months they kept the town completely blockaded. Otter participated in the general diſtreſs, but the terror of the ſituation did not prevent him from purſuing the ſtudy of the languages. With the help of a preceptor, he began a tranſlation of the New Teſtament into the Turkiſh language, for the uſe of the Chriſtians in that neighbourhood; and he had nearly completed the work, when he received orders, in the month of May 1743, to return to France, which he did by the way of Conſtantinople. On his return, after an abſence of ten years, he publiſhed, under the patronage of count Maurepas, a work entitled "Voyages en Turquie et en Perſe, avec une Relation des Expeditions de Thamas Kouli Khan, Paris, 1748." This work, beſides a great many uſeful obſervations in regard to the names and ſituations of places, determined by Arabian aſtronomers, remains of antiquity, natural hiſtory, and accounts of the manners and cuſtoms of the Perſians, and other eaſtern nations, contains a ſhort account of the revolution effected in Perſia by the celebrated Kouli Khan, with ſome anecdotes of his life. (See KOULI KHAN.) Soon after the return of M. Otter to France, he was appointed by count Maurepas to be interpreter of the oriental languages in the king's library; an office which enabled him to render the knowledge that he had acquired during his long travels of more utility to literature. He began to compile a view of the political changes produced by the followers of Mahomet, from the origin of their religion to the preſent time; taking as a foundation of his work the writings of the celebrated Noviari, an hiſtorian of the 14th century, who is reckoned one of the moſt authentic ſources of information on that ſubject. In 1746, after completing a part of this undertaking, he was appointed Regius profeſſor of Arabic; and in 1748 he was elected a member of the Academy of Inſcriptions. Soon after his admiſſion,

admiſſion, he read "A Diſſertation on the Conqueſt of Africa by the Arabs;" and this was to have been followed by another of the conqueſt of Spain, but in conſequence of his premature death, the work remained unfiniſhed, as did ſeveral others which he had projected. He died at Paris, in 1749. Otter was a man of great learning and integrity, mild in his manners, and of a modeſt diſpoſition. Gen. Biog.

Otter, in *Geography*, an iſland in the North ſea, on the coaſt of Norway, at the mouth of Romſdal bay. N. lat. 62° 45'. E. long. 7 9'.

Otter, a river of England, which runs into the ſea, about 5 miles E. of Exmouth.

Otter *Bay*, a bay on the S. coaſt of Newfoundland, between Bear and Swift bays, and near cape Ray.

Otter *Creek*, a river of America, in Vermont, which riſes in Bromley, and purſuing a northern direction about 90 miles, diſcharges itſelf into lake Champlain at Ferriſburg, receiving in its courſe about fifteen ſmall tributary ſtreams. It has ſeveral falls, between which the water is navigable for the largeſt boats. Veſſels of any burden may go up to the falls at Vergennes, 5 miles from its mouth. The head of this river is not more than 30 feet from Batten Kill, which runs in a contrary direction and falls into Hudſon's river.—Alſo, a ſmall ſtream, which runs into Kentucky river, E. of Boonſborough.

Otter, *Peaks of*, the higheſt mountains on the Blue Ridge of Virginia, which, meaſured from their baſes, are ſuppoſed to be more lofty than any others in North America. The principal peak, according to Mr. Jefferſon, is about 4000 feet in perpendicular height.

Otter's *Head*, a lofty rock on the N. ſhore of lake Superior. N. lat. 48° 4'. W. long. 85° 55'.

Otter, in *Zoology*. See Mustela.

Otter, *Hunting*. See Hunting.

OTTERBACH, in *Geography*, a river of France, which riſes near Weiſſemburg, and runs into the Rhine, about 10 miles above Germerſheim.

OTTERBERG, a town of France, in the department of Mont Tonnerre, and chief place of a canton, in the diſtrict of Kaiſerſlautern; 5 miles N. of Kaiſerſlautern. The place contains 1374, and the canton 5359 inhabitants, in 20 communes.

OTTERPIKE, in *Ichthyology*, the name of a large ſpecies of the *draco marinus*, or ſea-dragon, called in Engliſh the *weaver*: it is not much larger than the weaver, but is of a great variety of beautiful colours; and, inſtead of the yellow ſide-lines which that fiſh has, this has rows of large black ſpots. See Trachinus *Draco*.

OTTERSBERG, in *Geography*, a town of the duchy of Bremen, defended by a fort with four baſtions; 16 miles E. of Bremen. N. lat. 53° 9'. E. long. 9° 11'.

OTTERY St. Mary, a market town in the hundred of that name and county of Devon, England, is ſituated near the bank of the river Otter, at the diſtance of 12½ miles from the city of Exeter and 161 from London. It is a large, irregularly built town, and is chiefly ſupported by its manufactories of flannel, ſerge, and other woollen goods. The market day is Tueſday every week, and Carliſle ſtates there are fifteen fairs annually. Here is a grammar ſchool, formerly kept by the father of the poet Coleridge. The church is a ſpacious edifice, poſſeſſing many ſingularities in its conſtruction. On the north and ſouth ſides are ſquare towers, which open into the body of the church, and form two tranſepts, as in the cathedral at Exeter. Both theſe towers are ſurmounted by ſmall turrets and open battlements, and that on the north has likewiſe a ſmall ſpire in the centre. A chapel, erected by biſhop Grandiſon at the north-weſt corner of the building, diſplays a very richly ornamented ſpecimen of architecture, but this and almoſt every other part of the church has ſuffered much from neglect. The monuments are numerous, and many of them curious both with reſpect to deſign and execution. Cloſe to the church-yard ſtand ſome of the old collegiate houſes, belonging to a college which was founded here by the biſhop above mentioned, "for a warden, ten vicars, a maſter of muſic, two pariſh prieſts, eight ſecondaries, eight choriſters, and two clerks." In one of theſe buildings is a large hall, which Oliver Cromwell uſed as a convention room; and in Mill-ſtreet are the remains of the ancient manſion of the celebrated ſir Walter Raleigh. According to the late population returns (1811), the houſes in this town and pariſh are eſtimated at 587, and the inhabitants at 2880 in number. The petty ſeſſions for the hundred are held here.

Clyſt-houſe, lately built by lord Graves, occupies the ſcite of one of the ancient palaces of the biſhops of Exeter. It is a very noble edifice, and commands ſeveral rich and extenſive views over the adjacent country. The other principal ſeats in this vicinity are Cadhay, and Faringdon-houſe. The latter is a very ſpacious manſion, and ſurrounded by luxuriant plantations. Windmill-hill, near this houſe, is ſaid to have been the poſition of a Roman encampment. Polwhele's Hiſtory and Antiquities of Devonſhire, folio. Beauties of England and Wales, vol. iv. by John Britton, F.S.A. and E. W. Brayley.

OTTFRIDE, in *Biography*, a German Benedictine monk, who flouriſhed in the ninth century, was a diſciple of Rabanus, archbiſhop of Mentz, and ſpent the greater part of his life in the monaſtery of Weiſſemburg in Lower Alſace. He became greatly diſtinguiſhed in ſacred and profane literature, and wrote a variety of works in proſe and verſe. He directed his attention to the improvement and purification of the German language, then called the Teutonic, and with this view drew up a grammar, or rather perfected in part that commenced by the emperor Charlemagne. In order that the common people might be inſtructed in the goſpel hiſtory, he wrote a work in Teutonic rhymes, divided into five books, containing the principal circumſtances of the life of Chriſt, taken from the four evangeliſts, and in the order of time. This work was publiſhed by Flacius Illyricus in 1571, but more correctly afterwards by Lambecius, who gives an account of the other works of Ottfride, among which are "Homilies" upon the evangeliſts; and paraphraſes on other parts of the ſacred ſcriptures, &c. Moreri.

OTTINGHAH, in *Geography*, a town of Meckley; 68 miles W. of Munnypour.

OTTMACHAU, a town of Sileſia, in the principality of Neiſſe, on the river Neiſſe; 6 miles W. of Neiſſe. N. lat. 56° 20'. E. long. 17° 2'.

OTTOK, a town of Croatia; 28 miles S.S.W. of Carlſtadt.

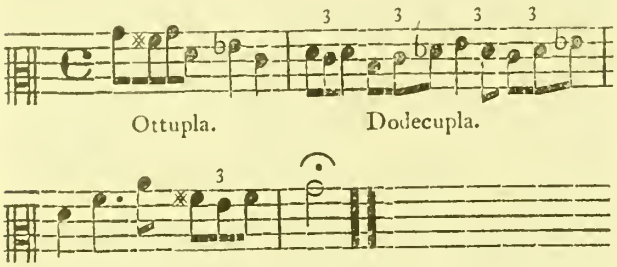
OTTOMAN, or Othoman, an appellation given to the empire of the Turks, or rather to their emperors, from Othomannus, or Oſman, the firſt prince of the family. This Oſman, to diſtinguiſh his followers from others, gave them the name of Oſmanles, from which, by the change of the *s* into *t*, we have made Ottomans; which new name ſoon became formidable to the Greeks of Conſtantinople, from whom Oſman conquered a ſufficient extent of territory to found a powerful kingdom. He ſoon beſtowed on it that title, by aſſuming, in 1300, the dignity of Sultan, which ſignified abſolute ſovereign. The true era of the Ottoman empire may be dated from the conqueſt of Pruſa. The eſtabliſh-

eſtabliſhment of the Ottomans in Europe took place A.D. 1353. See Orchan, Othman and Turkey.

OTTONE, in *Geography*, a town of the Ligurian republic; 21 miles N.E of Genoa.

OTTSBERG, Otzberg, or *Utzberg*, a town of Heſſe-Darmſtadt; 26 miles N. of Heidelberg.

OTTUPLA, in the *Italian Muſic*, ſignifies *octuple*, or the meaſure of four times: it is marked with a ſemicircle, C; and ſometimes thus:  when it is to be played very quick. In this time, eight quavers are contained in a bar. But it often happens, that ſuddenly, inſtead of two quavers for every time of the bar, three are required; this is called *dodecupla*. It is enough to place a 3 over three quavers, or notes of equal value, to ſhew that the meaſure muſt be changed; and when this 3 is omitted, it ſufficiently demonſtrates the meaſure to be ottupla again: this makes what is called by the Italians *ottupla è dodecupla*, thus:




Corelli, in the laſt movement of his tenth ſonata, opera terza, very often uſes an 8 for the dodecupla, to ſhew, that the triple there is changed to common time.

OTTWEILLER, in *Geography*, a town of France, in the department of the Sarre, and chief place of a canton, in the diſtrict of Sarrebruck; 13 miles N. of Sarrebruck. It is ſituated among mountains, and contains a caſtle, a Proteſtant and Roman Catholic church. The place includes 1460, and the canton 7288 inhabitants, in 28 communes.

OTUBUE, a ſmall iſland in the South Pacific ocean, near the coaſt of Bolabola.

OTUGUNGE, a town of Bengal; 24 miles S. of Calcutta.

OTURA, a town of Spain, in the province of Grenada; 5 miles S. of Grenada.

OTUS, in *Ornithology*, the name of the common horn-owl of the ſmaller kind, in many reſpects different from the great horn-owl or eagle-owl. See Strix.

OTUTUCLA, in *Geography*. See Maouna.

OTWAY, Thomas, in *Biography*, an eminent writer of tragedy, born in 1651, at Trotting in Suſſex, was educated at Wickeham, near Wincheſter, and in 1669 he was entered a commoner of Chriſtchurch, but he left the college without taking his degrees, and without any determination as to the profeſſion which he meant to purſue. He went to London and commenced actor, but not meeting with much ſucceſs he turned his thoughts to writing for the ſtage, and in 1675 produced his firſt tragedy of "Alcibiades." In the ſame year he brought out his "Don Carlos, Prince of Spain," which proved a ſource of great profit, and reſcued the author from a ſtate of extreme indigence. Either his talents as an actor or a writer introduced him to the acquaintance and patronage of men of faſhion and pleaſure, among whom was the earl of Plymouth, a natural ſon of Charles II., who procured for him the commiſſion of cornet in a newly raiſed regiment deſtined for Flanders. This was in the year 1677, and he accompanied his troops to the continent; through habits of diſſipation he returned very ſoon in a ſtate of poverty, reſumed the occupation of writing for the ſtage, and among other pieces he compoſed two tragedies on which his fame is chiefly built, namely "The Orphan," and "Venice Preſerved." Theſe made their appearance in 1680 and 1682. In 1685 he was obliged to conceal himſelf from his creditors, and took refuge in a public-houſe on Tower-hill, where, on the 14th of April, he terminated a miſerable life, at the early age of thirty-four. It was reported, that being nearly famiſhed, he begged a ſhilling of a gentleman, and that he was actually choaked with the bread which he purchaſed and was devouring in the moſt ravenous manner. Dr. Johnſon does not give credit to the ſtory, and Pope was informed that he died of a fever, occaſioned by his exertions in the purſuit of a thief who had robbed one of his friends. "His memory," ſays one of his biographers, "aſſociated with the tender ſcenes that he has written, has been celebrated in various pathetic lamentations for his hard fate, but like many of his fellow-ſufferers, he was too deficient in moral qualities to excite that regard which is the only foundation of ſober ſympathy. Beſides the diſſolutenefs of manners diſplayed in his life and writings, he was a ſhameleſs flatterer of the great, and ſeems to have had no other public principle than that of a ſervile attachment to authority." The tragedies already mentioned are juſtly accounted ſome of the moſt tender and pathetic that the Engliſh theatre exhibits. No Engliſh poet ever excelled him in touching the paſſions. The heart that does not melt at the diſtreſſes of his Orphan can ſcarcely be human. "Venice Preſerved," without a virtuous character excepting the heroine, at all times excites the deepeſt intereſt, and is at this day very popular, and frequently acted in London, and at the moſt reſpectable country theatres. Although its purpoſe was to paint the horrors and vices of popular inſurrection, he has put into the mouth of his revolutionary hero ſuch forcible declamation againſt the corruptions of government, and ſuch glowing ſentiments of patriotiſm, that it has, occaſionally, even in our times, been thought unfit for public repreſentation. Beſides his dramatic works he compoſed ſome pieces of poetry, which, however, have very little merit. The lateſt edition of Otway's works is that of the preſent year, 1813, in four vols. 8vo. In the year 1719 was printed a piece aſcribed to Otway, but certainly not written by him; it was called "Heroic Friendſhip." That at the time of his death he had made ſome progreſs in a play, is pretty certain from the following advertiſement, printed in L'Eſtrange's Obſervator, Nov. 26, 1686: "Whereas Mr. Thomas Otway, ſome time before his death, made four acts of a play; whoever can give notice in whoſe hands the copy lies, either to Mr. Thomas Betterton, or to Mr. William Smith, at the Theatre Royal, ſhall be rewarded for their pains." Biog. Brit. Johnſon's Lives of the Poets, and Biog. Brit.

OVA, Eggs, in *Natural Hiſtory*. See Egg.

Ova, in the *Human Anatomy*. See Fœtus and Generation.

Ova, among the ancients, a kind of verſes, wherein the verſes were reduced to the form of an egg.

Ova, in *Architecture*, are ornaments in form of eggs, carved on the contour of the ovolo, or quarter round; and ſeparated from each other by anchors or arrows' heads.

The Engliſh uſually call theſe ornaments *eggs and anchors*.

Inſtead of eggs, the ancients ſometimes carved hearts, on which occaſion it was that they introduced arrows, to ſymbolize love.

OUABASH, in *Geography*. See Wabash.

OUA-CONG-YN, a town of Thibet; 32 miles S.W. of Hami.

OUADA, or Goa, a town of the Ligurian republic, on the borders of France; 18 miles N.N.W. of Genoa.

OUAGIK, a town of Aſiatic Turkey, in Natolia; 3 miles S. of Iſmid.

OUAIS's Bay, a bay on the N. coaſt of the iſland of cape Breton, in the gulf of St. Lawrence.

OVAL, in *Geometry*, a curve reſembling the contour of an egg, whence its name. The proper oval, or egg-ſhape, is an irregular figure, being narrower at one end than it is at the other; that is, the extreme breadth is not in the middle of its length. In this it differs from the ellipſis, which is the mathematical oval, and is equally broad at both ends.

In the common acceptation of the word the two curves are confounded together, but geometricians conſider the oval as a falſe ellipſe. A figure bounded by circular arcs, ſo meeting as to coincide at the points of meeting with the tangents to the arcs, and as it does not in appearance differ from an ellipſis, is by artificers called an oval.

It may be thus deſcribed, to any given length and breadth. Let the given length A B, (*Plate* II. *fig.* 1. of *Drawing Inſtruments*), and breadth D E, biſect one another, at right angles, at the point C; aſſume the diſtances A F, L B, equal to each other, but leſs than half the breadth C D. Take D G equal to A F; join F G, which divide into two equal parts at H, and from H draw the right line H I perpendicular to F G, meeting the diameter C E in I, and ſet off C K = C I, draw I N and I O, K M and K A. This done, about the centres F and L, with the diſtances A F, L B, deſcribe two ſmall arcs M A N, A B O; which will form the ends of the curve; and about the centres K and I, with the diſtance I N, deſcribe two arcs N D O, M E A, and the oval required will be deſcribed. This curve, though it is called an oval, differs both from the true ellipſis, produced by the oblique ſection of a cone or cylinder, and alſo from the oval or egg-ſhape figure, which is broader at one end than at the other; in fact, it is nothing more than ſegments of different circles combined into one curve, which rather imitates the ellipſis than the oval, its ends being ſimilar.

The egg-ſhaped curve may be deſcribed by means of an inſtrument which has of late been produced with the intention of deſcribing ellipſes, though for this purpoſe it is inapplicable: the principle of its action is explained by *fig.* 2. *Plate* II. In this, ſuppoſe A B an inflexible right line or ruler, the end B connected by a joint to a crank C, which revolves upon a fixed centre D; therefore the end B of the ruler deſcribes the circumference of a circle; the end A of the ruler has a pin projecting from the under ſide of it, which enters a narrow ſtraight groove, its direction being in the line of the centre D: this groove confines the end B to move in a right line tending to the centre of the circle, which the other end, A, deſcribes when the crank is turned round. Now a tracing-point applied at any part of the line A B, will deſcribe a real oval or egg-ſhape, the proportion between its length and breadth being determined by the part of the ruler where the tracer is applied; ſuppoſe it at G, which is half way between the two extremes A, B, then the breadth will be very nearly equal to one-half of the length; at D, which is one-fourth from B, the breadth will be very near three-fourths of the length; and at F, which is one-fourth from the end A, the breadth will only be about one-fourth of the length. It is eaſy to explain this: the length of the oval muſt evidently be equal to the diameter of the circle deſcribed by the crank C; but the breadth will be diminiſhed from this quantity, in the proportion of the parts of the lever A G B, conſidering the end A as its fulcrum, B the point where the action is applied, and G the point where the effect is produced. This reaſoning is general, for if the tracing-point is conſidered as removed to the point B, or within a very ſmall diſtance from it, the oval will have its diameters equal to each other, or the difference between them will be exceedingly ſmall, in which caſe it becomes a circle, or very near it: in like manner, if the point is removed to A, the breadth of the oval will be nothing, producing a ſtraight line. If the ruler is continued beyond the crank to the point H the curve is altered, the breadth being equal to the diameter of the circle, and the length increaſed in proportion to the lever A B H. The reaſon why this curve is larger at one end than the other is, that the point of greateſt elongation of the point B, is when the crank C forms a perpendicular with the ruler A B; this happens at the point *a* of the circle, and produces the greateſt breadth of the curves, as is ſhewn at *b c d*; but theſe points are not equidiſtant, from the two extremes of the length, which will be at *e*, *f*, and *g*; therefore, the line of greateſt breadth, of all curves deſcribed by this means, will not divide the length into equal halves, which is an eſſential condition of the mathematical ellipſis.

The true, or mathematical ellipſis, is a curve which ſo frequently occurs in delineating circular objects in perſpective, that artiſts, as well as geometricians, have been anxious to diſcover a general mode of drawing ſuch curves to any dimenſions and proportions. The principles of ſeveral methods are given in the article Ellipsis; but only one of theſe has been applied in the conſtruction of inſtruments, (ſee Compasses, *Elliptic*,) which is generally denominated by artificers a trammel: this is imperfect, becauſe it will not deſcribe very ſmall or narrow ellipſes, ſuch as are chiefly required in drawing.

Mr. Wilſon Lowry, whoſe engravings accompany this work, has for ſome years made uſe of a very perfect and curious machine for engraving the ellipſes on his plates, many beautiful ſpecimens of which are to be found in our plates of aſtronomical inſtruments, horology, planetary machines, &c.; it operates upon the principle of the elliptic chuck uſed by turners for forming picture frames, and other elliptical work (ſee Rose Engine); but being conſtructed with various adjuſtments for the purpoſe of engraving only, it is not ſo applicable for drawing, as another inſtrument upon a new conſtruction, invented by Mr. John Farey, jun. from whoſe drawings moſt of the above ſubjects are engraved. The Society of Arts have lately preſented the inventor with their gold medal for this inſtrument, which is deſcribed in the 31ſt volume of their Tranſactions. A plan of it is given in our plate at *fig.* 3, and an edge view in *fig.* 4, ſhewing its thickneſs. The general ſize is twice as large as the drawing, but it may be made of any dimenſions at pleaſure. When uſed, it is placed upon the paper or ſurface where the ellipſis is to be deſcribed, and the ſquare frame is held faſt by the left hand, while the moving circles are turned round by the other, to trace the curve by means of a drawing-pen properly ſituated. The moving parts of the inſtrument conſiſt of two circles, A, B, of equal dimenſions, ſo fitted together that they will ſlide one upon the other, by means of the pinion K, uſed to ſeparate their centres any required diſtance within their radii.

The circles have no central bar, but inſtead thereof have two bars *a a*, *a a*, parallel to each other, and at ſome diſtance from the centre, leaving an open ſpace between them, in which the drawing-pen or tracing-point is ſituated: there are two crooked arms *b*, *b*, proceeding from the bars *a*, *a*, to the circular rim, to give it ſufficient ſtrength; and theſe being all the bars acroſs the circles, leave them very open

to ſee the curve, as it is traced beneath by the drawing-pen. The circles are united by ſcrews at *c*, *c*, ſcrewed into the lower circle, and the two bars of the upper circle, being included between them, keep the two together, but at the ſame time admits of their ſliding one upon the other, in the manner of the figure: at *e e* are two other ſcrews tapped into the upper circle, and retaining the lower one in the ſame manner. The centre-pin for the pinion K is fixed on one of the arms of the lower circle, and acts upon a rack, *d*, ſcrewed to the upper circles, ſo that it ſeparates the two, when turned round by the finger and thumb, applied to the milled head upon it.

The circles are fitted together ſo tight by the ſcrews *c c*, and *e e*, that they will not ſeparate from each other, except by the action of the pinion; and may, in the uſe of the inſtrument, be conſidered as firmly united together, though capable of having any degree of excentricity given to them by means of the pinion K.

The circles are turned round in their frame by means of ſix ſmall handles, *f*, fixed in the upper circle, to any oppoſite two of which the thumb and finger of the right hand may be applied. The frame, or fixed part of the inſtrument, conſiſts of four ſtraight rulers D, E, F, G; the latter are ſcrewed down upon the former, and are therefore in a plane above them, as ſhewn by *fig.* 4, plates of braſs being interpoſed between them at the angles, to ſeparate them to a proper diſtance. The lower circle, A, is fitted in between the two lower rulers D, E, and ſlides freely in the direction of their length, but has no ſhake ſideways: in like manner, the upper circle, B, is included between the edges of the rulers F, G, and therefore moves in a right line, in a direction perpendicular to the former. Thus the frame forms two grooves at right angles to each other, in which the circles revolve with an excentric motion, the upper circle ſometimes hanging over the lower rulers, and the lower circle paſſing under the upper rulers, as is ſhewn in the figure. The reſult of this motion is, that a tracer, placed on any part of the circles, when they are rendered excentric, will deſcribe an ellipſis on the ſurface beneath; but the only tracer which is uſed in drawing is ſituated between the bars *a*, *a*: thus, into this ſpace a ſmall carriage, or frame, *g*, is fitted, to ſlide freely from one end of the opening to the other, by means of a rack, *h*, ſcrewed on one ſide of it, and a pinion, L, turning on a centre-pin, fixed into the upper circle: the frame has a braſs ſocket, H, moving on a centre-pin, and having a hole in it for the reception of the leg of a pair of common drawing compaſſes, M, which ſtand as in *fig.* 4: when in uſe, the pen, M, traces the curve upon the paper, but they admit of being turned up on the centre-pin of the ſocket H, and then, for the convenience of ſetting the inſtrument, the circles can be turned about without making any marks. The tranſverſe ſection (*fig.* 5.) ſhews the frame *g g*, and the manner in which it is fitted into the circles, A, B, alſo the ſocket, H, moving on its centre-pin, and the two pair of racks *d*, *h*, and pinions K, L; the former for the purpoſe of ſeparating the circles, and the latter for moving the pen-frame, *g*, along between them: the frame, *g*, is ſo fitted, that it continues at the ſame point with reſpect to the upper circle, when the centres of the two are ſeparated from each other by the pinion K, and may, therefore, be conſidered as immoveable when the lower circle only is moved.

To keep the frame of the inſtrument ſtationary upon the paper whilſt it is uſed, two ſharp pins are fixed in the ruler P, which penetrate the paper, and make it quite faſt, when they are held down by the finger and thumb of the left hand applied upon the heads of nuts N, O; theſe are introduced to unite the ruler P with the ends of the two upper rulers F, G, but the ſcrews of theſe nuts paſſing through grooves in the ruler P, admit the whole inſtrument to be moved on the paper, a ſmall quantity, parallel to itſelf, in the direction of the ruler P; though the friction of the fitting is ſo great, that it will not move unleſs ſome force is applied for that purpoſe: the ſcrews where they paſs through the ends of the rulers F, G, are alſo received in grooves, ſo that by unſcrewing the nuts the whole inſtrument can be moved ſideways, a ſmall quantity nearer or farther from the ruler P; but by ſcrewing theſe nuts faſt, the ſcrews become fixed to F, G, though they ſtill admit of moving in the grooves of the ruler P.

The reader will now comprehend the ſtructure of the inſtrument. The circles are capable of revolving in the frame, ſet with any required degree of excentricity, and the tracing-point or pen can be removed to any required diſtance from the centre of the upper circle. The compaſſes being opened to the extent of two marks made upon one of the bars, G, of the frame, and then being fixed in the inſtrument by puſhing them into their ſocket H, it is ready for uſe. In this ſtate, ſuppoſe the two circles ſet by the pinion, K, exactly concentric with each other, and the pinion, L, turned till the end of the frame, *g*, comes in contact with the rim of the inſtrument, then the point of the tracer will come exactly in the centre of both circles, and the circles being turned round in the frame, the pen will only mark a ſmall point on the paper, which will be the centre of any curve the inſtrument may be made to deſcribe. By turning the pinion, L, the breadth of the ellipſe will be determined, and by the other the difference between its breadth and length is regulated. Suppoſe the pinion, K, turned to render the circles excentric, without moving the other, and the pen therefore remains in the centre of the upper circle; in this caſe the pen will deſcribe a ſtraight line, equal in length to twice the excentricity of the circles: this is evident, becauſe the circumference of the upper circle moving againſt the ſtraight edges F, G, its centre muſt deſcribe a line parallel thereto: this caſe may be conſidered as an ellipſis without breadth, for if the pen is ſet the ſmalleſt quantity out of the centre of the upper circle, it will draw a very narrow ellipſe, and by ſetting it at different diſtances from the centre, any required proportion of ellipſe may be deſcribed.

The conjugate diameter will, in all caſes, be equal to double the diſtance from the point of the pen to the centre of the upper circle, and the difference of the conjugate and tranſverſe diameters will be always equal to twice the excentricity of the two circles.

The principle on which this inſtrument operates is the ſame as the trammel employed by carpenters and other artificers for ſtriking ovals, by means of a board with two croſs grooves in it, and a beam or radius-bar, which has two pins to ſlide in the grooves, and a third to draw the curve. To prove this, ſuppoſe P P and Q Q, (*fig* 6.) to be the two diameters of the intended ellipſes; then if the three points, *d*, *e*, and *f*, are fixed upon an inflexible bar, and the points *d* and *e* conſtantly applied to the two diameters, while a tracing-point, ſituated at *f*, is carried round by the bar; the latter will deſcribe an ellipſis. This is the principle of the trammel; but its defects, as at preſent conſtructed, are well known. 1. It will not draw any ellipſis, which is leſs in either of its dimenſions than the ſize of the board or frame containing the croſs grooves repreſenting the two diameters P P and Q Q; nor can it draw much larger, unleſs the diameters are nearly equal. 2. It is difficult to fix the croſs firmly on the paper, or to bring it to the exact point required for the centre of the ellipſe. And 3. When this is

 done,

done, the moſt perfect workmanſhip in the grooves and ſliders can ſcarcely enſure that it ſhall move freely without ſhake or improper motions, ſo as to make an accurate and fair curve.

All theſe defects are obviated in the preſent invention, by extending the two points *d* and *e*, to become the large circles A, B, *fig.* 3; then the rulers D, E, F, G, repreſent the ſides of the grooves in which the points move: the point of the pen of the compaſſes now repreſents the point *f* in all its properties of moving along the bar, to enlarge or diminiſh the ellipſe, but with the advantage that it can be actually brought to coincide with one of the points *d* or *e*, when of courſe it will draw a ſtraight line, and if brought to match with both of them, it will deſcribe only a point; therefore this inſtrument will deſcribe any poſſible variety of ellipſe within the limits of its radius, either as to ſize or proportion of its diameters.

In the uſe of this inſtrument, when any ellipſis of given dimenſions is to be drawn, the paper is prepared by drawing the two diameters about four inches long; upon each of theſe ſet off, with the compaſſes, the four points where the intended curve is to interſect the lines. This preparation is not eſſential, but it aſſiſts in ſetting the inſtrument in its true place. The drawing pen of the compaſſes is to be filled with Indian ink from a camel's-hair pencil, and the ſcrew adjuſted, that the pen will draw a proper line; then the leg of the compaſſes being fixed into the braſs ſocket H, ſo that they have no ſhake or looſeneſs in the fitting, the inſtrument is ready for uſe; turn the circles about in the frame, to bring the pen towards the ſide marked G; now place the whole inſtrument in ſuch a poſition, that the centre of the four rulers coincides with the centre of the intended ellipſis. This may be eſtimated, or, by previouſly producing the two diameters, the frame may be ſet very nearly, taking care to place the upper rulers F, G, parallel to the greateſt diameter: here fix the inſtrument by preſſing the two pins or points of the ruler P into the paper, and hold it faſt by placing the thumb and fore-finger of the left-hand upon the nuts N, O; leaving the other hand at liberty to turn the circles about, by applying the finger and thumb to any oppoſite two of the ſmall handles *f*. Now by turning the pinion L, remove the drawing pen to the mark made for the extent of the ſhorteſt diameter of the ellipſis; then turn the circles one-half round by the handles, and examine if the point of the pen comes exactly to the oppoſite mark for the end of the ſhorteſt diameter; if it does not, adjuſt the error, one-half by moving the pen, by turning the pinion L, and the other half, by moving the whole frame on the paper. The ſcrews of the nuts N, O, will admit this motion, being fitted into grooves in the ruler P, (which ſhould not be diſturbed,) but the nuts ſhould not be ſcrewed ſo tight as to prevent the motion; then, by returning the circles back again its accuracy will be aſcertained; for if it meets the former mark, it proves that the circles are in the right centre, and the compaſſes are ſet to the proper diameter for the conjugate axis: now turn the pen towards the length of the ellipſis, and without altering the compaſſes or pinion L, ſlide the circles one upon another by the pinion K, till the point of the pen arrives at the mark made for the length of the ellipſis: turn the circles half round to the oppoſite end, and if they match the mark made there the adjuſtment is correct; if not, one-half the error muſt be corrected, by moving the circles by their pinion K, and the other by moving the whole frame ſideways on the paper. To do this, the nuts N, O, muſt be made ſlack, and then the frame will be at liberty to move; but the ruler P muſt never be removed after the firſt fixing, and the ſide of the frame will, of courſe, be at a greater or leſs diſtance from it. The adjuſtments being made in this manner, the pen may be ſuffered to reſt upon the paper and trace round the curve. The precautions of turning the circles to the oppoſite ſides will be unneceſſary, except where great accuracy is required. In turning the circles about, a habit will be acquired of preſſing with equal force on the two oppoſite ſides of the circles, and then they will turn round eaſily.

It will ſave much trouble, in adjuſting the place of the inſtrument upon the paper, if the compaſſes, before being put into the ſocket H, are opened to the extent of the two marks upon the bar G; then the compaſſes are put into their ſocket, and if this is removed by turning the pinion, L, till the end, *g*, comes in contact with the rim of the circle, the point of the pen will come exactly into the centre of the ellipſis which it is intended to deſcribe; if, therefore, the centre of the ellipſis is marked upon the paper, and the point of the pen (when opened to the above extent, and the ſocket kept back as far as it will go) being brought by moving the whole frame on the paper to this mark, the inſtrument is adjuſted at once as to its poſition on the paper, and the other adjuſtments for the dimenſions of the ellipſis required to be drawn may be made as before directed.

After having drawn an ellipſis, if it is required to draw another parallel to it, to ſhew the thickneſs of a circular plate, for inſtance, ſet the pen oppoſite G, and by the ſcrews of the nuts N, O, as before mentioned, being fitted in grooves, the frame and the circles may be moved with the longer axis parallel to itſelf, ſo as to deſcribe another ellipſis parallel to the former. By this means all kinds of circular mouldings, wheels, &c. may be drawn with the greateſt accuracy and expedition; but the various uſes to which it is applicable, are beſt ſhewn by the numerous perſpective drawings in our plates, wherein Mr. Farey employs it for all the ellipſes.

OVAL *Column.* See COLUMN.

The ancients have been repreſented as authoriſing this deformed figure for the plan of a column: but this is a miſtake, probably occaſioned by the diſcovery of fragments, where flanked columns have been ſet back to back againſt a ſcreen or wall of nearly the ſame width with the diameters of the columns: theſe remains, defaced by time, might ſuggeſt, to a ſuperficial enquirer, that the column originally had an oval baſe.

OVAL *Crown.* See CROWN.

OVAL *Ellipſis*, an oblong curvilinear figure with two unequal diameters; or a figure encloſed with a ſingle curve line, imperfectly round, its length being greater than its breadth, like an egg; whence its name. See OVAL.

The method of deſcribing an oval, chiefly uſed among workmen, is by a cord or ſtring, as F *f* M (*Plate* IX. *Conics*, *fig.* 18.) whoſe length is equal to the greater diameter A B of the oval, and which is faſtened, by its extremes, to two points or nails, F, *f*, planted in its longer diameter; by which means the oval is made ſo much the longer, as the two points or nails are farther apart.

OVAL *Foramen, Ruptures of*, in *Surgery*. See HERNIA.

OVAL *Leaf*, in *Botany*. See LEAF.

OUALALDE, in *Geography*, a town of Africa, in the country of the Foulahs, on the ſide of the Senegal. N. lat. 18° 45′. W. long. 13° 8′.

OVALE FORAMEN, in *Anatomy*. See HEART.

OVALLE, ALONZO DE, in *Biography*, a Jeſuit, was

born at Santiago in Chili, and became procurador-general of the order in that province. He went to Rome to obtain a ſupply of miſſionaries, and there he publiſhed a work entitled "Hiſtorica Relacion del Reyno de Chile, y de las miſſiones y miniſterios que exercita en el la Compania de Jeſus," 1646. "This," ſays Mr. Southey, "is a book of great value, though it is meanly printed, and the engravings are execrably bad. At the end of the copy now before me are ſome views of the Jeſuit ſettlement in Chili, and of the ſix principal forts, which were publiſhed ſeparately to be purchaſed at pleaſure. They are, without exception, the very worſt I have ever ſeen." An abridgment of Ovalle's work is in Churchill's collection. Gen. Biog.

OUAN, in *Geography*, a town of Corea; 53 miles W.S.W. of Koang.—Alſo, a town of China, in the iſland of Hai-nan; 75 miles S. of Kiong-tcheou.

OUANAMINTHE, a town of Hiſpaniola; 15 miles S.E. of Fort Dauphin.

OUANDERON, in *Zoology*. See SIMIA *Silenus*.

OVANDO, in *Geography*, a province or duchy of the kingdom of Congo in Africa, ſituated between Congo and Angola, now in the poſſeſſion of the Portugueſe, but formerly ſubject, or tributary, to the kings of Congo. Its capital, called St. Michael, is ſeated on the river Danda, but is a place of no great note.

OUANGARUM, a river of Canada, which runs into the St. Lawrence, N. lat. 44° 37'. W. long. 75° 45'.

OUANG-KOA, a town of Corea; 28 miles E.S.E. of Koang-tcheou.

OUANLIN-HOTUN, a town of Chineſe Tartary; 588 miles N.E. of Peking.

OUANNE, a town of France, in the department of the Yonne; 9 miles S.W. of Auxerre.

OUAQUAPHENOGAW, or EKANFANOKA, or *Okerſonoke*, a lake or rather marſh of America, between Flint and Oakmulgee rivers, in Georgia, about 300 miles in circumference. In wet ſeaſons it appears like an inland ſea, and has ſeveral large iſlands of rich land, one of which is repreſented by the Creek Indians as the moſt bliſsful ſpot on earth. They ſay it is inhabited by a peculiar race of Indians, whoſe women are incomparably beautiful. They alſo relate many other wonderful ſtories concerning this iſland, which it is needleſs to recite.

OUANTOU, in *Ornithology*. See PICUS, *lineatus*.

OVAR, in *Geography*, a conſiderable town or villa of Portugal, in the province of Beira; 15 miles S. of Oporto. It contains 1300 houſes, of which many are large and handſome. An arm of the Vouga, which is properly a lake, and which is narrow for three leagues and then becomes much broader during a league, then forming a true lake, and at length ends in a narrow channel a league long, ceaſes cloſe to Ovar.

OUARA, a town of Hindooſtan, in Bahar; 65 miles S.S.W. of Patna.

OUARANGUE, a ſmall iſland in the Atlantic, near the coaſt of Africa. N. lat. 11° 32'.

OUARDAN. See VARDAN.

OUARINE, in *Zoology*. See SIMIA *Beelzebub*.

OVARY, in *Anatomy*. See GENERATION.

OVARY, *Dropſy of*. See DROPSY.

OVARY *of Birds*. See *Anatomy of* BIRDS.

OVARY *of Fiſh*. See FISH.

OUASIOTO MOUNTAINS, in *Geography*, mountains of America, ſituated N.W. of the Laurel mountains in North Carolina and Virginia; 50 or 60 miles wide at the Gap, and 450 in length, N.E. and S.W. They abound in coal, lime, and free-ſtone. Their ſummits are for the moſt part covered with good ſoil and a variety of timber, and the intervening lands are well watered.

OVATED LEAF, among *Botaniſts*. See LEAF.

OVATION, OVATIO, in the *Roman Hiſtory*, a leſſer triumph allowed to commanders for victories won without the effuſion of much blood; or for the defeating of rebels, ſlaves, pirates, or other unworthy enemies of the republic.

Their entry was on foot; ſometimes on horſeback; but never in a chariot: and they wore crowns of myrtle, called *ovales*; having all the ſenate attending in their retinue.

The denomination ovatio, according to Servius, and Plutarch, in his life of Marcellus, is derived from *ovis*, *ſheep*; becauſe the conqueror ſacrificed a ſheep on this occaſion to Jupiter; whereas, in the greater triumph, they ſacrificed a bull.

Others derive it from the ſound or din of the acclamations and ſhouts of joy, made by the people, in honour of the ſolemnity; the people and ſoldiery, on this occaſion, redoubling the letter O, as in the great triumph they did the words, *Io triumphe*.

The ovation was firſt introduced in the year of Rome 325, in honour of the conſul Poſthumius Tubertus, after his defeating the Sabines.

OUBINSKOI MOUNTAINS, in *Geography*, otherwiſe called *Vobrofskoi*, mountains of Ruſſia, which form, at the ſources of the Ouba and Ulba, a conſiderable ridge, towering in lofty ſummits to high ſnow-mountains, ſending out its branches on both ſides of thoſe rivers, eſpecially between them, and at its foot bordered by the Irtiſch. The greateſt height riſes near Bobrofskaia with porphyry, which in the north and ſouth is frequently changed for granite, whoſe ſummits, ſometimes with gentle, and then with bold aſcents, ſurround the moſt delightful vales, abounding in odoriferous herbs of various kinds. In the region about the fortreſs Ouſtkameneyorſk, the granite is under-run by ſchiſtoſe earth, in ancient times explored by the Tſhudi, who took pleaſure in mining. Higher up the Irtiſch, as far as the Buktorma, mountains of ſchiſtus frequently appear, in which copper-ore is dug, and which is, here and there, under-run by porphyry and granite, but in many places covered with chalk. The mountains in which are the ſources of the Ouba conſiſt of granite, porphyry, marlwake, petroſilex, and quartz. Towards the eaſt the Oubinſkoi mountains rear their lofty ſummits, which, meaſured with the line, were found to be 5691 Engliſh feet above the water of the river Ouba, which devolves its pleaſant ſtreams beneath their monſtrous cliffs. In theſe mountains have been lately found the Filipotskoi mines, on the Ulba, which promiſe great ſucceſs, together with other mines. Tooke's Ruſſ. vol. i.

OUCARRA, a town of Hindooſtan, in the Myſore; 5 miles S. of Sattimungulum.

OUCENTA, a town of Naples, in Lavora; 12 miles E. of Capua.

OUCH, in our *Old Writers*, a collar of gold, or ſuch like ornament, worn by women about their necks. Stat. 24 Hen. VIII. cap. 13.

OUCHE, in *Geography*, a town of Switzerland, on the lake of Geneva; which is the port of Lauſanne.

OUCHTERMUCHTY, a borough town, ſituated in the county of Fife, Scotland, was conſtituted a royal borough by king James IV., and the charter was ſubſequently confirmed by James VI. This place ſtill continues to enjoy all its original privileges, except the right of ſending members to parliament, or to the convention of royal boroughs. The government

government is veſted in three baillies and fifteen counſellors, who are elected annually; and there is a weekly market for proviſions. A very conſiderable manufacture of brown linens and Sileſias is carried on here, as are likewiſe ſome tan-works. The pariſh extends about two miles in length and one and a half in breadth, and diſplays much variety of ſurface. In the immediate vicinity of the town the ſoil is gravelly, but at a greater diſtance is fertile. Free-ſtone and marle are abundant. According to the parliamentary returns of 1811 the whole pariſh compriſes 525 houſes, and a population of 2403 perſons. Beauties of Scotland, vol. iv.

OUDAL, a town of Norway, in the province of Aggerhuus; 40 miles N.E. of Chriſtiania.

OUDAPOUR, a town of Bengal; 15 miles E. of Comillah.

OUDATUM-OUDOUC, a town of Chineſe Tartary. N. lat. 45° 9′. E. long. 121° 28′.

OUDE, a province or ſoubah of Hindooſtan, the dominions of which lie on both ſides of the Ganges, occupying (with the exception of Fezoola Cawn's diſtrict of Rampour) all the flat country between that river and the northern mountains towards Thibet, as well as the principal part of the fertile tract lying between the Ganges and Jumnah, known by the name of Dooab, to within 40 miles of the city of Delhi. On the E. and S.E. it is bounded by Bahar, on the S. by Allahabad, ceded by treaty to the Engliſh in 1793, and on the W. by Agra. According to the ſtatement of Major Rennell, in the Introduction to his Memoir, the dimenſions of Oude, and its dependencies, may be reckoned 360 Britiſh miles in length from E. to W., and in breadth from 150 to 180; and their area is about one-third part of that of the Bengal provinces; being to each other in the proportion of 53 to 162. Generally ſpeaking, the whole territory is one continued plain; and is a continuation of that extenſive level valley through which the Ganges, and its branches, take their courſe. It is, moreover, the central part of the ancient kingdom or empire of the "Praſii." Lucknow, ſituated on the river Goomty, and about 650 miles from Calcutta, is its preſent capital; having ſuperſeded Fyzabad, a city on the Gogra, near the ancient city of Aiudh, which ſeems to have given name to the province. The nabob of Oude is in alliance with the Britiſh power: and a brigade of the Bengal army is conſtantly ſtationed on his weſtern frontier; thus anſwering the purpoſes of covering Oude as well as Bengal, and of keeping the weſtern ſtates in awe. It is advanced about 100 miles beyond Lucknow. The whole expence of it is paid by the nabob of Oude, by a ſtipulated ſum, under the name of a ſubſidy, amounting annually to 420,000*l.*, provided the Sicca rupee be valued at 2*s.* 1¼*d.* The late nabob of Oude, Sujah Dowlah, poſſeſſed, at the time when he firſt became an ally of the Eaſt India company, the whole ſoubah of Oude, and the greateſt part of Allahabad; to which, in 1774, were added the eaſtern parts of Delhi and Agra, till that time poſſeſſed by a tribe of Afghan Rohillas, and by the Jats. The Zemindary of Benares, which includes alſo the circars of Gazypour and Chunar, conſtituted a part of the dominions of Oude until the year 1775, when its tribute or quit-rent of 24 lacks (ſince increaſed to 40) was transferred to the Engliſh. This Zemindary, which was lately in the hands of Chut Sing, occupies the principal part of the ſpace between Bahar and Oude, ſo that only a ſmall part of the territory of the latter touches Bahar on the N.W. The revenues of Oude under Aurungzebe amounted to 80½ lacks of rupees; but they have more lately been reckoned in the groſs amount at about 2½ millions ſterling; of which the new acquiſitions of Rohilcund, Corah, and other parts of the Dooab, are more than one million. The military eſtabliſhment, including the troops employed in the collection of the revenues, is from 50 to 60,000 men; but few of them deſerve the name of regular troops.

The province of Oude is watered not only by the Ganges, but by the Jumnah, Agra, Goomty, and ſeveral ſmaller ſtreams; theſe flow through moſt of the principal towns, and are navigable for boats in all ſeaſons of the year. They preſent ſtrong barriers againſt the neighbouring powers. Oude has ſeven circars, *viz.* Bahraitch, Canoge, Goorackpour, Kairabad, Lucknow, Manickpour, and Oude proper.

OUDE, a circar of Hindooſtan, in the ſoubah of Oude, bounded on the N. by Bahraitch, on the E. by Goorackpour, on the S. by Jionpour and Manickpour, and on the W. by Lucknow; about 45 miles long and 16 broad. Its capital is Fyzabad.

OUDENARDE, a town of France, in the department of the Scheldt, and principal place of a diſtrict, ſituated on the Scheldt; ſuppoſed by ſome to have been built by the Goths in the year 411. It lies in a valley, on the ſide of a mountain called "Kerſelaerberg," which defends the city. It has two pariſh churches, five gates, and many good buildings. The town has two juriſdictions; one of the magiſtracy, compoſed of a grand bailiff, a burgomaſter, and nine echevins; the other in the hands of the lords: theſe juriſdictions are ſeparated by the Scheldt. This town was ſo well fortified by Francis de la Noüe, a French Calviniſt, that it was called "Little Rochelle." Oudenarde ſurrendered to the French on the 3d of July, 1794; 12 miles S. of Ghent.

OUDENBORG, a town of France, in the department of the Lys; ſix miles S.E. of Oſtend.

OUDENBOSCH, a town of Brabant; 10 miles W. of Breda.

OUDERKERCK, a town of Holland; ſix miles S. of Amſterdam.

OUDEWATER, a town of Holland, ſeated on the Little Iſſel, to which Henry de Vianen, biſhop of Utrecht, gave the privileges of a city, in the year 1254. In 1575 it was taken by aſſault, pillaged and burnt by the Spaniards, who murdered, among many others, the mother, ſiſters, and brothers, of the celebrated James Arminius, who was born here in the year 1560; 20 miles S. of Amſterdam.

OUDGAH, a town of Bengal; 54 miles S.E. of Doeſa.

OUDGASTEL, a town of Brabant; 12 miles W. of Breda.

OUDIA, Cape, or *Capoudia*, a cape on the E. coaſt of Tunis. N. lat. 30° 45′. E. long. 11° 2′.

OUDIGHIR, a town of Hindooſtan, in Dowlatabad; five miles N.W. of Beder.

OUDIN, Casimir, in *Biography*, a learned French monk, in the ſeventeenth and eighteenth centuries, who afterwards embraced the Proteſtant religion, was born at Meſières, on the Meuſe, in the year 1638. He diſcovered an early inclination for learning, and after having gone through his courſe of rhetoric, at the age of eighteen he entered among the monks of the Premontrè order at the abbey of St. Paul at Verdun. Here he applied himſelf to the ſtudies of the place, but in his future life he attached himſelf chiefly to eccleſiaſtical hiſtory, and made it a principal purſuit. In 1675 he entered holy orders, and was appointed incumbent of Epinay, in the dioceſe of Rouen. In 1677 he reſigned this benefice, and was placed by his ſuperiors in the abbey of Bucilly in Champagne. In the following year he was ſent on a viſit to all the abbeys and churches

belonging to his order, for the purpoſe of ſelecting from their archives ſuch documents as might aſſiſt him in his enquiries into eccleſiaſtical hiſtory. He firſt viſited the monaſteries in the Netherlands, whence he brought back with him a rich ſupply of materials, and in 1682 he made the ſame reſearches in the religious houſes of Lorraine, Burgundy, and Alſace. In 1683 he was ſent to Paris, where he formed connections with ſeveral eminent characters in the republic of letters, and in 1688 he publiſhed a work, by which he acquired great credit, entitled "Supplementum de Scriptoribus vel Scriptis Eccleſiaſticis à Bellarmino omiſſis, ad annum 1460, vel ad artem typographicam inventum." In 1690 he found reaſon to change his religious ſentiments and profeſſion, withdrew from France and went to Leyden, where he renounced the popiſh creed, and made a public profeſſion of the Proteſtant religion. Soon after this he was appointed ſub-librarian of the univerſity of Leyden, a poſt which he retained till his death in 1717. He was author of many other works, as "Acta Beati Lucæ Abbatis Cuiſſiacenſis:" "Veterum aliquot Galliæ et Belgii Scriptorum opuſcula ſacra numquam edita;" "Epiſtola de ratione Studiorum ſuorum;" and ſeveral others: but his principal work was entitled "Commentarius de Scriptoribus Eccleſiæ Antiquis, illorumque Scriptis; adhuc extantibus in celebrioribus Europæ Bibliothecis, a Bellarmino, Poſſevino, Phil. Labbeo, Guil Caveo, El du Pin, &c." in three volumes, folio.

Oudin, Francis, a learned French Jeſuit, was born at Vignorix, in Champagne, in the year 1673. He was ſent very young to commence his ſtudies at Langres, where he made a conſiderable progreſs in his acquaintance with the ſciences and the belles lettres. He reſolved to embrace the eccleſiaſtical profeſſion, and commenced his noviciate among the Jeſuits, at Nancy, in 1691. He afterwards became profeſſor of rhetoric at the college of Dijon, and then undertook the profeſſorſhip of theology, the duties of which he performed with high reputation during fifteen years. He died at Dijon in 1752, at the age of ſeventy-nine. He was a good linguiſt; was profoundly ſkilled in the knowledge of ſacred and profane antiquities, and in the ſcience of medals. He was alſo diſtinguiſhed by his taſte in polite literature, and had a wonderful facility in compoſing Latin verſes. He was author of many "Poems," "Odes," "Elegies," "Hymns," &c. of which the greater part was inſerted in a collection entitled "Poemata didaſcalia," in three volumes, 12mo. His proſe works were numerous, conſiſting of "Diſſertations," "Eulogies," "Lives," &c.: and alſo of Commentaries on many parts of the ſcriptures. He was, towards the cloſe of life, employed by his ſuperiors on a continuation of the "Bibliotheca Scriptorum Societatis Jeſu," which was begun by father Ribadeneira. Moreri.

OUDINET, March Antony, a medaliſt, was born at Rheims in 1643; he was profeſſor of the law at his native place, and afterwards obtained the office of keeper of the royal cabinet of medals. He was alſo a member of the Academy of Inſcriptions, and died in 1712. He wrote three memoirs on medals.

OUDIPOUR, Meywar, or *Midwar*, in *Geography*, a province of Hindooſtan, belonging to the Rajpoots, about 100 miles long, and about as much in breadth, ſituated on the E. of the river Puddah. In former times, it is probable that the whole Rajpootana conſtituted one kingdom or empire under the rajah or prince of Oudipour, who has always been conſidered as the head of the Rajpoot ſtates. In modern times this rajah ſeems to have been regarded much like the general of the Amphictyons in Greece. Oudipour is very mountainous, with a ſandy ſoil in the vallies. Its revenue in the year 1779 was eſtimated at 10 lacks of rupees *per annum*.—Alſo, the capital of the circar to which it gives name, in the country of Agimere; 120 miles S.S.W. of Agimere. N. lat. 24° 42'. E. long. 74° 42'.

OUDOBO, a country of Africa, ſubject to Benin.

OUE, a mountain of Perſia, in Khoraſan; eight miles E. of Kain.

OUEI-LO, a town of Thibet; 295 miles S.W. of Hami.

OUEI-NING, a city of China, of the firſt rank, in Koei-tcheou. N. lat. 26° 45'. E. long. 103° 50'.

OUEI-YUEN, a town of Thibet; 275 miles E.S.E. of Hami.

Ouei-yuen *Hotun*, a town of Corea; 450 miles E.N.E. of Peking.

OUE-KIUM, a town of China, of the firſt rank, in Honan, on the river Ki; 297 miles S.S.W. of Peking.

OVELGUNN, a town of the duchy of Holſtein; nine miles E.S.E. of Eutyn.

OVELGUNNE, or Ovelgoenne, a town of Germany, and chief place of a ſmall territory, which, in 1653, was annexed to the comté of Oldenburg; 16 miles N.E. of Oldenburg.

OVELTY. See Owelty.

OVEN, or *Aſſaying* Oven, in *Metallurgy*, is the particular ſort of furnace uſed by the aſſayers in their operations on metals. See *Aſſaying* Furnace.

OUEN-TCHEOU, in *Geography*, a city of China, of the firſt rank, in Tche-kian, on a river with a good harbour, not far from the ſea; 765 miles S.E. of Peking. N. lat. 28° 1'. E. long. 120° 29'.

OUEN-TCHUEN, a town of Corea; 85 miles N.E. of King-ki-tao.

OUEN-Y, a town of Corea; 20 miles S.S.W. of Outcheou.

OUEN-YEN, a town of Corea; 33 miles S.S.W. of Ou-tcheou.

OUEPAS, a town of Mexico, on the coaſt of Coſta Rica, S. of Carthago.

OVERA. See Awerri.

OVERACKEN, a ſmall iſland on the W. ſide of the gulf of Bothnia. N. lat. 63° 50'. E. long. 20° 29'.

OVERALL, John, in *Biography*, a learned prelate of the church of England, was born about the year 1559. From the grammar-ſchool he was ſent to St. John's college, in the univerſity of Cambridge, of which ſociety he was elected a ſcholar; after this he removed to Trinity college, where he was choſen a fellow. In the year 1596 he was nominated Regius profeſſor of divinity, and took the degree of doctor in that faculty. About the ſame time he was elected maſter of Catherine-hall, and ſoon after was promoted to the deanery of St. Paul's, London. On the acceſſion of James I. he was choſen prolocutor of the lower houſe of convocation, and in 1612 he was appointed one of the firſt governors of the Charter-houſe, then juſt founded. In 1614 he was nominated to the ſee of Litchfield and Coventry, from which, in four years, he was tranſlated to that of Norwich, where he died in 1619, at the age of about ſixty. He particularly excelled in ſcholaſtic theology; and declared himſelf without heſitation in favour of Arminianiſm. He is chiefly known as the author of a work entitled "The Convocation-Book," to which Dr. (afterwards biſhop) Sherlock, attributed his converſion from nonjuring principles. See Biog. Brit. notes to the article Sherlock.

OVER-BLOW, in *Sea Language*. They ſay it overblows when the wind blows ſo very hard that the ſhip can bear no top-ſails.

OVER-

OVER-BOARD denotes the ſtate of being thrown out of a ſhip or boat into the water on which ſhe ſwims; alſo the act of falling from ſuch a veſſel into the ſea, &c. as the ſhip ſprung a-leak, and obliged us to throw the guns over-board; or, a heavy ſea broke over the deck, and carried two of our men over-board.

OVERBURY, *Sir* THOMAS, in *Biography*, an Engliſh gentleman, was deſcended from an ancient family at Aſhton-under-Edge, in Glouceſterſhire. He was born in 1581, at the houſe of a maternal relation in Warwickſhire, and after having laid the foundation of his grammar learning in that country, he was entered as a gentleman commoner of Queen's college, Oxford. From this place he removed to the Middle Temple for the ſtudy of the law, to which profeſſion his father belonged, but not having a taſte for legal purſuits he endeavoured to puſh his fortune at court. About the year 1604 he contracted an intimacy with Robert Carr, the favourite of king James (ſee the article JAMES I.), who was afterwards created earl of Somerſet, and by whoſe means Mr. Overbury was knighted, and his father raiſed to the honour of being a Welſh judge. This was in the year 1608, and in the following year ſir Thomas made a tour on the continent, and on his return publiſhed "Obſervations on what he had ſeen." It was not likely that his principles ſhould be pure while connected with a licentious court; and accordingly it appears that he aſſiſted his friend and patron Carr, then lord Rocheſter, in his amorous correſpondence with the counteſs of Eſſex, but after her divorce, he as earneſtly oppoſed the marriage of the two adulterers, for which he incurred the hatred of them both. An attempt was now made to remove ſir Thomas to a diſtance from the court by appointing him to a foreign embaſſy, but he refuſed compliance; and upon the ground of his refuſal to undertake the king's ſervice he was committed to the Tower in April 1612, and all acceſs of his friends was denied him. Carr not only prevented the effect of every application for Overbury's releaſe, but is ſaid, by his own warrant, to have continued the ſtrictneſs of his impriſonment, contrary to the uſual practice in ſuch caſes. By his procurement, and that of his counteſs, poiſon was adminiſtered to him while a priſoner, and he died in extreme torture on the 15th of September 1613. Two years afterwards the circumſtance of Overbury's death was diſcovered, the accomplices in the horrid murder were tried, and the lieutenant of the Tower, with ſeveral others, were condemned and executed. Carr and the lady, at that time the earl and counteſs of Somerſet, were alſo convicted and condemned, but were pardoned. Sir Thomas, though by no means a blameleſs character, was lamented as a victim to the paſſions of a moſt abandoned pair. He was author of ſeveral pieces in proſe and verſe. The poem entitled "The Wife," deſcribing the character of a woman qualified to render the marriage ſtate happy, was extremely popular. The tenth edition of his works was publiſhed in 8vo. in 1753. Biog. Britannica. In this work there is a long and very detailed account of the methods uſed to deſtroy ſir Thomas Overbury.

OVER-CAST-STAFF, is a ſcale or meaſure, uſed by ſhipwrights, to determine the difference between the curves of thoſe timbers which are placed near the greateſt breadth, and thoſe which are ſituated near the extremities of the keel, where the floor riſes and grows narrower.

OVER-DONE, in the *Manege*, in French, *outré*. A horſe is ſaid to be over-done, or *outré*, when his wind and ſtrength are broke and exhauſted with fatigue.

OVER-FALL, or TUMBLING-BAY, in *Geography*, is a part of the ſide of a canal, or reſervoir, over which the water runs away, or eſcapes, when it is too high.—Alſo, the upper gates or ſluices of opening weirs are called *over-falls*.

OVERFLAKEE, OVER-FLACQUEE, or *Zuidvorn*, an iſland of Holland, on the Meuſe, about 13 miles long from E. to W., and four in its greateſt breadth. The firſt name it derived from a ſand-bank, called "Flacque" or "Flakee," which lies in the ſtream N. of the iſland, and the laſt from its ſituation with reſpect to the iſle of Voorn, from which it is about two miles diſtant to the ſouth. N. lat. 51° 43'. E. long. 4° 24'

OVERFLAX, a town of Sweden, in the government of Waſa; ſix miles N. of Waſa.

OVER-FLOWING, or INUNDATION *of Land*. See IRRIGATION, *Flooding of* LAND, and WATERING *of Land*.

OVER-GROWN, in *Sea Language*. When the waves of the ſea grow high, the ſailors call it *rough ſea*; but when the ſurges and billows grow vaſtly high, then it is an *over-grown ſea*

OVER-HANGING, in *Ship Building*, projecting over; as the ſtern is ſaid to overhang when it rakes much.

OVER-HAUL, in *Sea Language*. A rope is ſaid to be over-hauled, when drawn too ſtiff, or hauled the contrary way.

OVER-HAUL *the Runner*. See RUNNER.

OVER-HAUL *the Sheet*. See SHEET.

OVER-HAULING denotes the act of opening and extending the ſeveral parts of a tackle, or other aſſemblages of ropes, communicating with blocks or dead-eyes. It is uſed to remove thoſe blocks to a ſufficient diſtance from each other, that they may be again placed in a ſtate of action, ſo as to produce the effect required.

OVER-HAULING is alſo vulgarly expreſſed of an examination or inſpection into the condition of a perſon or thing.

OVERISSEL, in *Geography*, a department of Holland, which was one of the ſeven united Dutch ſtates, bounded on the N. by Groningen and Freiſland, on the E. by the biſhopric of Munſter and county of Bentheim, on the S. by Guelderland, and on the W. by the Zuyder See. The ſoil, except towards the W., where are ſome corn-lands and paſtures, is generally marſhy and productive of heath; the land is moſtly common without incloſure, and without aſcertained property. Near the river, however, are ſome incloſed meadows, which yield good hay. The whole country is flat and low, excepting merely a ridge which runs through it from N. to S. It is divided into three diſtricts, *viz.* Salland, Twent, and Vollenhoven; to which may be added Drent dependent upon it. The principal towns are Deventer, Campen, Zwol, and Vollenhoven, with Aſſen and Coverden in Drent. The chief rivers are the Iſſel and Vecht.

OVER-LAND FARM, in *Agriculture*, a provincial word uſed to ſignify a parcel of land without a houſe to it.

OVER-LAUNCH, in *Ship Building*, to run the butt of one plank to a certain diſtance beyond the next butt above or beneath it, in order to make ſtronger work.

OVER-LAYING *of Children*, may be prevented by a machine called *arcuccio*.

OVER-MASTED, in *Sea Language*, denotes the ſtate of a ſhip, whoſe maſts are too high, or too heavy for the weight of her hull to counterbalance.

OVER-RAKE. When a ſhip, riding at anchor, ſo over-beats herſelf into a head-ſea, that ſhe is waſhed by the waves breaking in upon her; they ſay, the waves over-rake her.

OVER-REACH, in the *Manege*, is when a horſe ſtrikes his hind-feet againſt his fore. The

The word is alſo uſed for a ſtrain, or painful ſwelling, of the maſter-ſinew of a horſe; occaſioned by ſuch over-reach.

OVER-RIDE, the ſame with over-done.

OVER-RULING *an Objection*, in *Law*, is the rejecting or ſetting it aſide by the court.

OVER-RUNNING, among *Printers*. See PRINTING, and CORRECTION.

OVERSAMESSA, an ancient fine or penalty, impoſed before the ſtatute of hue and cry, on ſuch perſons, as, hearing of a robbery or murder, did not purſue the malefactor.

OVERSEERS *of the Poor*, are public officers, who muſt be ſubſtantial houſeholders, (under which relative term day-labourers may be comprehended, if there be no other perſon to ſerve, and they muſt be generally reſident in the pariſh,) created by the ſtat. 43 Eliz. cap. 2. and nominated yearly in Eaſter week, or within one month after Eaſter (though a ſubſequent nomination will be valid) under the hand and ſeal of two or more juſtices of the peace in the ſame county, and dwelling in or near the pariſh whereof one to be of the quorum, who muſt meet together for this purpoſe; to provide for the poor of every pariſh; and are ſometimes two, or three, or four, according to the largeneſs of the pariſh: but not more than four nor leſs than two can be appointed. By 17 Geo. II. c. 38. in every townſhip or place where are no churchwardens, the overſeers alone may act in all reſpects as churchwardens and overſeers may do in other places by virtue of this or any former act; and if any overſeer ſhall die, or remove, or become inſolvent, before the expiration of his office, two juſtices (on oath thereof made) may appoint another in his ſtead; and if in any place there ſhall be no ſuch nomination of overſeers, as is before appointed, every juſtice of the diviſion ſhall forfeit 5*l.* to the poor of ſuch place, to be levied by the churchwardens and overſeers, or one of them, by diſtreſs by warrant from the ſeſſions. (43 Eliz. c. 2.) This forfeiture ſuppoſes that the juſtices are obliged to divide, for in that caſe the appointment was to be by the juſtices in or near the diviſion, and not otherwiſe; but now the juſtices at large are all equally concerned; and therefore it ſeems, that this penalty cannot be levied on any particular juſtice. But if, in any place, no overſeer ſhall be appointed, a mandamus will go to the juſtices at large, to compel them to appoint. Pariſhioners, as well as overſeers appointed, may appeal to the ſeſſions againſt the appointment. (17 Geo. II.) Overſeers refuſing to take the office may be indicted for it; nor will the court quaſh an indictment againſt an overſeer. The overſeers thus appointed, and taking upon them the office, ſhall, within fourteen days, receive the books of aſſeſſment and accounts from their predeceſſors, and what money and materials ſhall be in their hands, and reimburſe them their arrears. 17 G. II. cap. 28.

Their office and duty, according to ſtat. 43 Eliz. are principally theſe: firſt, to raiſe competent ſums for the neceſſary relief of the poor, impotent, old, and blind, and ſuch as are not able to work; and, ſecondly, to provide for ſuch as are able, and ſuch as cannot otherwiſe get employment: but this latter part of their duty, which, according to the wiſe regulations of that ſalutary ſtatute, ſhould go hand in hand with the other, is now moſt ſhamefully neglected. However, for theſe joint purpoſes, they are empowered to make and levy rates upon the ſeveral inhabitants of the pariſh, by the ſame act of parliament, which has been farther enforced and explained by ſeveral ſubſequent ſtatutes. (See RATE.) And by 17 Geo. II. cap. 38. if any perſon ſhall be aggrieved by any thing done or committed by the churchwardens and overſeers, or by any of his majeſty's juſtices of the peace, he may, giving reaſonable notice to the churchwardens or overſeers, appeal to the next quarterly ſeſſions, when the ſame ſhall be heard and finally determined: but if reaſonable notice be not given, then they ſhall adjourn the appeal to the next quarter ſeſſions; and the court may award reaſonable coſts to either party. By 43 Eliz. c. 2. the churchwardens and overſeers ſhall, within four days after the end of their year, and other overſeers nominated, make and yield up to two juſtices (1 Q.) a true and perfect account of all ſums by them received, or rated and aſſeſſed and not received, and alſo of ſuch ſtock as ſhall be in their hands, or in the hands of any of the poor to work, and of all other things concerning their office; and ſuch ſums of money as ſhall be in their hands ſhall pay and deliver over to their ſucceſſors: And the ſubſequent churchwardens or overſeers, by warrant from two ſuch juſtices, may levy by diſtreſs and ſale of the offender's goods the ſaid ſums or ſtock which ſhall be behind on any account to be made; and in defect of ſuch diſtreſs, two ſuch juſtices may commit him to the common gaol, there to remain without bail or mainprize, until payment of the ſaid ſum and ſtock: And alſo any ſuch two juſtices may commit to the ſaid priſon every one of the ſaid churchwardens and overſeers, which ſhall refuſe to account, there to remain, without bail or mainprize, until he have made a true account, and ſatisfied and paid ſo much as upon the ſaid account ſhall be remaining in his hands.

And by the 17 G. II. c. 38. it is enacted as follows: The churchwardens and overſeers ſhall yearly, within fourteen days after other overſeers ſhall be appointed, deliver in to the ſucceeding overſeers a juſt account in writing, fairly entered in a book to be kept for that purpoſe, and ſigned by them, of all ſums by them received, or rated and not received; and alſo of all materials that ſhall be in their hands, or in the hands of any of the poor to be wrought, and of all money paid by ſuch churchwardens and overſeers ſo accounting, and of all other things concerning their office; and ſhall alſo pay and deliver over all ſums of money and other things, which ſhall be in their hands, to the ſucceeding overſeers; which account ſhall be verified by oath before one juſtice, who ſhall ſign and atteſt the taking of the ſame at the foot of the account, without fee: and the ſaid books ſhall be preſerved by the churchwardens and overſeers in ſome public or other place within the pariſh or townſhip; and they ſhall permit any perſon aſſeſſed, or liable to be aſſeſſed, to inſpect the ſame at all ſeaſonable times, paying 6*d.* for ſuch inſpection; and ſhall, upon demand, give copies at the rate of 6*d.* for every three hundred words, and ſo in proportion. And if they ſhall refuſe or neglect to make and yield up ſuch account verified as aforeſaid, within ſuch time, or ſhall refuſe or neglect to pay over the money and other things in their hands; any two juſtices may commit them to the common gaol, till they ſhall have given ſuch account, or ſhall have paid and yielded up ſuch money and other things in their hands as aforeſaid.

And if any overſeer ſhall remove, he ſhall, before his removal, deliver over to ſome churchwarden or other overſeer his accounts verified as aforeſaid, with all aſſeſſments, books, papers, money, and other things concerning his office; and if any overſeer ſhall die, his executors or adminiſtrators ſhall, within 40 days after his deceaſe, deliver over all things concerning his office to ſome churchwarden or other overſeer, and ſhall pay out of the aſſets all money remaining due, which he received by virtue of his office, before any of his other debts are paid. 17 Geo. II. c. 38.

In caſe of an overſeer becoming a bankrupt, the balance of

of his account is not due till fourteen days after his year is expired.

Overſeers, neglecting their duty, ſhall forfeit for every default 20*s.* to the poor, to be levied by diſtreſs, or be committed to the common gaol. (43 Eliz.) And by 17 Geo. II. any pariſh officer, neglecting to obſerve the directions of that act, ſhall forfeit on conviction, within two calendar months after the offence committed, a ſum not exceeding 5*l.* nor leſs than 40*s.* to the poor, by diſtreſs. By 33 Geo. III. c. 55. neglect of duty or diſobedience to any lawful warrant or order of any juſtice, by any overſeer of the poor or other pariſh officer, upon complaint on oath, ſhall incur a fine, impoſed by two juſtices at any ſpecial or petty ſeſſions, not exceeding 40*s.*, to be levied by diſtreſs, and applied to the uſe of the poor. Overſeers are indemnified in the performance of their duty by 43 Eliz. 1. Jac. c. 5. and 21 Jac. c. 12. the benefit of which latter ſtatute is extended by 26 Geo. II. c. 44.

Churchwardens by 43 Eliz. are called overſeers of the poor, and they join with the overſeers in making a poor rate, &c. But the churchwardens having diſtinct buſineſs of their own, uſually leave the care of the poor to the overſeers only; though anciently they were the ſole overſeers of the poor.

It ſeems not to have been determined whether a juſtice of the peace may be appointed overſeer. But it appears to be a prevalent opinion, that the offices of juſtice of the peace and overſeers of the poor are incompatible, becauſe the accounts of the latter were ſubject to the controul of the former.

By 1 W. & M. c. 18. Diſſenting teachers, qualifying themſelves according to the Toleration act, are exempted from being choſen or appointed to ſerve as overſeers. By 18 Geo. II. c. 15. freemen of the corporation of ſurgeons in London are alſo exempted; ſo is an alderman of London. The ſame is the caſe with reſpect to attornies and practiſing barriſters. It ſeems alſo that a clergyman is not liable to ſerve the office of overſeer, even though he have no cure of ſouls. An officer of the cuſtoms is alſo exempted; and it is ſaid, in Gibſon's Codex, 215, that all peers of the realm, by reaſon of their dignity, all clergymen, by reaſon of their order, and all parliamentary men, by reaſon of their privilege, are exempted from the office of churchwardens. See Poor.

OVER-SET, or Over-throw, in the *Sea Language*. A ſhip is ſaid to over-ſet when her keel turns upwards; which misfortune happens either by bearing too much ſail, or by grounding her, ſo that ſhe falls upon one ſide.

OVER-SWEAT, in *Agriculture*, a term ſometimes applied to hay-ſtacks, when they ſweat too much, ſo as to be liable to burn.

OVERT Act, a term in *Law*, ſignifying an *open act*; or an act capable of being manifeſted and proved.

The word is formed from the French *ouvert*, *open*.

In which ſenſe it is diſtinguiſhed from an *intentional act*. See Treason.

Overt *Market*. See Market.

Overt-*Pound*. See Pound.

Overt-*Word* denotes a plain open word, not to be miſtaken.

OVERTON, in *Geography*, a ſmall market-town and pariſh in the hundred of Overton, Kingſclere-diviſion, of the county of Southampton, England, is ſituated on the great weſtern road, at the diſtance of three miles E.N.E. from Whitchurch, and fifty-four miles W.S.W. from the metropolis. It was formerly a borough, and ſent two members to parliament, but loſt this privilege by neglect. The market day here is Monday, weekly, and there are three fairs during the year. The church is a neat building, ſeated on an eminence about a quarter of a mile from the centre of the town. This pariſh contains the tythings of Pollhampton, Quidhampton, and Southington; and is watered by a fine trout ſtream, which drives a ſilk mill, and ſeveral corn mills within the limits of the pariſh. Large quantities of malt are made here and in the adjoining villages. According to the population returns of 1811, the houſes in this pariſh were computed at 231, and the inhabitants at 1178, in number.

OVERTURE, in *Muſic*, the ſymphony in theatres, which immediately precedes the drawing up the curtain. It uſed to be called in France an *entrée*, and rendered as ſpirited, impoſing, and full of harmony, as poſſible. In Lock's Engliſh operas it is called a *curtain tune*.

French overtures, and indeed the firſt movements of thoſe of Handel, were almoſt all in the ſtyle of Lulli. They move in a ſpaſmodic and convulſive manner, bordering on bombaſt. Lulli's overtures have a ſlight fugue, always in triple time, after the opening, but no air. So that the overtures of Handel have no reſemblance to thoſe of Lulli but in the firſt movement; the ſecond is almoſt always an excellent fugue terminated by a pleaſing air in minuet, gavot, or jig time.

"There was a time when French overtures ſerved as models for all Europe. Sixty years have not elapſed, (ſays Rouſſeau,) ſince overtures were ſent for from France to place at the head of the Italian operas. I have even ſeen many ancient Italian operas in ſcore, with an overture by Lulli at its head. The Italians like not to hear this at preſent, but ſuch is the fact.

"Inſtrumental muſic having made an aſtoniſhing progreſs within theſe 40 years, (in 1768,) the old overtures made for performers not very well acquainted with the finger-board or the powers of their inſtrument, have been abandoned to the French, and they have continued to perſevere in them in their priſtine ſtate, without change or innovation. The Italians, impatient to ruſh forward in the road to fame, emancipated themſelves from gallic chains in muſic, however patiently they may have ſubmitted to political chains ſince, and compoſed overtures upon a different plan, full of fire and ſpirit in the firſt movement; in the ſecond generally a graceful and captivating *andante*, *ſampre piano*, in which they diſplay all the graces of a beautiful melody, &c.; laſtly, a brilliant *allegro*, commonly in $\frac{2}{3}$. The overture of this tune only acted as a crier of the court to enjoin ſilence by an *oyez*, by the time the curtain riſes, and the clattering of doors and ſtruggle for places ceaſe."

Overture *du livre*, or *à livre ouvert*, Fr., on the opening the book, at ſight; theſe are expreſſions applied to muſical ſtudents, or performers, who read muſic with as much facility as a newſpaper.

OVER-WORKED, in the *Manege*, is the ſame with over-done. It is called, in French, *eſtrapaſſer*.

OVER-WROUGHT, in *Rural Economy*, a term applied to horſes or other animals that are worked beyond their ſtrength.

OVER-YEARS, a provincial word applied to ſuch bullocks as are not finiſhed in fattening at three years old when home-breeds, or the firſt winter after buying in; but kept through the following ſummer to be finiſhed the next winter.

OVER-YSCHE, in *Geography*, a town of France, in the department of the Dyle, on the river Yſche; 10 miles S.E. of Bruſſels.

OUESSANT, or Ushant, an iſland in the Atlantic, belonging to France, about 10 miles in circumference, con-

taining ſeveral hamlets and a ſmall port, defended by a caſtle, and about 700 inhabitants; about 12 miles from the continent. N. lat. 48° 29'. W. long. 5°.

OUGEIN, Oogein, or *Oojein*, as variouſly ſpelled by different writers, is a city of India, the capital of the Mahratta chief Dowlut Rao Sindiah, in the province of Malwa, his hereditary territory. See Malwa.

This city is in many reſpects very intereſting, and our account of it will be ſomewhat particular, naturally dividing itſelf into a deſcription of the modern city, and a notice of the cataſtrophe, which at a remote period befel the ancient metropolis of Malwa. The preſent city of Oujein is of an oblong form, about ſix miles in circumference, and ſurrounded by a ſtone wall with round towers. Within this ſpace there is ſome waſte ground, but the inhabited part occupies by far the greateſt portion; it is much crowded with buildings, and is very populous. The houſes are built partly of brick, partly of wood. Of the brick houſes the frame is firſt conſtructed of wood, and the interſtices filled up with brick. They are covered either with lime, tarras, or with tiles. The principal bazar or market is a ſpacious and regular ſtreet, paved with ſtone. The houſes on each ſide are of two ſtories; the lower, to which you mount from the ſtreet by five or ſix ſteps, are moſtly built of ſtone, and is taken up with ſhops; the upper, of brick or wood, ſerve for the habitations of the owners.

The moſt remarkable buildings are four moſques, erected by private individuals, and a great number of Hindoo temples. Of the latter the moſt conſiderable is a little way out of the town, at a place called Unk-pat, held in great veneration, as being that where Kriſhna and his brother received the rudiments of their education. Here is a ſtone tank, with ſteps leading down to the water's edge, ſaid to be of great antiquity; but it has been of late years encloſed with a ſtone wall, and two temples have been erected within the incloſure. Theſe temples are ſquare, with pyramidal roofs. That on the right, as you enter the gate, contains the images of Rama, Lakſhiman, and Sita, in white marble; and that on the left, thoſe of Kriſhna and Radha, the firſt in black, the ſecond in white marble. All theſe figures are well executed. An account of theſe mythological perſonages is given in this work under their reſpective names.

Sindiah's palace in the city is an extenſive and ſufficiently commodious houſe, but without any claim to magnificence; and it is ſo cloſely ſurrounded by other buildings, as to make but little appearance on the outſide. Near it is a gate, the only remains of a fort, ſaid to have been built ſoon after the overthrow of the ancient city, which affords a good ſpecimen of the old Hindoo architecture.

Within the city, and near the eaſtern wall, is a hill of a conſiderable height, on the top of which is a Hindoo temple of Mahadeva, and adjoining to it the tomb of a Muſſulman ſaint. This hill is conſpicuous from a diſtance, and a ſpectator from the top of it commands an extenſive proſpect on every ſide. To the northward he ſees, at the diſtance of four miles, the rude and maſſy ſtructure of Kalideh, or Calydeh, an ancient palace, built on an iſland in the river Sipparah, by a king of the family of Gour. A deſcription of this extraordinary fabric is inſerted in the Oriental Repertory, vol. i. p. 266, from a letter of ſir C. W. Malet, dated Oujein, 13th of April 1785. By an extract from a hiſtory of Malwa, or Malava, theſe buildings appear to have been conſtructed by, or in the reign of, ſultan Naſir ud-deen Gilgee, who aſcended the throne of Malava in the year of the Hegira 905 (A.D. 1500), and reigned eleven years. Theſe ſingular buildings, we may judge from their name, were erected or conſecrated to the honour of Kali, conſort of Mahadeva, (ſee thoſe articles,) to whom the temple on the hill within the city appears above to be dedicated. Theſe are two ſquare buildings, each covered with a hemiſpherical cupola, and divided below into eight apartments, beſides the ſpace in the centre. The communication to the iſland is by a ſtone bridge over one of the branches into which the river Sipparah is here divided. Below the bridge are ſeveral apartments conſtructed on a level with the water; and the rocky bed of the river is cut into channels of various regular forms, ſuch as circles, ſpirals, ſquares, &c. to which, in the dry ſeaſon, the current is confined. Turning to the weſtward, the ſpectator, from the top of the hill above-mentioned, traces the winding courſe of the Sipparah through a fertile valley, where fields of corn and clumps of fruit trees interſecting, diverſify the proſpect, till his attention is arreſted by the fort of Beiroungurh ſituated cloſe on the oppoſite bank. It is about a quarter of a mile in length, ſurrounded by a rampart of earth, and contains an ancient temple, dedicated to the tutelar divinity of the place, whoſe name it bears. Beiroungurh means the fort of Beiroun, or Bheroo, a Mahratta pronunciation of Bhairava, the offſpring of Mahadeva. In the Sanſcrit language Bhairava means *tremendous*. Still farther up the ſtream, and nearly oppoſite to the middle of the town, are the gardens of two Mahratta nobles, containing the luxuries of nature with extenſive artificial decorations. Beyond theſe, at the diſtance of half a mile from the river, is a grove of trees on a riſing ground. It contains the tomb of a Mahomedan ſaint; and is remarkable for having been the ſcene of a bloody action, fought about the year 1762, between Sindiah and one of his rebellious officers, named Raghu, who marched to Oujein at the head of thirty thouſand men to attack his ſovereign with only five or ſix thouſand. With this inequality the fight began on the plain near the tomb above-mentioned, but Sindiah was joined by a party of ſix thouſand Goſains, (religious mendicants,) and a chance ſhot killing Raghu, the rebel party was wholly routed.

The proſpect on this ſide is bounded by a ridge of hills, at the diſtance of about three miles. It runs N.N.E. and S.S.W. and is ſeven miles in length. Theſe hills are chiefly compoſed of granite, and from them the ſtone employed in building is ſupplied; but they are covered with vegetable mould to a ſufficient depth to admit of cultivation. To the S.W. is a wide avenue of trees, which terminates a courſe of two miles, at a temple of Ganeſa, (a mythological ſon of Mahadeva, ſee Pollear,) ſurnamed Chintamun. It is viſited by numerous proceſſions at ſtated periods.

The ſouth wall of Oujein is waſhed by the Sipparah, which here makes a ſudden turning. This extremity of the city is called Jeyſing-poora, that is, the quarter of Jeyſing, and contains an obſervatory, built by the enlightened and liberal rajah of that name. He alſo built obſervatories at four other cities, *viz.* at Ambheer, his own capital, (ſince named from him Jeynagar,) Matra, Benares, and Dehli. He publiſhed, in 1728, a ſet of aſtronomical tables, which, in compliment to the then reigning emperor, he entitled Zij Mahommedſhahy. Of theſe five obſervatories, and the aſtronomical tables, and labours in that ſcience, of this illuſtrious prince the rajah Jeyſing, (or more correctly Jayaſinha,) a learned and very intereſting account is given in vol. v. of the Aſiatic Reſearches, by Dr. W. Hunter, from whoſe "Narrative of a Journey from Agra to Oujein," in vol. vi. of that work, this article is chiefly taken. See Observatory.

Turning to the left, we are preſented with a different proſpect.

proſpect. As far as the eye can reach is a level plain, which is only interrupted by a conical hillock, at the diſtance of three miles; beyond which is an extenſive lake, that lies cloſe on the road that leads to Bopal. On the right of the road, at the ſame place, is a park belonging to Sindiah, well ſtocked with deer.

The rajah Jeyſing held the city and territory of Oujein of the emperor, in quality of ſubahdar; but it ſoon after fell into the hands of the Mahrattas, and has belonged to the family of Sindiah for three generations (1813.) The diſtrict depending immediately on the city yields a revenue of five lacks of rupees (60,000*l.*) *per annum*, and comprehends 175 villages.

The officers of government are almoſt the only Mahratta inhabitants of Oujein. The bulk of the people, both Hindoos and Muſſulmans, ſpeak a dialect very little different from that of Agra and Dehli. The Muſſulmans form a very conſiderable portion of the inhabitants, and of theſe the tribe of Bohrah amount to about 1500 families. This ſingular tribe forms a large ſociety in moſt of the cities and large towns of Hindooſtan and the Deccan. Surat is ſaid to contain 6000 families. The head-quarters of the tribe are Burhanpoor, where their moulla or high prieſt reſides. A younger brother of the moulla reſides in Oujein. They exerciſe both a temporal and ſpiritual authority over their ſect, which forms the moſt uſeful and induſtrious claſs of the inhabitants.

The ſoil in the vicinity of Oujein, and indeed over the greateſt part of the province of Malwa, is a black vegetable mould, which, in the rainy ſeaſon, becomes ſo ſoft, that travelling is hardly practicable. On drying, it cracks in all directions, and the fiſſures are ſo wide and deep in many parts by the road-ſide, that it is dangerous for a traveller to go off the beaten tract; as a horſe, getting his foot into one of theſe fiſſures, endangers his own limbs, and the life of the rider. The quantity of rain that falls in ordinary ſeaſons is ſo conſiderable, and the ground ſo retentive of moiſture, that wells are rarely uſed for agricultural irrigation. A great part of the labour, incident to cultivation in other parts of India, is thus ſaved. But this very circumſtance makes the ſuffering more ſevere, on a failure of the periodical rains: for the huſbandman, accuſtomed to depend on the ſpontaneous bounty of heaven, is unprovided with wells, and is with difficulty brought to undertake the unuſual labours of irrigation, eſpecially as they muſt commence with digging the ſources.

There are, as in Hindooſtan, two harveſts in Malwa; the firſt in March and April, the ſecond in September and October. Wheat, peaſe, and various ſorts of vetches, ripen in the firſt. Barley is not cultivated, nor rice, otherwiſe than in ſmall detached low ſpots. Grapes are abundant. Oujein is firſt ſupplied from Burhanpoor, a very large and flouriſhing town, more than 100 miles to the ſouthward.

By the time the Burhanpoor grapes are exhauſted, in April, thoſe of Oujein ripen, but are inferior to the former. The vines produce a ſecond crop in the rainy ſeaſon, but of an acidulous and much inferior grape. The other fruits are the mango, guava, plantain, melon, water melon, two ſpecies of annona (ſquamoſa and reticulata), ſeveral varieties of oranges and limes, the falſah (Grewia aſiatica), from which is made a moſt refreſhing ſherbet, ſlightly acidulous.

The principal articles of export trade are cotton, which is ſent in large quantities to Guzerat for the Bombay and China market, coarſe printed cloths, and opium. From Bombay, through Surat, are received various kinds of Europe and China goods, many of which are ſometimes to be purchaſed cheaper in Oujein than in the Engliſh ſettlements; alſo pearls, which are partly uſed here, and partly forwarded to Hindooſtan. Aſafœtida, which is produced in Sind and provinces beyond it, comes hither on its way to the eaſtward, to Mirzapoor, &c.; and diamonds, from Bundelcund to Surat.

The following obſervations on the weather at Oujein were made by Dr. Hunter in 1792. In the months of April and May, the winds in the day-time were ſtrong and hot; the thermometer expoſed to them being from 93° to 109°, at P.M. Theſe winds, with little deviation, come from the weſtward. The heat at 9 P.M. varied from 80° to 90°. The mornings were more temperate, in one inſtance only riſing ſo high as 81°, and ſometimes being as low as 69°. From the 18th to the 25th of May, we had frequent ſqualls from the N.W. and W.N.W.; once from N.E., with thunder, lightning, and rain. The quantity of rain that fell in this time was about 10 inches. This weather is not uſual at this ſeaſon: it produced a temporary coolneſs; but the ſky clearing up before the end of the month, the air returned to its former temperature, and even exceeded it, for the morning heat now ſometimes roſe to 85°.

On the 11th of June, the rains ſet in, and the quantity that fell during the ſeaſon was as follows:

| | | |
|---|---|---|
| May, as above, about | 10 inches, | rained 5 days. |
| June, | 3.521 | 9 |
| July, | 12.071 | 22 |
| Auguſt, | 21.088 | 22 |
| September, | 5.651 | 9 |
| | 52.331 | 67 |

The rain terminated on the 14th of September. From the middle of June to the middle of July, the afternoon heat varied from 107° to 86°, gradually diminiſhing as the ſeaſon advanced, and ſometimes, from the continuance of the rain, was as low as 80°. The morning was more uniform; its extremes being between 87° and 77°; the evening between 90° and 75°. The weather during this period was conſtantly cloudy, ſometimes hazy; wind uniformly from the weſtward, ranging from N.W. to S.W.

From the middle of July to the termination of the rains, the afternoon heat was from 89° to 74°. The limit between the two periods was ſtrongly marked; July the 15th at P.M. being 91°, and on the next day, at the ſame time, 78°; the morning from 80° to 72°. During this period, the clouds were ſo heavy, and ſo uniformly ſpread over the face of the heavens, that the ſun could ſeldom dart a ray through the gloom. The rain was frequent, and long continued, but ſeldom heavy. The only inſtance in which the rain of one day amounted to ſo much as three inches was between 7 P.M. of the 15th of Auguſt, and 9½ A.M. of the 16th. During this period of 26½ hours, the rain was inceſſant, and the quantity amounted to 10.128 inches. It then abated, but did not ceaſe till the 17th, at 4 P.M.: the quantity in that interval was 0.629. So great a fall of water cauſed a deſtructive inundation. The waters continued to riſe till the 16th at midnight, and then gradually ſubſided; but it was ſeveral days before the river was fordable by men or horſes.

During the rainy ſeaſon, the prevailing wind is weſterly, ranging from N.W. to S.W.; a few times light winds from the S. and from the E.

After the rains were over (14th September), the ſky cleared up, and the mid-day and afternoon heat increaſed. By the 23d, it was 92°; October 1ſt, 101°; and till the middle of November, was ſeldom under 90°. The morn-

ing heat, during that period, gradually decreaſed from 73° to 46°; the evening from 79° to 57°. The dew latterly very heavy.

The winds continued for two days (14th and 15th Sept.) at W. To the end of the month calm, or light airs from the N.E. To the middle of October, winds of moderate force from the N.W. prevailed; but with frequent calms. N.E. to the end of the month, with hazy mornings. All October there was not a cloudy day. In November, till the 6th, weſterly was the reigning wind; to the 15th the N.E. recovered its prevalence; to the 8th the days were hazy; on the 4th a little rain fell. For the next week the ſky was clear. At this time this accurate obſerver (Dr. Hunter) was ſeized with a fever, which ſuſpended his meteorological remarks till the 1ſt of February. All he could notice was ſtormy weather about the middle of December, with thunder and a pretty heavy fall of rain.

From the 1ſt of February to the 14th of March, when Dr. Hunter left Oujein, the afternoon heat varied between 73° and 103°. The firſt on the 9th February with wind at N.N.W.; the higheſt 12th March, wind W. ſky at both times clear. Morning heat from 46° to 67°; evening from 55° to 76°.

The weſterly were the prevailing winds during this period, ranging from N.N.W. to S.S.W. In February an eaſterly wind was obſerved twice in the morning, four times at midday, and twice in the evening. It did not occur again to the 14th of March. A ſmall ſhower of rain fell on the 4th of February, and this was the only cloudy day during the period in queſtion.

The foregoing abſtract gives a pretty clear idea of the weather at Oujein for a year. But we are cautioned by the author of it not to conſider it as an exact eſtimate of the weather uſually experienced there. The quantity of rain, in particular, he repreſents as far exceeding the uſual fall. On this we have to obſerve, that although for a day and night, as particularly mentioned, the fall was, indeed, exceſſive, yet for the whole period of the rainy ſeaſon, we do not conſider the depth given as any *very* exceſſive or unuſual fall. This we ſay on the authority of ſome meteorological journals in MS. to which we have had acceſs, and with which we have compared Dr. Hunter's. The degree of extreme heat, too, is greater than we have noticed elſewhere, in the weſtern parts of India in the rainy ſeaſon. Making ſome abatement on theſe two items (the fall of water and the extreme of heat), we are diſpoſed to think the above a fair ſpecimen of the climate of the weſtern parts of India above the Ghauts, from Oujein to Seringapatam. It muſt be recollected, however, that the rains uſually ſet in about a month earlier in the ſouthern, than in the northern parts of that range. Fevers, chiefly intermittent, prevailed at Oujein toward the end of the rains, and increaſed in frequency till the middle of November. Theſe were imputed to local and temporary cauſes; and the only endemic obſerved by Dr. Hunter, was the dracunculus, or Guinea worm.

The ſituation of this city is of importance, as it is conſidered as the firſt meridian by Hindoo geographers and aſtronomers. (See LANKA.) By the medium of eleven obſervations of Jupiter's firſt and ſecond ſatellites, Dr. Hunter determined its long. to be 75° 51′ E. from Greenwich. Its lat. by a med. of eight obſ. he made 23° 11′ 13″ N. It may be roundly reckoned about 300 miles N.E. from Surat, ſomething more ſouth from Agra. Indore, the capital of the Mahratta family of Holkar, is about 20 miles in a ſoutherly direction, and Bopal (properly Bhùpàla) about 100 to the eaſtward. The laſt named is a flouriſhing town and diſtrict, ruled by a Mahommedan government and dynaſty, in a manner apparently more independent of the Mahrattas, than is uſual in towns or diſtricts ſimilarly ſituated. We ſhall conclude this lengthened account of the modern city of Oujein, by obſerving, that during the military operations carried on under the adminiſtration of the marquis Welleſley, againſt the Mahratta confederates, the Bombay army, under general ſir John Murray, took poſſeſſion of both Indore and Oujein. But although we retained the latter city for ſome months, we have not heard of any literary reſult from our poſſeſſing ſo curious and intereſting a ſpot. It ſeems to be within the reach of the literary ſocieties both of Calcutta and Bombay, and conſidering our extended connection and intercourſe with the Durbar, and country of Dowlut Rao Sindiah, a reaſonable hope may be entertained of due notice being attracted to a ſpot promiſing ſo abundant a recompence to well-directed enquiry and reſearch.

The ancient city of Oujein was ſituated about a mile to the northward, and now lies, and has for many centuries lain, buried in the earth to the depth of from fifteen to eighteen feet. On digging, its walls are ſaid to be found entire, pillars erect and unbroken, pieces of wood of extraordinary hardneſs, &c. The bricks thus dug up are now applied to the purpoſes of building, but are much larger than any made in the preſent or late ages. Utenſils of various kinds have been found, and ancient coins. Very little, however, has been yet done towards developing the preſent ſtate of this ſubmerged city; the intereſting Herculaneum of India. Dr. Hunter noticed a large quantity of wheat that was found while he was there; it was in a charred ſtate; a potter's kiln he alſo ſaw, filled with broken earthen veſſels. Tradition imputes the deſtruction of the city to a ſhower of earth, an idea likely to have originated in ſuperficial obſervation; for although Dr. Hunter obſerved no volcanic hills, nor ſcoria, in the neighbourhood, and thinks the ſtate and poſition of the walls and pillars militate againſt the ſuppoſition of an earthquake having effected the ſubmerſion of the city, it is here difficult to impute it to any other than a volcanic cauſe, operating, perhaps, with leſs violence and convulſion than have attended ſimilar phenomena in other countries, and combined with, or rather cauſing, an inundation of the river. A change in the courſe of the river is ſaid to have taken place at the time, and an ancient bed is now traceable. A deſtructive inundation was witneſſed and recorded by Dr. Hunter; and the writer of this article knows of another that occurred in a late rainy ſeaſon. It would appear that the neighbourhood of Oujein is particularly ſubject to inundation, and when the looſe friable nature of the ſoil be conſidered, it ſeems moſt reaſonable to reſort to an alluvial hypotheſis to account for the ſubmerſion of the ancient city. But whatever may have been the real cauſe of the cataſtrophe, it cannot be ſuppoſed that the wild fancies of Hindoo hiſtorians would ſuffer the fact to be ſimply told. It muſt be dreſſed up in a mythological allegory. In fable or fact the interventions of the gods cannot be diſpenſed with. The following ſtory is accordingly related.

A certain Gandharva, or celeſtial choriſter, was condemned for an affront to the god Indra, to be born on earth in the ſhape of an aſs; but on entreaty the ſentence was mitigated, and he was allowed at night to aſſume the form and functions of a man. This incarnation took place at Oujein in the reign of rajah Sadaſvaſena, whoſe daughter was demanded in marriage by the aſs; and his conſent was obtained, on learning the divine origin of his intended ſon-in-law, confirmed, as he witneſſed, by certain prodigies. All day he lived in the ſtables like an aſs; at night, ſecretly ſlipping out of his ſkin,

ſkin, and aſſuming the appearance of a handſome and accompliſhed young prince, he repaired to the palace, and enjoyed the converſation of his beauteous and happy bride.

In due time the princeſs became pregnant; and her chaſtity being ſuſpected, ſhe revealed to her inquiſitive parents the myſtery of her ſpouſe's delectable nocturnal metamorphoſis; which the rajah, (or by other accounts the mother,) being conveniently concealed, himſelf beheld; and unwilling that his ſon ſhould return to his uncouth diſguiſe, ſet fire to, and conſumed, the vacant aſſes' ſkin.

Rejoiced at his releaſe, for this event appears to have broken the ſpell, the incarnate Gandharva warned his beloved wife to quit the city, which he foreſaw was about to be overwhelmed with a ſhower of earth from the reſentment of Indra, thus diſappointed of his vengeance in the termination of the baniſhment of his inſolent ſervant. She fled accordingly to a village at a ſafe diſtance, and brought forth a ſon named Vikramaditya; and a ſhower of cold earth, poured down by Indra, buried the city and its inhabitants.

It may be here noticed that this fable, wild as it is, affords ſtill ſome confirmation of the ſuppoſition of an inundation during the rainy ſeaſon having deſtroyed the city. For Indra is the god of ſhowers, and ſuch an event would of courſe be attributed to the vengeance of the Jupiter Pluvius of the Hindoo Pantheon, in the ſame manner as we frequently find the caſe in the natural phenomena mythologized in the Iliad. See INDRA.

The ſeeming fable has, alſo, another feature of hiſtoric truth; for Vikramaditya, ſo diſtinguiſhed in his origin and birth, is no leſs ſo as a monarch and an aſtronomer. His name marks an era much uſed all over India, of which the 1869th year correſponds with 1813 of our's. Several monarchs of Malwa of this name are however recorded; and differences of opinion exiſt on ſome chronological points connected with this era. (See Aſ. Reſ. vol. ix. art. iii.) The Vikrama in queſtion is, however, particularly diſtinguiſhed by the ſurname of his putative parent, who is called Gardha-rupa, or the aſs-faced, and his era is hence to be aſcertained with more accuracy than is uſually obtainable on remote points of Hindoo chronology. He was the third Vikramaditya, and appears, by ſeveral hiſtorical coincidences, to have aſcended the throne of Malwa in the year of Chriſt 441. It hence appears that the city ſunk about 1400 years ago. The ſtory of the aſs, variouſly modified, is widely ſpread in the popular tales of India, Perſia, Turkey, Arabia, and other oriental countries, and has found its way even into the literature and legends of Europe.

The claſſical name of this city is Ujjaini, not materially altered in its preſent deſignations. It is alſo called Avanti in the Puranas, is much venerated by the Hindoos, and is one of the moſt celebrated for producing great and learned men among the cities of India. If Benares has been thought to deſerve the name of the Athens, Oujein may lay claim to the honour of being the Florence of Hindooſtan. From this circumſtance we have been induced to be more diffuſe than is uſual with us in like caſes, in our account of this city, which, and the legends connected with it, furniſh ample ſubjects for the deſcriptive and fabulous details of Puranic romance. From this ſource we ſhall notice one more tale, or rather a variation of that already given, accounting for one of the ancient names of the city; premiſing, however, that ſuch tales being found in the Puranas, fully prove thoſe books, a portion of them at leaſt, to have been written ſubſequent to the cataſtrophe that they deſcribe. See PURANA.

The varied legend to which we advert, ſays that the curſe having expired in the conſumption of his aſinine diſguiſe, the Gandharva aſcended to the heaven of Indra; and that his wife, reſolving to die, ripped open her belly, took out the child, and gave it to a *malini* (gardener's wife) to nurſe. She took it to Ujjaini, and from the ſignal preſervation of the child in that city, it obtained the name of Avanti, from the Sanſcrit *ava*, to preſerve. Kriſhna is ſtated to have been educated, and his friend Narada to have been born, in Avantipuri.

The city of Oujein appears evidently, both as to name and poſition, in the Periplus of the Erythrean ſea, as well as in Ptolemy, under the name of "Ozena."

OUGHTER LOUGH, a lake of the county of Cavan, Ireland, formed by an expanſion of the river Erne, which flows through it. The irregularity of its form, the large and beautiful iſlands it contains, and the many deep receſſes that wind between high banks and overhanging woods, produce a rich variety of intereſting and romantic ſcenery. It was in a ſmall iſland in this lake that good biſhop Bedel was confined by the inſurgents in the ſeventeenth century. Beaufort.

OUGHTERARD, a ſmall poſt-town of Ireland, in the county of Galway, ſituated on lough Corrib. The rocks here are of black and white marble. It is 120 miles W. by N. from Dublin, and nearly 14 miles N.W. from Galway.

OUGHTRED, WILLIAM, in *Biography*, an eminent mathematician, was born at Eton, in Buckinghamſhire, about the year 1573. He was educated in grammar learning upon the foundation of that ſchool, and was thence elected, in 1592, to King's college, Cambridge, of which he was afterwards admitted a fellow. Here he applied himſelf with great aſſiduity to the ſtudy of different branches of academical learning, and particularly that of mathematics. While an under-graduate, he invented "An eaſy method of geometrical dialling," which was not publiſhed before the year 1647, but was privately received with ſo much eſteem, that Mr. (afterwards ſir Chriſtopher) Wren, at that time a ſcholar of Wadham college in Oxford, immediately tranſlated it into the Latin language. In 1596 Mr. Oughtred was admitted to the degree of B.A., and in 1599 to that of M.A. About the year 1603 he was ordained prieſt, and preſented with the rectory of Aldbury, near Guilford, in Surry, upon which he quitted the univerſity, and reſided upon his living, diſtinguiſhing himſelf by the faithful and diligent diſcharge of his paſtoral duties. Here he led a retired and ſtudious life, ſeldom travelling ſo far as the metropolis, his principal recreation conſiſting in a diverſity of ſtudies. So high was his reputation for mathematical knowledge, that he obtained what number of pupils he pleaſed, and many of the chief mathematicians of that age owed much of their ſkill to him. He alſo maintained a correſpondence with ſome of the moſt eminent ſcholars of his time on mathematical ſubjects. In the year 1614, Mr. Briggs, profeſſor of geometry, having met with lord Neper's account of the invention of logarithms, and deſigning to perfect the plan, conſulted Mr. Oughtred upon the ſubject, who probably wrote his treatiſe "On Trigonometry" about this time, though it was not publiſhed till 1657. In proſecuting the ſame ſubject, he invented, not many years afterwards, an inſtrument called "The Circles of Proportion," by which all ſuch queſtions in arithmetic, geometry, aſtronomy, and navigation, as depended upon ſimple and compound proportion, might be worked; and it was the firſt ſliding-rule that was projected for thoſe uſes, as well as thoſe of gauging. In 1628 Mr. Oughtred was engaged by the earl of Arundel to become mathematical tutor to his ſon lord William Howard, and

and he drew up for the uſe of his noble pupil "Arithmeticæ in numero et ſpeciebus Inſtitutio; quæ tum Logiſticæ, tum Analyticæ atque adeo totius Mathematicæ quaſi Clavis eſt," which he publiſhed in 1631. This work, which was intended by the author to ſerve as a general key to the mathematics, was very favourably received both at home and abroad. An Engliſh tranſlation of it was publiſhed in 1647, under the title of "The Key of the Mathematics new forged and filed, &c." It went through ſeveral editions, and became a ſtandard work with tutors in the inſtruction of mathematical pupils at the univerſities, and ſome parts of it were made the ſubjects of the geometrical lectures at Greſham college. In a third edition of his Clavis, he added a treatiſe on the uſe of logarithms; a declaration of the tenth book of Euclid's Elements; a treatiſe of regular ſolids, and the theorems contained in the books of Archimedes. He did not think it neceſſary, nor of any advantage to geometry, abſolutely to confine the demonſtrations, in the ſublimer parts of ſcience, to the principles laid down in the Elements. On the contrary, in his expoſitions of the theorems of Archimedes on the ſphere and cylinder, he condemns the rigid ſtrictneſs of that author, which obliged him to make uſe of arguments ex abſurdo. Theſe he rejected, and aſſuming for a poſtulatum, that a circle is a plane, and a ſphere a ſolid figure having an infinite number of ſides, he gives, for the moſt part, affirmative and direct demonſtrations of thoſe theorems. Notwithſtanding all his mathematical merit, he was in danger, about the year 1646, of a ſequeſtration by the committee for plundered miniſters, ſeveral articles having been depoſed and ſworn againſt him; but upon the day of hearing, William Lilly, the famous aſtrologer, applied to all his friends, who appeared in ſuch numbers on his behalf, that though the chairman and many members were active againſt him, he was acquitted. He died in 1660, at the good old age of 86, and his death was ſaid to have been occaſioned by a ſudden exſtacy of joy, upon hearing the vote which was paſſed at Weſtminſter for the reſtoration of Charles II. He has been characteriſed "as facetious in Greek and Latin; as ſolid in arithmetic, aſtronomy, and the ſphere of all meaſures, muſic, &c.; exact in his ſtyle, as in his judgment; handling his cube, and other inſtruments at eighty, as ſteadily as others at thirty; owing, he ſaid, to temperance and archery; principling his people with plain and ſolid truths, as he did the world with great and uſeful arts; advancing new inventions in all things but religion, which, in its old order and decency, he maintained ſecure in his privacy, prudence, and contentment." He had a ſon, whom he put apprentice to a watchmaker, for whom he wrote a book of inſtructions in that art. He left behind him a great number of manuſcripts upon mathematical ſubjects, and moſt of his Greek and Latin books contained notes in his own hand writing, with a demonſtration of the propoſitions in the margin. Theſe books and manuſcripts came into the poſſeſſion of Mr. William Jones, father of the late ſir William Jones, and afterwards into the hands of ſir Charles Scarborough, the phyſician, who carefully ſelected thoſe that were fit for the preſs, and printed them in 1676, under the title of "Opuſcula mathematica hactenus inedita," 8vo. Biog. Brit.

OUGLY, in *Geography*, a town of Hindooſtan, in the circar of Sanore; 75 miles W. of Sanore.

OUGUELA, a town of Portugal, in the province of Alentejo; ſix miles S. of Albuquerque, in Spain. N. lat. 38° 54'. W. long. 6° 43'.

Ouguela, a town of Africa, in the territory of Tripoli. See Aguila.

OVI Albumen. See Albumen.

OVICULUM, in the *Ancient Architecture*, a little *ovum*, or egg.

Some alſo uſe the word *oviculum* for *ovolo*.

Baldus will have this to be the Leſbian aſtragal of Vitruvius. Daviler.

OVID, Publius Ovidius Naso, in *Biography*, a celebrated Roman poet, was born at Sulmo, the preſent Abruzzo, in the conſulate of Hirtius and Panſa, in the year 43 B.C. He was of an ancient equeſtrian family, and was ſent in his youth to Rome to be educated in liberal ſtudies under the beſt maſters: he ſhewed a propenſity to poetry at an early period of his life, and it was not without extreme difficulty, that his father could prevail on him to relinquiſh the culture of the Muſes for the thriving purſuits of the law. At length, however, he was prevailed on to ſet down to buſineſs, and he appears to have made good progreſs in forenſic eloquence and judicial knowledge, for he refers to ſome cauſes that he had pleaded with great ſucceſs; and he afterwards ſat as one of the triumvirs to whom criminal juriſdiction was committed. By the death of his brother he was probably no longer obliged to follow the law as a gainful profeſſion, deſerted the courts, and gave himſelf up to pleaſure and poetry. His talents and amiable qualities introduced him to the beſt ſociety in Rome. He was married three times; from the firſt two wives he was divorced, but he ſpeaks of his third, Perilla, with great affection, by whom he had a daughter, who adhered to him in all his fortunes, and who is thought to have ſurvived him. He ſeems to have lived at his eaſe and in affluence, poſſeſſing a houſe near the capitol, and pleaſant gardens on the Appian way, as well as a villa in his native country. A lively genius and a fertile imagination gained him many admirers; Virgil, Propertius, Tibullus, and Horace, honoured him with their correſpondence, and Auguſtus patroniſed him with the moſt unbounded liberality. He had rendered himſelf famous by ſeveral poetical compoſitions, when, at about the age of fifty, he incurred a ſentence of baniſhment, which was never revoked, and which made him an exile for the remainder of his life. The true cauſe of this circumſtance has never been known. Few incidents in claſſical biography have more excited the diſcuſſion of the curious than this; ſtill a myſtery hangs upon it which no elucidation can thoroughly clear. He has himſelf aſſigned two reaſons for the anger of Auguſtus; one, and that the oſtenſible cauſe, though certainly not the true reaſon, the licentiouſneſs of his juvenile poems; the other, he ſays, was an error, not a crime, ſomething of which his eyes had been guilty, not his intentions:

> "Inſcia quod crimen viderunt lumina plector,
> Peccatumque oculos eſt habuiſſe meum."

And in another places he writes,

> "Perdiderunt cum me duo crimina, carmen et error
> Alterius facti culpa ſilenda mihi eſt."

It was ſomething in which the emperor's feelings were particularly concerned; ſome attribute it to an amour of Ovid with Livia, the wife of Auguſtus, while others ſuppoſe it aroſe from the knowledge which the poet, involuntarily, had of the ſhocking inceſt of the emperor with his daughter Julia. The place of Ovid's exile was Tomi, a town in Scythia, near the Euxine ſea, and not far from the mouths of the Danube. His elegiac epiſtles from that place are full of complaints of the ſeverity of the climate, the wildneſs of the ſcenery, and the ſavage manners of the ſurrounding people. How long he lived in this condition is not certainly known; he was alive in the eighth year of his exile, which was two years after the death of Auguſtus. That

event had no effect in producing his recall, for Tiberius was either hoſtile or indifferent to him. He felt moſt bitterly this perpetual excluſion from cultivated life, and all the conſolations of friendſhip and domeſtic affection, and does not affect a ſtrength of mind which did not belong to his character. The Euſebian chronicle places his death in the fourth year of Tiberius, but the authority cannot be relied upon. The people of Tomi are ſaid to have mourned publicly for him, and to have erected a ſtately monument to his memory without the walls of their city. Ovid was a copious writer, and the greater part of his works has come down to our times. Thoſe which we poſſeſs are his "Heroical Epiſtles," compoſed in the characters of diſtinguiſhed lovers in the heroical ages; his elegies entitled "Amorum," and books on the "Art of Love;" his fifteen books of "Metamorphoſes;" his ſix books of "Faſti" on the Roman calendar, which are only half the number that he compoſed; his elegiac lamentations entitled "Triſtia," and "Epiſtolæ ex Ponto." Beſides theſe there is his "Ibis," written in imitation of a poem of Callimachus of the ſame title, which is a ſatyrical performance: there are alſo fragments of other poems, among theſe ſome of a tragedy entitled "Medea." The loſs of half the "Faſti" is to be greatly regretted, as it is probable it contained much valuable and intereſting information reſpecting the religious antiquities of the Romans. The tragedy of "Medea" was regarded as one of the beſt productions of the Roman theatre. On whatever he has written, he has totally exhauſted the ſubject. He ever paints nature with a maſterly hand, and gives ſtrength to the moſt vulgar expreſſions. "There is no ſubject, which in his hands he does not turn into poetry, or, at leaſt, into elegant verſe. His vein is inexhauſtible; and his principal faults ariſe from that ſuperabundance of wit and fancy, which is apt to run him out of breath, while he chaſes one thought or image after another. He abounds beyond any other ancient with points and turns of expreſſion ſometimes really beautiful and ſtriking, often deviating into trifling puerility. In his happieſt moods, he deſcribes with wonderful force and vivacity; he is ſometimes ſplendid and pictureſque, ſometimes elegantly chaſte and ſimple. With all his tendency to ſuperfluity, no one has exceeded him in the neat and energetic brevity with which he occaſionally gives a moral ſentiment, ſo that his works are an admirable ſtore of mottos and ſentences. He is ſometimes, though rarely, ſublime, often brilliant, frequently pathetic, and almoſt always amuſing. If he does not rank with the very firſt claſs of poets, he is certainly one of the moſt agreeable." The editions of the whole, and of detached parts of his works, have been extremely numerous. The following have been mentioned as among the moſt valuable of the whole works; that of Heinſius, Elzevir, 3 vols. 12mo. 1629; Burman's, Amſt. 4 vols. 4to. 1727; and of Utrecht, 4 vols. 12mo. 1713; Wetſtein's Amſt. 3 vols. 12mo. 1751; Barbou's, Paris, 3 vols. 12mo. 1762; and Fiſcher's, Lipſ. 4 vols. 8vo. 1773.

Ovid, in *Geography*, a poſt-town of New York, in Cayuga county, incorporated in 1794, and containing 2169 inhabitants.

OVIEDA, in *Botany*, received that name from Linnæus, in honour of Gonſalvo Ferdinando d'Oviedo, alias de Valde, a Spaniſh divine, who in the reign of Ferdinand V. was ſuperintendant of the gold mines of South America, and reſided at Santa Maria in Darien, of which he was rector. He wrote a hiſtory of the Weſt Indies, containing an account of many American plants; which may be ſeen in the collection of Voyages, publiſhed by the Giunti, at Venice, in 1556, and which is taken from the Spaniſh edition, printed at Toledo in 1526. Of this there are Engliſh, Italian, and French tranſlations. Plumier, who firſt eſtabliſhed the preſent genus, called it *Valdia*, which Linnæus properly corrected.—Linn. Gen. 325. Schreb. 425. Willd. Sp. Pl. v. 3. 381. Mart. Mill. Dict. v. 3. Juſſ. 211. Lamarck Illuſtr. t. 538. Gærtn. t. 57. (Valdia; Plum. Gen. 11. t. 24.)—Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Perſonatæ*, Linn. *Caprifolia*, rather *Vitices*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, bell-ſhaped, erect, in five ſhort, broadiſh, acute, permanent ſegments. *Cor.* of one petal, ringent; tube extremely long, narrow, nearly cylindrical; limb ſhort, in five (not three), nearly equal, obtuſe ſegments. *Stam.* Filaments four, thread-ſhaped, longer than the corolla, incurved at the ſummit, two of them rather the longeſt; anthers roundiſh. *Piſt.* Germen ſuperior, globoſe; ſtyle thread-ſhaped, the length of the ſtamens; ſtigma in two acute ſegments. *Peric.* Berry nearly globoſe, four-lobed, of one cell, ſeparable into four parts, ſtanding upon the enlarged calyx. *Seeds* four, tumid on one ſide, angular on the other, of one cell.

Eſſ. Ch. Calyx five-cleft. Corolla with a very long cylindrical tube; limb five-cleft, nearly equal. Berry globoſe, with four ſeeds.

1. O. *ſpinoſa*. Spinous, or Weſt Indian, Ovieda. Linn. Sp. Pl. 888. Swartz Obſ. 248. (Valdia cardui folio, fructu ſubcæruleo; Plum. Ic. 254. t. 256.)—Leaves elliptical, with ſpinous teeth.—Native of Hiſpaniola. Our ſpecimen was gathered by Von Rohr in that iſland, near the town called *aux Cayes*, and communicated by ſir Joſeph Banks. Linnæus had never ſeen this plant, which is one of the rareſt productions of the Weſt Indies. The *ſtem* is ſhrubby, with rough branches. *Leaves* oppoſite, on ſhort, round, downy *footſtalks*, elliptical or obovate, acute, rigid, four or five inches long and two broad; ſmooth above; reticulated with numerous ſtrong veins beneath; bordered with broad, unequal, ſpinous teeth. *Panicle* terminal, erect, corymboſe, ſomewhat leafy, its ſtalks oppoſite, three-cleft, downy. *Bracteas* lanceolate, deciduous. *Calyx* hairy, with ten ſtrong ribs, and five ſpinous, ſpreading, not very deep, teeth. *Corolla* three inches long, downy, apparently white with a purple tinge, or perhaps entirely purple when freſh, the limb in five, nearly equal, obtuſe, ſpreading, downy-edged ſegments, each above half an inch long. Plumier ſays the ſegments are generally but three. His deſcription of the inſertion of the *corolla* upon an inner calyx, is unintelligible to us, and we preſume he means that the globular baſe of the *tube* cloſely envelopes the *germen*. He deſcribes the *fruit* as blueiſh; Swartz ſays it is black, ripening in May.

2. O. *mitis*. Smooth, or Eaſt Indian, Ovieda. Linn. Sp. Pl. 889. Burm. Ind. 136. t. 43. f. 1.—Leaves linear-lanceolate, wavy, entire.—Native of Java. A ſmooth and unarmed *ſhrub*. *Leaves* four in a whorl, nearly ſeſſile, five or ſix inches long, not an inch wide, acute, entire, thick-edged, ſlightly wavy, ſmooth, with many curved inter-branching veins. *Stipulas* awl-ſhaped, minute, within the footſtalks. *Panicle* large, leafy, terminal, of numerous, three-forked, axillary and terminal, ſmooth branches. *Bracteas* lanceolate or linear, ſmooth. *Calyx* ſomewhat glutinous, unarmed. *Corolla* as long as the former ſpecies, rather downy upwards; its limb in five obtuſe, concave, nearly equal ſegments, laterally overlapping each other in the bud. Their colour ſeems to be white or yellowiſh, with ſtains of red or purple. It is remarkable that Burmann repreſents the corolla of this with only three ſegments. Perhaps he ſaw but a bad dry ſpecimen, and truſted to Plumier and Linnæus for the generic character. The *leaves* are whorled in Linnæus's own ſpecimen, though he deſcribes them

them as oppoſite, and has led ſome botaniſts to think the whorled plant a new ſpecies. *O. mitis* is the only ſpecies he ever ſaw, even in a dried ſtate.

OVIEDO, Andres de, in *Biography*, biſhop of Hieropolis, and patriarch of Ethiopia, was born at Ilhecas, a town ſituated half way between Madrid and Toledo. He graduated at Alcala, and then went to Rome, where, in the year 1541, he entered the ſociety of Jeſuits, then only in its infancy. When Joam III. founded the firſt Jeſuit college at Coimbra, he, with eight Flemiſh companions, was ſent to colonize it by Peter Faber. Oviedo ſoon diſtinguiſhed himſelf by his devotion, his humility, and ſelf-auſterity, and was nominated rector of a college at Gandia. He was afterwards made rector of the college at Naples: in theſe ſituations he performed the duties required of him with exactneſs, and inflicted upon himſelf the moſt ſevere mortifications. "Thus far," ſays Mr. Southey, "his talents had been well employed; but when Loyola nominated him as coadjutor and ſucceſſor to Joam Nunez Bareto in the Abyſſinian miſſion, he miſtook the character of Oviedo. A ſtateſman was wanted, not a fanatic." He was conſecrated biſhop of Hieropolis, and with oſtentatious humility he uſed to fetch water for the college. In 1556 he and Bareto ſet ſail, and reached Goa in little more than four months. The affairs of Abyſſinia at this time were in ſo unproſperous a ſtate, that it was not thought expedient for the patriarch to proceed thither; he was therefore detained at Goa, while Oviedo, with his five companions, was ſent forward on the miſſion. They landed at Arkeeko five days only before that fort was taken poſſeſſion of by the Turks. On his way to court, Oviedo was welcomed by the Portugueſe, and received with every mark of reſpect and honour: but he was outrageous againſt the reigning prince, who would not change his creed, and threatened to excommunicate all who remained in his ſervice. He himſelf would have returned to India, but was perſuaded by his countrymen, who were ſettled in Abyſſinia, not to leave them. At length Oviedo and the other Jeſuits excited a rebellion in the country, and though they were ſucceſsful in their attempts to injure and haraſs the exiſting government, yet their ſtay in the country was thought ſo fruitleſs, that orders came from Rome for them to go to Japan. By the death of Bareto, Oviedo had now ſucceeded to the vain title of patriarch, but now he had no poſſible means of getting away from Abyſſinia, and ſo completely deſtitute was he of all European conveniences, that the letter which he contrived to ſend to Rome was written upon ſlips of paper cut from the margin of his breviary. He lingered out the remainder of his days in obſcurity, and died in 1577, having been twenty years employed in a miſſion, for which he was in no reſpect properly qualified. Gen. Biog.

Oviedo, Gonzalo Fernandez de, one of the earlieſt hiſtorians of the new world, was born at Madrid in 1478. He ſpent his youth about the court, and became page to Ferdinand king of Arragon, and Iſabella queen of Caſtile. He accompanied Columbus on his firſt voyage to Hiſpaniola, where he reſided many years, and wrote the "Hiſtoria General de las Indias," in fifty books. Twenty-one of theſe were printed at Seville in 1535, and at Salamanca in 1547. A ſummary of this work, which Oviedo drew up for the emperor Charles V., is inſerted in Barcia's collection of the "Hiſtoriadores Primitivos de las Indias Occidentales." This ſummary contains the moſt deciſive paſſage concerning the importation of "Syphillis" from America, that is any where to be found. He wrote two tracts concerning the "Palo de Guayacan," and the "Palo Santo," tranſlations of which are in the firſt volumes of his collection "Scriptorum de Morbo Gallico." The office of chronicler was given to him by Charles V. when he was in the ſeventieth year of his age. He left behind him many unpubliſhed works, beſides the ſequel of his great hiſtory. Moreri. Gen. Biog.

Oviedo, *Ovietum*, in *Geography*, an ancient town of Spain, the only city and the capital of the Aſturia of its name. It is ſituated on a plain, rather elevated, at the confluence of the two little rivers Ovia or Ove, and Nora, the former of which runs into the Nora, and this into the Nalon, the firſt running to the N., and the ſecond to the S. of Oviedo. Some, without ſufficient authority, have made Oviedo the "Lucus Aſturum;" others have deduced its name from the Ovia, after Froila, the grandſon of Pelagius, had built it in 757; and according to others again, it was ſo conſiderable in the time of Pelagius, that after his firſt acceſſion he made it the chief place of his ſtates, and transferred to it the epiſcopal ſee of a neighbouring town called "Emerita." However this be, Oviedo, in the ninth century, was honoured throughout Chriſtendom with the ſingular title of "the city of biſhops," becauſe a number of them, exiled and perſecuted by the Saracens, took refuge in this place. In 901 a council was held here, and while it was convened, the biſhopric was elevated into an archbiſhoric by the pope, which dignity was afterwards transferred to the church of St. Jago de Compoſtella: and Oviedo again became a biſhopric: the revenue of it is eſtimated at 1250*l.*

Oviedo contains an epiſcopal palace, a cathedral, a collegiate chapter, three pariſhes, three convents of monks, three of nuns, three colleges, three hoſptials, an univerſity founded in 1580, a drawing ſchool, a royal audience, an alcade mayor, a common adminiſtration, &c. Its population is eſtimated at about 6400 inhabitants. The ſtreets are tolerably ſtraight, regular, and well paved; the principal ſquare is handſome and large, and almoſt all the ſtreets open into it, and the market is held there. The public edifices are a Gothic cathedral, ſaid to be built by Froila I. in 760, and containing a rich treaſury of valuable vaſes, relics and ornaments, and the bones of 14 kings and queens; the beautiful church of San Salvador, built by a prince named Sito, who flouriſhed in 774, and enriched by a great number of relics; the univerſity, which is conſidered one of the handſomeſt ornaments of the town; and the aqueduct of forty arcades. Oviedo has little commerce: it has two tan-yards, a manufactory of hats, one of horn-combs and bone buttons, and a grand magazine of arms for the army; 47 miles N. of Leon. N. lat. 43° 19′. W. long. 5° 57′.

OVILIA, or Septa, in *Ancient Rome*, a place in the Campus Martius, at firſt railed in like a ſheep's pen; whence its name.

Afterwards it was mounted with marble, and beautified with walks and galleries; as alſo with a tribunal, or ſeat of juſtice.

Within this precinct, or incloſure, the people were called to give their ſuffrages for the election of magiſtrates.

The aſcent into the ovilia was not by ſtairs, but by pontes; a ſort of bridges made for the time; every curia, tribe, and century, as the aſſembly was centuriate or tribute, &c. having its proper bridge.

Whence the proverb, *de ponte dejiciendus*, where a perſon is to be debarred from giving his vote. See Comitia.

OUINEASKE, or Shelburne *Bay*, in *Geography*, a bay on the E. ſide of lake Champlain, which ſets up ſoutherly, through the town of Burlington, in Vermont, into the northern part of Shelburne.

OUINICHTAGAN, a lake of Lower Canada; 138 miles N. of Quebec. N. lat. 50°. W. long. 70° 56′.

OVIPAROUS, in *Natural Hiſtory*, a term applied to ſuch animals as produce their young *ab ovo*, *from eggs*; as birds, inſects, &c.

The oviparous kind ſtand in oppoſition to thoſe which bring forth their young alive, called viviparous animals, as man, quadrupeds, &c.

Oviparous animals may be defined to be ſuch as conceive eggs, which they afterwards bring forth, and from which, by the incubation of the parent, or ſome other principle of warmth and fermentation, at length ariſe animals; which after they have ſpent the moiſture or humour they were ſurrounded withal, and are grown to a ſufficient bulk, firmneſs, and ſtrength, break their ſhell, and come forth.

The oviparous kind, beſide birds, include divers ſpecies of animals; as ſerpents, lizards, tortoiſes, crabs, lobſters, frogs, &c. See EGG.

The diſtinction between oviparous and viviparous creatures, ſeems, in the inſect world, to be much leſs fixed and determinate than is ſuppoſed. It is evident, that ſome flies, which are naturally oviparous, if they are kept from the finding a proper nidus for their eggs, be it meat, or any thing elſe, will retain them ſo long beyond their due time of excluſion, that they will hatch into worms in the body of the parent, and be afterwards depoſited alive in fleſh, or in the manner of the young of the viviparous inſects. Bartholine gives an account, in his Medical Obſervations, of a hen, which, inſtead of eggs, brought forth no leſs than five living chickens; but ſhe died of it.

OVIS, the Sheep, in *Zoology*, a genus of the claſs and order Mammalia Pecora. The generic character is; horns hollow, wrinkled, turned backwards and outwards into a circular or ſpiral form. It has eight lower fore-teeth, and is without tuſks. The animals of this genus are gentle, harmleſs, and uſeful; they ſupply food and raiment, and prefer open plains; they are not very active, and fight by butting each other with the head reclined; they threaten by ſtamping the ground with their feet; they drink little; the females are gravid five months, bring one or two, rarely three, young at a time. According to the Linnæan ſyſtem there are four ſpecies, but Dr. Shaw includes the whole genus in three ſpecies, making the *ſtrepſiceros*, or Cretan ſheep, a mere variety of O. aries. We ſhall abide by the Linnæan arrangement.

Species.

ARIES; Common ſheep. Horns compreſſed and lunate. Of this ſpecies there are 13 varieties.

1. The hornleſs ſheep, of which the tail and ſcrotum hang as low as the knees; breeds of this kind of ſheep are raiſed in many counties of England, and ſome other parts of Europe.

2. Black-faced ſheep; this is horned; the tail is ſhort; the wool is ſhort and coarſe.

3. Spaniſh ſheep that has ſpiral horns, lengthened outwards; the wool is fine and plentiful. The principal diſtinction of the Spaniſh ſheep is the fineneſs of the fleece, and the horizontally extended ſpire of the horns.

4. Many-horned ſheep; this has more than two horns; it occurs in the northern parts of Europe more frequently than in other regions, and is ſaid to be the moſt common in Iceland. The horns are either three, or four, or five, in number; ſometimes placed with the greateſt regularity, and ſometimes differing in proportion and ſituation. A four-horned variety, with very long hairs hanging from the breaſt, is alſo found in ſome parts of Europe; the two largeſt horns are ſtraight, and nearly upright on the top of the forehead, while the ſmaller pair are ſeated on each ſide the head, and turn downwards.

5. African ſheep. Hair inſtead of wool, ſhort.

6. Guinea ſheep. Ears pendulous; dewlaps lax, hairy; hind part of the head prominent. This, which is ſometimes termed the Cape ſheep, and which is erroneouſly mentioned in Buffon's Natural Hiſtory as of Indian extraction, is ſuppoſed to be moſt frequent in Guinea, and is diſtinguiſhed from others by its remarkably meagre appearance, length of neck and limbs, pendant ears, and long arched or curved viſage. It is covered with hair rather than wool, and has a pair of pendent hairy wattles beneath the neck, as in goats. The horns are ſmall, and the tail long and lank.

7. Broad-tailed ſheep. This is diſtinguiſhed by a long and very broad tail. It is found in Syria, Barbary, and Ethiopia. Alſo in Tartary, Tibet, &c. Its general appearance, as to the other parts of the body, ſcarcely differs from that of European ſheep, and in Tibet it is remarkable for the exquiſite fineneſs of its wool. The tails of theſe ſheep are ſaid to grow ſo large as to weigh from fifteen to fifty pounds, and in order to enable the animal to graze with convenience, the ſhepherds are often obliged to put a board, furniſhed with ſmall wheels, under the tail. This part of the ſheep, as an article of food, is reckoned a great delicacy.

8. Fat-rumped ſheep. Ears large, pendulous; large fatty cuſhions on the hips, and without a tail; or if there be a tail it is ſo enveloped with fat as to be ſcarcely viſible, the parts on each ſide ſwelling out into a pair of naked hemiſpheres, of ſuch a ſize as ſometimes to weigh nearly forty pounds. The ſheep of this variety are found in many of the Tartarian deſerts from the Wolga to the Irtis and the Altaic chain of mountains.

9. Bucharian ſheep. Ears large, pendulous; cuſhions on the hips leſs; the tail is long and flat.

10. Long-tailed ſheep. The tail is very long and woolly.

11. Cape ſheep. Ears large, pendulous; tail large and broad.

12. Bearded ſheep. Beard long, divided, hanging from the lower parts of the cheeks and upper jaw.

13. Morvant. Beard long, on the fore-part of the breaſt; neck with a ſhort mane.

Such are the ſeveral varieties as deſcribed by Gmelin and others; who obſerve that this animal, in its ſtate of complete domeſtication, appears as ſtupid as it is harmleſs; it is characteriſed by Buffon as one of the moſt timid, imbecile, and contemptible of quadrupeds. When ſheep, however, have an extenſive range of paſture, and are left, in a conſiderable degree, to depend on themſelves for food and protection, they exhibit a more decided character. A ram has been ſeen in theſe circumſtances to attack and beat off a large and formidable dog, and even a bull has been felled by a ſtroke received between his eyes as he was lowering his head to receive his adverſary on the horns and toſs him in the air. Sheep diſplay conſiderable ſagacity in the ſelection of their food, and, in the approach of ſtorms, they perceive the indications with accurate preciſion, and retire for ſhelter always to the ſpot which is beſt able to afford it. The ſheep is more ſubject to diſorders than any of the domeſticated animals; giddineſs, conſumption, ſcab, dropſy, and worms frequently ſeizing upon and deſtroying it. Of all diſorders the moſt fatal is owing to vaſt numbers of worms of the genus *faſciola* (which ſee), which are found in the liver and gall-bladder. They are of a flat form, of an oval ſhape, with ſlightly pointed extremities, and bear a general reſemblance to the ſeeds of a gourd. The fly is another formidable enemy, and is often fatal in the courſe of twenty-four

hours, breeding within the ſkull of the animal. To extricate the ſheep from this danger, the French ſhepherds apply the *trephine* without the ſmalleſt heſitation, and with the greateſt diſpatch and ſucceſs.

AMMON; Siberian ſheep. Horns arched, ſemi-circular, above wrinkled, flattiſh beneath, dewlaps lax, hairy. A variety of this ſpecies has its body brown tinged with tawny; a white mark on each ſide pointing to the belly. It inhabits in flocks the rocky dry deſerts of Aſia, Barbary, and Corſica; it is the ſize of a ſmall deer; active, ſwift, wild; the fat and fleſh are delicious. In ſummer the colour is browniſh-aſh mixed with grey: beneath whitiſh-grey; the tail is ſhort, white and browniſh at the tip; the hair is long in the winter, and is ſhed in the ſpring; the ears are erect, acute; the hind-feet are longer than the fore. The favourite regions of theſe wild ſheep are Siberia, Kamtſchatka, and the Kurile iſlands. They are ſocial animals, and feed together in ſmall flocks. They are the moſt uſeful animals that the Kamtſchadales poſſeſs.

PUDU. Horns round, ſmooth, divergent. It inhabits the Cordilleras in South America, is gentle, deſcends in the winter into the vallies; ſize of a half-grown kid, and reſembles a goat, but the horns are turned round outwards; it has no beard, the female is without horns, the colour is duſky. The animals of this ſpecies feed together in flocks; in the mildeſt months they frequent the ſummits of the mountains, but retire from the ſeverity of winter into the vallies, where they are eaſily taken, and when taken, of whatever age, it is not difficult to domeſticate them.

STREPSICEROS; Cretan ſheep. Horns erect, carinate, ſpirally twiſted. It is found principally in the iſland of Crete, and is kept in ſeveral parts of Europe for the ſingularity of its appearance; the horns being very large, long, and twiſted like a ſcrew; thoſe of the male are upright; thoſe of the female at right angles to the head.

OUISCONSING, in *Geography*. See OOISCONSIN. This river has a communication with Fox river, which paſſing through Winnebago lake, enters Puan bay in lake Michigan. On this river and its branches reſide the Indians of its name, furniſhing 300 warriors.

OUISTISI, in *Zoology*. See SIMIA *Iacchus*.

OUIATANOU, or OUIATANON, in *Geography*, a town and fort of North America, in the Indiana territory, on the W. ſide of the Wabaſh. N. lat. 40° 38'. W. long. 87° 58'. Thus far the Wabaſh is navigable, 412 miles from its mouth, for bateaux drawing three feet water. A ſilver mine has been diſcovered here. The neighbouring Indians are the Kickapoos, Muſquitons, Pyankiſhaws, and a prineipal part of the Ouiatanons. All theſe tribes, collectively, could, about 30 years ago, furniſh 1000 warriors.

OUJULDINGA, a town of Bengal; 25 miles N.E. of Kiſhenagur.

OUJULINKA, a town of Thibet, near lake Jamdro; 42 miles E.S.E. of Kiang-ſee.

OUKAKEE, a lake of Canada; N. lat. 50° 20'. W. long. 86° 30'.

OUKERCK, a town of Holland; 7 miles. S. of Naarden.

OUKE-SIMA, an iſland in the Chineſe ſea, near the coaſt of Tonquin; about 30 miles in circumference. N. lat. 18° 44'. E. long. 105 42'.

OUKE-TANACSA, a town of Thibet; 90 miles E. of Laſſa.

OULAIS, a town of Sweden, in the government of Ulea; 25 miles S.S.E. of Braheſtadt.

OULAN-HOTUN, a town of Chineſe Tartary, in the territory of the Monguls; 120 miles N. of Peking.

OULAN-TABALAN, a town of Thibet; 58 miles S. of Cha-tcheou.

OULART, a ſmall poſt-town of Ireland, in the county of Wexford; 57 miles S. from Dublin and 10 N. from Wexford.

OULBARAYA, a town of Bengal; 48 miles E.S.E. of Burdwan.

OULCHY *le Chateau*, a town of France, in the department of the Aiſne, and chief place of a canton, in the diſtrict of Soiſſons; 10 miles S. of Soiſſons. The place contains 307, and the canton 7790 inhabitants, on a territory of 260 kiliometres, in 31 communes.

OULLER, or TAL, the name of a lake in Hindooſtan, which lies near Sirinagur, and receives the river Behut. This lake is ſaid to be of great extent, no leſs than 53 Britiſh miles in circuit, or perhaps 16 or 17 acroſs; according to which ſtatement it may reach to the frontiers of Little Thibet. The courſe of the Behut is to the N.W. from Sirinagur to the lake; but the length of its courſe in this direction is not aſcertained, any more than the length and direction of its courſe from the lake to its entry between the mountains at Barchmooleh. It may, however, be inferred, that the courſe of the Behut, after its efflux from the lake, is ſhort, and towards the S W. quarter; by which, Barchmooleh will take a W. by N., or W.N.W. poſition, in reſpect of Sirinagur.

OULNEY. See OLNEY.

OULSTEEN, an iſland near the coaſt of Norway, triangular in its form, and 24 miles in circumference; 120 miles N. of Bergen.

OULUA, a town of Hindooſtan, in Bahar; 20 miles S.S.E. of Bettiah.

OULUSTON, a lake of Chineſe Tartary, in the country of the Monguls. N. lat. 43° 25'. E. long. 114° 42'.

OULX, a town of France, in the department of the Po, late in Piedmont, ſituated in a valley, which derives from it its name; taken by the French in May 1794; 5 miles N. of Sezanne.

OUMA, a river of Africa, in Congo, which runs into the Bokian; 15 miles S. of Pango.

OUMARY, a town of Hindooſtan, in Goondwana; 16 miles S. of Nagpour.

OUMIEN, a name given by the Chineſe to a peculiar ſort of porcelain, of which they are very fond. It is black, ornamented with gold. They ſometimes alſo call the blue and gold, which is made in the ſame manner, by the ſame name. They colour it with three parts of the azure, and ſeven parts of oil of ſtone, and lay on the gold afterwards. If they would have it blueiſh, they add leſs of the azure, and ſome ceruſs white.

OU-MONG, in *Geography*, a town of the firſt rank in China, in Se-tchuen. N. lat. 27° 20'. E. long. 103° 29'.

OUNCE, UNCIA, a little weight, the ſixteenth part of a pound avoirdupois; and the twelfth of a pound troy.

The word is derived from the Latin, *uncia*, the twelfth part of any whole, called *as*; particularly in geometrical meaſures, an inch, or the twelfth part of a foot.

The ounce *avoirdupois* is divided into ſixteen drachms.

The ounce *troy* into twenty penny-weights, and the penny-weight into twenty-four grains. See WEIGHT.

The ounce, *once*, makes the eighth part of a French mark, and is divided into three groſs or drachms: the drachm into three penny-weights or ſcruples; and the ſcruple into twenty-four grains; each grain being computed to weigh a grain of wheat.

All precious merchandizes, as gold, ſilver, ſilk, &c. are ſold by the ounce.

Ounce *Pearls*, are thoſe too ſmall to be ſold by tale; uſually called *ſeeds-of pearl*, or *ſeed-pearls*.

Ounce *Cottons*, brought from Damaſcus, are of a kind and quality ſuperior to any other cotton.

Ounce, in *Zoology*. See Felis.

OUNDLE, in *Geography*, a market-town and pariſh, in the hundred of Polebrook, and county of Northampton, England, is ſituated on the north bank of the river Nen, which, making a horſe-ſhoe bend in its courſe here, almoſt environs the town. Camden, and the author of "Magna Britannia," aſſert that its proper name is Avondale, as ſtanding in the vale of Avon, the original appellation of the Nen. But this opinion ſeems extremely doubtful, as we find this place mentioned in the Domeſday-book, under the deſignation of Undele. The market-day in Oundle is Saturday, and there are four fairs annually. Here is an excellent free grammar-ſchool, founded by ſir William Laxton, a native of the town, and who was lord-mayor of London in 1544. The ſame beneficent perſon likewiſe erected and endowed the alms'-houſe, and placed both it and the ſchool under the patronage of the Grocers' company of London, of which he was a member. The charity-ſchool, eſtabliſhed in 1620, owed its origin to the munificence of Nicholas Latham, who was for more than fifty years rector of Barnwell St. Andrew's. This perſon alſo founded a guild, or hoſpital here for the reception of ſixteen aged women, who have a weekly allowance for their ſupport.

The church belonging to this town is a ſpacious edifice, conſiſting of a nave, north and ſouth aiſles, tranſept and chancel, with a ſquare tower, ſurmounted by an hexagonal, crocketted ſpire. The tower diſplays a ſeries of five ſtories, and is terminated at each angle by a ſmall octagonal turret. Over the river here are two large bridges, one on the road towards Thrapſton, and the other on that leading to Yaxley, in Huntingdonſhire. The former, called North-bridge, is generally much admired, not only on account of the number and forms of its arches, but alſo for its cauſeway, which is formed on an arcade, and ſecures a paſſage to and from the place during the time of floods. Peter Hauſted, author of the "Rival Friends," "Senile Odium," &c.; and Dr. John Newton, a celebrated divine and mathematician, were natives of this town.

About three miles to the ſouth-eaſt of Oundle, the Roman road called the Via-Devana croſſes the country in an oblique direction from ſouth-eaſt to north-weſt. Adjoining to this road is the pariſh and village of Aldwinckle-All-Saints, diſtinguiſhed as the birth-place of the poet Dryden, one of the moſt original and energetic writers of his age. Aldwinckle-St. Peter's, to the weſt of this pariſh, is likewiſe noted as the birth-place of Dr. Thomas Fuller, author of a "Church Hiſtory," "A Hiſtory of the Worthies of England," and various other works. (See Fuller.) At Barnwell St. Andrew ſtand the ruins of a caſtle, erected by Reginald le Moine, and deſcribed by Leland under the title of "Berengarius Moynes Caſtel." It was long the baronial reſidence of the Montecute and Montague families, but has been for many years uninhabitable. It ſtill forms, however, a very noble and curious ſpecimen of ancient architecture, much of the original ſtructure having ſurvived the attacks of time and of alteration. The preſent remains conſiſt of four round maſſy baſtion towers, one ſtanding at each angle of a quadrangular court, which is incloſed by a wall three feet in thickneſs. Three of theſe connecting curtains are nearly entire, but that on the weſtern ſide is conſiderably dilapidated. The grand gateway, at the ſouth-eaſt front, ſtill remains, and is flanked by ſimilar circular baſtion towers of ſmaller dimenſions.

Cliff-Regis, or King's-Cliff, ſituated north-weſt from Oundle, is traditionally ſaid to have derived its name from the circumſtance of king John having had a hunting-ſeat here. It was formerly a market-town, but this privilege has been long diſcontinued. The Rev. William Law, a celebrated polemical and non-juring divine, was born at this place in 1686. He is chiefly diſtinguiſhed for his zealous vindication of the doctrine of the euchariſt againſt the ſentiments maintained by biſhop Hoadly, in the Bangorian controverſy.

The village of Fotheringay, which lies to the eaſt of King's-Cliff, and rather nearer to Oundle, is a place conſpicuous on the page of Engliſh hiſtory. Here was anciently a caſtle, probably firſt erected by Simon St. Liz, or Senliz, ſecond earl of Northampton, in the time of the Conqueror. It was afterwards entirely rebuilt, however, in the reign of Edward III., by Edmund Langley, duke of York, and paſſed by marriage from that family into the poſſeſſion of the Scottiſh kings, and in the 14th year of the reign of king John, David of Scotland was ſummoned to ſurrender it to the crown of England. William de Fortibus, earl of Albemarle and Holderneſſe, took it by ſurpriſe when it was held by Ranulph, earl of Cheſter, and having placed a garriſon in it, ravaged the adjacent country. It was ſoon again, however, yielded to the crown, and conſtituted for ſome time the reſidence of king Edward IV., and here Alexander, king of Scotland, had an audience of that monarch, and promiſed to do fealty and homage to him for his poſſeſſions in England. Henry VIII. ſettled this honour in dower on queen Catharine of Arragon, whom he ſo flagitiouſly divorced. But what renders it more particularly a ſubject of hiſtorical intereſt, is its connection with the fate of the unfortunate Mary, queen of Scots, who was tried, condemned, and executed here, to the indelible blemiſh of the otherwiſe illuſtrious reign of her rival Elizabeth. Nothing now remains of this once noble pile but the ſcite, the whole having been razed to the ground by the order of king James, immediately after his acceſſion to the Engliſh throne.

Fotheringay village was formerly much more extenſive and important than at preſent. It was indeed a conſiderable town, and had a weekly market, and three annual fairs. The grammar-ſchool, which is ſtill ſupported, was erected and endowed by queen Elizabeth. The church anciently belonged to a college for ſecular canons, founded by Edward, duke of York, in the year 1412, whoſe revenues at the diſſolution amounted to 489*l.* 15*s.* 9*d.* It contains ſeveral monuments in honour of the dukes of York. Brydges's Hiſtory and Antiquities of Northamptonſhire, 2 vols. folio. Beauties of England and Wales, vol. xi., by John Britton, F.S.A.

OUNIAH, a town of Aſiatic Turkey, in the government of Sivas, on the Black ſea; 80 miles N. of Sivas.

OVO, a ſmall iſland in the Mediterranean. N. lat. 35° 39′. E. long. 25° 27′.

OVOCA, a river of Ireland, in the county of Wicklow, which runs into St. George's channel, a little below the town of Arklow, which is ſituated on it. It paſſes through a very intereſting country, both as to natural beauties and mineralogical productions. In one of its tributary ſtreams were found the pieces of gold which have excited ſo much attention.

OVOLO, Ovum, in *Architecture*, a round moulding, whoſe profile or ſweep in the Ionic and Compoſite capitals, is uſually a quadrant of a circle; whence it is alſo popularly called the *quarter-round*.

It is uſually enriched with ſculptures among the ancients,

in form of chefnut fhells; whence Vitruvius, and others of the ancients, call it *echinus*, chefnut-fhell.

Among us, it is ufually cut with the repreſentation of eggs and anchors, or arrows' heads, placed alternately; whence its Italian name *ovolo*; Latin, *ovum*; and French, *œuf*; q. d. *egg*.

OUPLE, in *Geography*, a town of Hindooſtan, in Dowlatabad; 10 miles E. of Perinda.

OUR, in *Ichthyology*, a variety of the MUGIL *ebulé*.

OUR *Lady*. See NOTRE DAME.

OUR *Lady of the Thiſtle*. See THISTLE.

OURA, in *Geography*, a town of Portugal, in the province of Tras los Montes; 9 miles S. of Chaves.

OURAN, or URAN SOANGUS, the name of an imaginary ſect of magicians in the iſland Gromboccanore, in the Eaſt Indies.

The word implies *men-devils*: theſe people were ridiculouſly ſuppoſed to have had the art of rendering themſelves inviſible, and paſſing where they pleaſed, and, by theſe means, doing infinite miſchief; for which reaſon the people hate and fear them exceedingly, and always kill them on the ſpot, when they can take them.

OURDA, in *Geography*, a town of Bengal; 72 miles N. of Dacca.

OUREM, a town of Portugal, in Eſtramadura, ſeated on a mountain, containing 1800 inhabitants; 12 miles W. of Thomar.

OUREOS, a ſmall iſland in the gulf of Engia; 14 miles N.W. of Engià.

OURFA, ROIHA, or *Rouah*, a town of Aſiatic Turkey, in the province of Diarbekir, anciently called "Edeſſa," which ſee; watered by a canal from the Euphrates. Many perſons, particularly among the learned Jews, have ſuppoſed it to have been the Ur of the Chaldees. The Grecks gave it the name of Edeſſa; and in honour of Antiochus, it was called Antiochia, which was diſtinguiſhed from others of the ſame name by the famous fountain Callirrhoe, and denominated Antiochia ad Callirrhoem.

Ourfa is built upon two hills, and in the valley between them, at the S.W. corner of a fine plain, rendered more beautiful by the rocky, mountainous parts that ſurround it: it is about three miles in circuit, encompaſſed by ancient walls, and defended by ſquare towers. On the north ſide is a deep foſſe, and the caſtle ſtands on a hill to the ſouth. Although the town is not well laid out, parts of it are well built. Its chief beauty conſiſts in ſome fine ſprings, that riſe between the two hills, and even in the walls of the city. The aſcent to the caſtle is very ſteep, and on three ſides of it is a deep foſſe: it is about half a mile in circumference, and has two Corinthian pillars, the capitals of which are admired; the columns conſiſt of 26 ſtones, each about one foot ſix inches thick. They are probably the remains of a portico belonging to ſome large temple. According to tradition, the throne of Nimrod ſtood on theſe pillars; but it is certain that Timur Bec erected ſome trophies on them. Ourfa is the reſidence of a pacha, who commands not only the greateſt part, if not the whole, of Macedonia, but a conſiderable tract of country to the weſt of it as far as Antab. This place carries on a great trade, as it is the great thoroughfare into Perſia. They prepare Turkey leather here, eſpecially that of the yellow kind, for which they were formerly famous. The Armenian Chriſtians, of whom there is a conſiderable number, have two churches, one in the city and another near it, in the latter of which they ſhew the tomb of a great ſaint, whom they call Ibrahim, and who was probably Ephraim Syrus, formerly deacon of Edeſſa. The ſurrounding country is fertile in corn and fruit. This town was firſt taken by the Saracens in 1087, retaken by the Chriſtians in 1097, and ſeized in 1142 by the Turks, who have ever ſince retained poſſeſſion of it; 80 miles S.W. of Diarbekir. N. lat. 36° 50'. E. long. 38° 25'.

OURGOOR, a town of Hindooſtan, in Golconda; 30 miles N.N.W. of Rachore.

OURICO, in *Zoology*. See HYSTRIX *Prehenſilis*.

OURIGUI, in *Geography*, a town of Hindooſtan, in Dowlatabad; 15 miles S.S.E. of Kondur.

OURIQUE, a town of Portugal, in Alentejo, containing about 2000 inhabitants; 24 miles S.W. of Beja. N. lat. 37° 39'. W. long. 8° 9'.

OURISIA, in *Botany*, a name of which we find no explanation. It was contrived by Commerſon; poſſibly from ὄρος, ὄρεος, *a mountain*, in alluſion to the natural ſtation of the plant. Juſſ. 100. Brown. Prodr. Nov. Holl. v. 1. 438. Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Perſonatæ*, Linn. *Pediculares*, Juſſ. *Scrophularinæ*, Brown.

Gen. Ch. *Cal.* Perianth inferior, in five deep, ſomewhat unequal ſegments, permanent. *Cor.* of one petal; tube funnel-ſhaped, aſcending, longer than the calyx; limb in five, obtuſe, nearly equal lobes. *Stam.* Filaments four, inſerted into the bottom of the tube, curved cloſely along its upper ſide, two of them rather the longeſt; anthers incumbent, within the tube; ſome deſcribe the rudiment of a fifth ſtamen. *Piſt.* Germen ſuperior, two lobed; ſtyle the length and poſition of the ſtamens; ſtigma of two obtuſe lobes. *Peric.* Capſule two-lobed, of two cells, and two valves, the partitions from the centre of the valves. *Seeds* numerous, with a lax tunic-like ſkin.

Eſſ. Ch. Calyx deeply five-cleft, rather unequal. Corolla funnel-ſhaped; limb five-cleft, nearly equal, obtuſe. Stigma two-lobed. Capſule of two cells, and two valves; the partitions from the centre of each valve. Seeds with a lax tunic-like ſkin.

1. O. *ruelloides*. (Chelone ruelloides; Linn. Suppl. 279. Willd. Sp. Pl. v. 3. 226.)—Leaves roundiſh-ovate, unequally crenate. Flower-ſtalks axillary, oppoſite.—Native of Terra del Fuego, in the clefts of rocks. *Root* perennial, creeping, with woolly fibres. *Stems* procumbent, ſhort, ſmooth. *Leaves* on long erect ſtalks, roundiſh-ovate, about two inches long, nearly ſmooth, with one central rib, and two pair of lateral ones, their margin unequally and rather bluntly crenate; the under ſide paleſt. Flowering *branches* decumbent, hardly a ſpan long, ſmooth, bearing two or three pair of rounded notched leafy *bracteas*. *Flowers* purple, on long, ſmooth, axillary, ſolitary, oppoſite, naked, ſimple *ſtalks*, from the two uppermoſt pair of *bracteas*. *Calyx* fringed. See CHELONE, ſp. 3. erroneouſly printed *melloides*.

2. O. *integrifolia*. Brown. n. 1.—Leaves nearly ovate, entire. Flower-ſtalk terminal, moſtly ſolitary. Gathered by Mr. Brown in Van Diemen's land. A ſmooth creeping plant, with a *calyx* more equally and deeply divided than the firſt ſpecies, as well as a ſhorter *corolla*, and a different aſpect, ſo that its diſcoverer was partly inclined to think it generically diſtinct. We have ſeen no ſpecimen of this laſt.

OURISSIA, in *Ornithology*, a ſpecies of the *Trochilus*; which ſee.

OURO, in *Geography*, a river of Africa, which runs into the Atlantic, N. lat. 23° 30'.—Alſo, a river of Africa, which runs into the Indian ſea, S. lat. 24° 25'.

OUROE, a ſmall iſland of Denmark, near the coaſt of Zealand, in the Iſefiord gulf; 4 miles N.E. of Holbeck. N. lat. 55 46' E. long. 11° 50'.

OUROLOGY, in *Medicine*, is the doctrine of diſeaſes, as judged of by the appearances of the *urine*.

The changes in the ſenſible qualities of the urine, under different

different circumſtances of diſeaſe, are conſiderable, and the ancients deduced many pathological inferences from theſe changes, and wrote ample treatiſes in explanation of their doctrines. Much of their ſuppoſed knowledge on the ſubject was, however, purely hypothetical, and altogether unworthy of ſerious attention. Although, doubtleſs, ſome indications are to be obtained from the appearances of the urine, both in acute and chronic complaints, yet theſe are much more limited than was formerly believed; and thoſe who pretend to aſcertain the nature of diſeaſes, by inſpecting the urine of the patient alone, are, therefore, impoſtors of the loweſt claſs; and it is truly diſcreditable to the general information of the age, that the Meyerſbachs and Van Butchels ſtill live upon the credulity of a Britiſh people.

The medical indications, as well as the chemical properties, of this excretion, will be treated of under the proper head. In the mean time, we may obſerve, that Dr. Blackall, a phyſician of Exeter, has recently given an importance to *uroſcopy*, which it never before poſſeſſed, by ſhewing that, in many caſes of dropſy, and other chronic diſeaſes, the urine contains much of the coagulable part of the blood, and thence deducing ſome important practical indications. See URINE.

OUROVANG, in *Ornithology*. See TURDUS *Urovang*.

OURRED, in *Geography*, a high hill of the county of Galway, Ireland, in the weſtern diſtrict, at the bottom of which is a lake of the ſame name.

OURRY'S ISLAND, or *New Alderney*, an iſland in the South Pacific ocean, diſcovered by Capt. Carteret, in Auguſt 1767, being one of the cluſter called Queen Charlotte's iſlands, about ten miles long and three broad. S. lat. 11° 10'. E. long. 165° 19'.

OURS, in *Zoology*. See URSUS.

OURSE, in *Geography*, a river of France, which runs into the Seine, at Bar ſur Seine.

OURTE, or OURTHE, one of the 13 departments of the region of France, called the Reunited country, formed of part of Liege and of Limbourg, and deriving its name from the river Ourte, or Ourthe, which riſes from two ſprings, one near St. Hubert, the other near the town of Ourte, both which unite near La Roche, and run into the Meuſe at Liege. This department is 42 French leagues long, and 12 broad, contains 4002½ kiliometres, or 213 ſquare leagues, and 313,876 inhabitants, and is ſituated N.E. of Sambre and Meuſe, in N. lat. 50° 35'. It is divided into three circles or diſtricts, 30 cantons, and 383 communes. The circles are Liege, including 151,975, Malmedy, 100,565, and Huy, 61,336 inhabitants. According to Haſſenfratz, it comprehends 5 circles, 36 cantons, and 310,444 inhabitants. Its contributions amounted, in the 11th year of the French era, to 2,424,974 francs, and its expences to 295,573 fr. 39 cents. Its capital is Liege. The firſt of the circles abounds in mines of iron, coal, and alum; in the ſecond are Spa waters; and in the third are mines of iron, alum, ſulphur, coal, &c.

OURTHE, or OURT, a town of France, in the department of the Foreſts; 4 miles N. of Luxemburg.

OURTON-POULAC, a town of Thibet; 15 miles S.W. of Yolotou-Hotun.

OURTS, in *Agriculture*, a provincial term applied to the leavings of fodder made by cattle. Sometimes written *orts*.

OURUCZE, in *Geography*, a town of Poland, in Volhynia; 68 miles N.N.E. of Zytomiers.

OURVILLE, a town of France, in the department of the Lower Seine, and chief place of a canton, in the diſtrict of Yvetot; 9 miles W. of Fécamp. The place contains 1257, and the canton 9553 inhabitants, on a territory of 117½ kiliometres, in 19 communes.

OUSBY, a town of Sweden, in the province of Schonen; 23 miles N. of Chriſtianſtadt.

OUSCOTTA, a town and fortreſs of Hindooſtan, in Myſore, taken by earl Cornwallis in April 1791; 15 miles N.E. of Bangalore.—Alſo, a town of Hindooſtan, in the circar of Sanore; 25 miles N. of Sanore.

OUSE, or *Grand River*, a river of Canada, which riſes in the country belonging to the Chippewa and Miſſaſſaga Indians, and running ſoutherly through the weſt riding of the county of York, croſſes Dundas ſtreet, and paſſing between the counties of Lincoln and Norfolk, diſcharges itſelf into lake Erie, about half-way between the Foreland and fort Erie. N. lat. 42° 50'. W. long. 79° 30'. About 40 miles up this river is the Mohawk village. The Senecas, Onondagoes, Cayugas, Augagas, Delawares, and Miſſaſſagas, have alſo villages on different parts of this river.

OUSE, a large river of England, which riſes in two branches not far from Brackley and Towceſter, on the borders of Northamptonſhire and Oxfordſhire, whence it flows eaſtward, through Buckinghamſhire, by Newport-Pagnell and Olney, into Bedfordſhire. After flowing ſeveral miles in the ſame direction, it makes a rapid ſweep to the ſouth, deſcending as far as Bedford, at which place it again bends to the north-eaſt, paſſing through the centre of the fens of Cambridgeſhire, where it is joined by the Cam, the Leſſer Ouſe, and the Larke, all of which are conſiderable ſtreams. It afterwards enters Norfolk, and traverſes the weſtern diviſion of that county, till it falls into The Waſh, a gulf of the ſea formed by the projecting coaſts of Norfolk and Lincolnſhire. A general Account of all the Rivers of Note in Great Britain, &c.; by Henry Skrine, eſq. L.L.B. 8vo. Lond. 1801. Beauties of England and Wales, vol. xi. Northamptonſhire.

OUSE, a large river in Yorkſhire, England, is formed by the junction of the Ure and the Swale, two very conſiderable ſtreams, which take their riſe in the northern moors of the county. The courſe of this river is nearly ſouth-eaſt, by Nun-Monkton, where its waters are increaſed by thoſe of the Nid, to the city of York; after paſſing which, it flows almoſt directly ſouth to Cawood. Near this place it is joined by the Wharfe, which has its ſource at the foot of the Craven-Hills, and changing its direction again to the ſouth-eaſt, runs paſt the town of Selby. About five miles below that town it receives the Derwent, and two miles ſtill lower down, the Aire, the ſecond moſt conſiderable river of Yorkſhire. Thus augmented, the Ouſe becomes as wide as the Thames at London, and after making a circuit to the ſouth near Swineſleet, takes a north-eaſterly direction to its confluence with the Trent from Lincolnſhire. Theſe rivers united conſtitute the Humber, which is the moſt important eſtuary in the north of England. See HUMBER. A general Account of all the Rivers of Note in Great Britain, &c. by Henry Skrine, eſq. L.L.B. 8vo. 1801.

OUSEEL, PHILIP, in *Biography*, a learned German, who flouriſhed in the eighteenth century, was born at Dantzic in the year 1671. He became miniſter of the German church at Leyden, and was afterwards profeſſor of divinity at Frankfort on the Oder. He died in 1724, at the age of fifty-three. His moſt important works are, "Introductio in accentuationem Hebræorum Metricam;" "Introductio in accentuationem Hebræorum Proſaicam;" "De Lepra;" and ſome treatiſes on the ten commandments.

OUSERAU, in *Geography*, a town of Hindooſtan, in Bahar; 25 miles W.N.W. of Rotaſgur.

OUSOURI,

OUSOURI, a town of Chineſe Tartary; 67 miles S.S.W. of London.

OUSSOOR, a town of Hindooſtan, in Myſore; 69 miles E.N.E. of Seringapatam. N. lat. 12 41'. E. long. 77° 52'.

OUST, a town of France, in the department of the Arriege, and chief place of a canton, in the diſtrict of St. Girons; 7½ miles S. of St. Girons. The place contains 1199, and the canton 12,407 inhabitants, on a territory of 525 kiliometres, in 10 communes.

OUSTAD, a town of Norway, in the province of Chriſtianſand.

OUSTED, formed from the French *oſter*, *to remove*, or *take away*, in our *Ancient Law Books*, a being removed, or put out of poſſeſſion.

OUSTER, or DISPOSSESSION, in *Law*, is an injury that carries with it the amotion of poſſeſſion; for thereby the wrong-doer gets into the actual occupation of the land or hereditament, and obliges him that hath a right to ſeek his legal remedy, in order to gain poſſeſſion, and damages for the injury ſuſtained. This ouſter may either be of the freehold by *abatement*, *intruſion*, *diſſeiſin*, *diſcontinuance*, and *deforcement*; or of chattels real, as an eſtate by ſtatute-merchant, ſtatute-ſtaple, or elegit, or an eſtate for years.

An abatement is where a perſon dies ſeiſed of an inheritance, and before the heir or deviſee enters, a ſtranger who has no right makes entry, and gets poſſeſſion of the freehold: this entry of him is called an abatement, and he himſelf is denominated an abator. For the other ſpecies of ouſter, ſee the ſeveral terms that expreſs them.

Ouſter, or amotion of poſſeſſion from eſtates held by ſtatute, recognizance, or elegit, is only liable to happen by a ſpecies of diſſeiſin, or turning out of the legal proprietor, before his eſtate is determined, by raiſing the ſum for which it is given him in pledge. And for ſuch ouſter, though the eſtate be merely a chattel intereſt, the owner ſhall have the ſame remedy as for an injury to a freehold, *viz.* by aſſiſe of novel diſſeiſin. But this depends upon the ſeveral ſtatutes, which recite theſe reſpective intereſts, and which expreſsly provide and allow this remedy, in caſe of diſpoſſeſſion. (The ſtatutes are ſtat. Weſtm. 2. 13 Edw. I. c. 18. Stat. *de mercatoribus*, 27 Edw. III. c. 9. Stat. 23 Hen. VIII. c. 6. § 9.) Upon which account it is that ſir Edward Coke obſerves (1 Inſt. 43.), that theſe tenants are ſaid to hold their eſtates *ad liberum tenementum*, until their debts be paid; becauſe by the ſtatutes they ſhall have an aſſiſe, as tenants of the freehold ſhall have; and in that reſpect they have the ſimilitude of a freehold.

As for ouſter, or amotion of poſſeſſion, for an eſtate for years; this happens only by a like kind of diſſeiſin, ejection, or turning out, of the tenant from the occupation of the land during the continuance of his term. For this injury the law has provided him with two remedies, according to the circumſtances and ſituation of the wrong-doer; the writ of *ejectione firmæ*, which lies againſt any one, the leſſor, reverſioner, remainder-man, or any ſtranger, who is himſelf the wrong-doer, and has committed the injury complained of; and the writ of *quare ejecit infra terminum*, which lies not againſt the wrong-doer or ejector himſelf, but his feoffee, or other perſon claiming under him. Theſe are mixed actions, ſomewhat between real and perſonal; for therein are two things recovered, as well reſtitution of the term of years, as damages for the ouſter or wrong. See EJECTIONE *Firmæ*, and QUARE *ejecit*, &c.

OUSTER *le Main*, *amovere manum*, denotes a livery of lands out of the king's hands; or a judgment given for him that traverſed, or ſued, a mouſtrans le droit.

When it appeared upon the matter diſcuſſed, that the king had no right or title to the land he had ſeized, judgment was given in chancery, that the king's hand be amoved. Hereupon, *ouſter le main*, or *amoveas manum*, was awarded to the eſcheator, to reſtore the land, &c.

But now all wardſhips, liveries, *ouſter le mains*, &c. are taken away and diſcharged, by ſtat. 12 Car. II. c. 24.

OUSTER *le Mer*, a cauſe of excuſe or eſſoin; where a man not appearing in court upon ſummons, it is alleged, that he is beyond the ſeas.

OUT, in *Sea Language*, a term implying the ſituation of the ſails, when they are ſet or extended to aſſiſt the ſhip's courſe, as oppoſed to *in*; which is alſo applied, in the contrary ſenſe, to ſignify when ſuch ſails are furled. See IN.

OUT *of Trim*, the ſtate of a ſhip, when her beſt ſailing qualities are retarded by the injudicious arrangement of the maſts and ſails, or ſtowage of her cargo, which will conſiderably affect the ſhip's motion and ſtability.

OUT *of Winding*, in *Ship-Building*, not twiſting, but that the ſurface, whether of timber or plank, be a direct plane.

OUT, *Outſide*, or *Without*, in the *Manege*, is the contrary of *in*, *inſide*, *inner*, &c. See IN, INN, &c.

OUT *Field Land*, in *Agriculture*, a term applied to a ſort of land in Scotland, which is ſimilar to the unincloſed common field-lands in this country. Lord Dundonald remarks, that that part of the farm, called the out field-land, never receives any manure. After taking from it two or three crops of grain, it is left in the ſtate it was in at reaping the laſt crop, without ſowing thereon graſs-ſeeds for the production of any ſort of herbage. During the firſt two or three years, a ſufficiency of graſs to maintain a couple of rabbits *per* acre is ſcarcely produced. In the courſe of ſome years, it acquires a ſward; and after having been depaſtured for ſome years more, it is again ſubmitted to the ſame barbarous ſyſtem of huſbandry.

It was a ſort of diſtinction that exiſted prior to the date of incloſures, and was likewiſe general throughout England. It is wearing out faſt in Scotland, from the ſame cauſes which have operated in England.

OUTAITANI, in *Geography*, a town of Upper Siam; 80 miles N.W. of Louvo.

OUTANULLA, a town of Bengal, on the Ganges; 5 miles S. of Rajemal.

OUTAPALLAM, a town of Hindooſtan; 10 miles E.N.E. of Coimbetore.

OUTARD BAY, a bay of Canada, on the north ſide of the river St. Lawrence. N. lat. 42 2'. W. long. 68° 15'.

OUT-BOARD, in *Sea Language*, on the outſide of the ſhip, as "the out-board works," &c.

OUTCH, in *Geography*, a province of Hindooſtan, between the rivers Chunaub and Indus, near the ocean.

OUTCHACTAL, a town of Thibet; 67 miles E. of Haracher-Hotun.

OUTCHANG, a town of China, of the firſt rank, in Hou-quang, on the river Yang-tſe; 582 miles S. of Peking. N. lat. 30° 36'. E. long. 113 50'.

OU-TCHEOU, a city of China, of the firſt rank, in Quangſi. All the rivers of the province unite near this city, which joins to the province of Quang-tong, and is the key of the whole province, and the moſt conſiderable city for commerce in it. Within its juriſdiction are one city of the ſecond order, and nine of the third. The territory is partly mountainous, and partly flat. The mountains furniſh cinnabar, and an uncommon tree, called Quang-lang, which, inſtead

inſtead of pith, has a ſoft pulp, of which they make flour. N. lat. 23° 28. E. long. 110° 32'. Groſier.

OUTCHOU, a river of Thibet, which runs into the Sampoo.

OU-TCHUEN, a town of the kingdom of Corea, in King-ki; 59 miles S.S.E. of King-ki.—Alſo, a ſea-port town of China, of the third rank, in Quang-tong; 20 miles S.S.E. of Hoa.

OUTEA, in *Botany*, Aubl. Guian. 28. t. 9. Juſſ. 347, a barbarous name, contrived by Aublet out of the Caribean appellation of the tree, *Joutay*. Vahl retains this genus, as diſtinct from the *Vouapa* of the above writer, by the following character.

Calyx turbinate, five-toothed. Petals five; the uppermoſt very large. Stamens four; one of them abortive. Germen ſtalked. *Vahl. Enum. v.* 2. 38.

We are much inclined to the opinion of thoſe who judge this plant to be a *Tamarindus*. See MACROLOBIUM.

OUTEIRO, in *Geography*, a town and fortreſs of Portugal, in the province of Tras los Montes, ſeated on a mountain; 9 miles E.S.E. of Bragança.

OUTER ISLAND, an iſland on the coaſt of Labrador, in the cluſter called St. Auguſtine's Square; S.W. of Sandy iſland.

OUTFANGTHEFE, a privilege whereby a lord was enabled to call any man dwelling in his fee, but taken for felony in another place, to judgment in his own court.

The word is formed from the Saxon *ut*, *extra*, *without*; *fang*, *capio*, *vel captus*; and *theof*, *thief*, q. d. *fur extra-captus*. Spelm.

OUT-FIT, ſignifies the expences of equipping or *fitting-out* a ſhip for ſea, which includes every thing but the hull, ſuch as maſts, yards, ſails, cordage, anchors, artillery, ammunition, and all other naval furniture; with a ſufficient number of men and proviſions.

OUT-HAULER, in *Sea Language*, the rope or tackle made faſt to the tack of the jib, to haul it out by.

OUT-HOLLING, in *Agriculture*, a term provincially applied to the ſhovelling out a ditch, for the uſe of the manure it contains.

OUT-HOUSE, ſuch a building as belongs to, and is placed adjoining to, the dwelling-houſe.

OUTIMACS, in *Geography*, a tribe of American Indians, in the territory of Wayne, between lakes Michigan and St. Clair. The number of warriors is 200.

OUTIN, in *Ichthyology*, a name by which ſome call the fiſh known among authors by the name of *oxyrinchus*.

OU-TING, in *Geography*, a city of China, of the firſt rank, in Yun-nan. N. lat. 25° 53'. E. long. 102° 6'.

OUTLAW, UTLAGATUS, one deprived of the benefit of the law, or put out of the king's protection.

Bracton ſays, an outlaw forfeits every thing he has; and that, from the time of his outlawry, he wears a wolf's head, and any body may kill him *impuné*; eſpecially if he defend himſelf, or fly. But, in the beginning of king Edward III.'s reign, it was reſolved by the judges, that it ſhould not be lawful for any man, but the ſheriff alone, (having lawful warrant for it,) to put to death a man outlawed.

OUTLAWRY, or UTLAWRY, *Utlagaria*, the puniſhment of him who, being called into law, and lawfully ſought, does (after an original writ, and the writs of capias, alias & pluries, returned by a ſheriff with a non eſt inventus, and an exigent, with a proclamation awarded thereupon) contemptuouſly refuſe to appear.

He muſt alſo be called at five county court-days a month between each other; and, if he appear not in that time, *pro exlege tenebitur, cum principi non obediat, nec legi; & extunc exlegabitur; i. e.* he ſhall be pronounced to be out of the king's protection, and deprived of the benefit of the law.

The effect of which is, if he be outlawed at the ſuit of another, in a civil cauſe, he ſhall forfeit all his goods and chattels to the king, and the profits of his land, while the outlawry remains in force; and if in treaſon or felony, all his lands and tenements which he has in fee, or for life and all his goods and chattels: and in this latter caſe, the law interprets his abſence a ſufficient evidence of his guilt, and without requiring farther proof, accounts him guilty of the fact, on which enſues corruption of blood, &c. And then, according to Bracton, he may periſh without law, &c.

But now, to avoid ſuch inhumanity, it is holden that no man is entitled to kill him wantonly or wilfully; but in ſo doing, he is guilty of murder, unleſs it happens in the endeavour to apprehend him: for any perſon may arreſt an outlaw, either of his own head, or by writ or warrant of *capias utlagatum*, in order to bring him to execution. But ſuch outlawry may be frequently reverſed by writ of error; the proceeding therein being very nice and circumſtantial; and if any ſingle minute point be omitted or miſconducted, the whole outlawry is illegal, and may be reverſed: upon which reverſal, the party accuſed is admitted to plead to, and defend himſelf againſt the indictment.

If after outlawry, in civil caſes, the defendant appears publicly, he may be arreſted by a writ of *capias utlagatum*, and committed till the outlawry be reverſed: which reverſal may be had by the defendant's appearing perſonally in court, (and in the king's bench without any perſonal appearance, ſo that he appears by attorney, according to ſtatute 4 and 5 W. & M. cap. 18.) and any plauſible cauſe, however ſlight, will in general be ſufficient to reverſe it; it being conſidered only as a proceſs to compel appearance. But then the defendant muſt pay full coſts, and put the plaintiff in the ſame condition, as if he had appeared before the writ of *exigi facias* was awarded. It is ordained by Magna Charta, that no freeman ſhall be outlawed, but according to the law of the land.

A minor, or a woman, cannot be outlawed. A woman is ſaid to be *waived*, when a man is outlawed. See WAIVE.

OUTLAWRIES, *Clerk of the*. See CLERK.

OUTLICKER, or OUTLIGGER, in a *Ship*, a ſmall piece of timber, three or four yards long, as occaſion ſerves, made faſt to the top of the poop, and ſtanding right out a-ſtern: at the uppermoſt end of it is a hole, into which the ſtanding part of the ſheet is received, and made faſt through the block of the ſheet; and then again received through another block, which is ſeized to this outlicker, hard by the end of it. This is ſeldom uſed in men of war, or in great ſhips; and whenever it is made uſe of, it is becauſe the mizen-maſt is placed ſo far aft, that there is not room enough within board to hale the ſheet flat.

Outligger ſeems the true orthography of the word, which appears to be derived from the Dutch *uitlegger*, q. d. *outlier*.

OUTLINE, in *Painting* and *Drawing*, is the repreſentation of an imaginary line circumſcribing the boundary of the viſible ſuperficies of objects. It is an arbitrary mode of conveying ideas of form, which has its foundation altogether in art, and was its firſt eſſay towards perfection; and although the progreſs of painting has been ſo great, and it has ſo nearly approached to complete imitation by the help of chiaro-ſcuro and colour, yet outline, ſimple and unaided, ſtill remains duly appreciated, as efficient to produce the greateſt

greateſt and moſt eſſential purpoſes of art, *viz.* the ideas of action and expreſſion in the figures it repreſents.

There is not in fact any ſuch thing as an outline in nature. The effect which natural objects produce upon our viſion, is only that of a number of parts, or of diſtinct maſſes of form and colour, but no lines. We are obliged to aid invention in deſign by reſorting to a fiction; and the firſt and ſimpleſt means which preſents itſelf to the mind is, to ſeparate the objects we deſire to repreſent upon a plane ſurface, by marking the boundary of each, the extreme extent of its dimenſions in every direction; and this we call drawing its outline. We recollect more of a form by its boundary, or its ſeparation from other objects, than by its projecting parts; hence ariſes the ſatisfaction we receive from a line which marks that boundary, though no ſuch line in reality exiſts: our imagination immediately loſes ſight of the fallacy, and dwells upon the form within it. It is ſufficient for this purpoſe, that the exterior of the form be exhibited correct enough to excite an image of the whole; and perhaps the impreſſion a well-drawn outline makes upon the mind, is ſeldom much increaſed, if at all, by the more complete imitation of form which light and ſhade can give it.

Such an outline is in itſelf a perfect thing. It has no exemplar in nature, but is received as an arbitrary token of a ſubſtance. The image it excites, is, indeed, more or leſs perfect, according to the information or force of imagination of the beholder; but as there is no other means of compariſon than with the reaſoning powers of his own mind, its impreſſion muſt be conſidered as complete. Fill it with colour, give the form within it light and ſhade, in ſhort, attempt to make it an imitation of the real object, and it becomes ſubject to compariſons, which in well-informed minds muſt neceſſarily diminiſh its force. Its ſimplicity is the baſis of its power. The impreſſion, as far as it goes, being complete, if the other requiſites of art were not, when added to it, as perfect in their kind as the ſimple outline, it would certainly be weakened in its main points; a more full image might indeed be preſented to the eye, but that fullneſs of effect which ariſes when the mind is ſimply excited to act for itſelf, would be diſturbed, and withdrawn from the pathos of the deſign.

The value of outline will be moſt fully appreciated by thoſe who, with Lavater, have obſerved the fullneſs of character diſplayed in ſithouettes, or profile outlines filled up with only one colour; and ſtill more by thoſe who have examined the beautiful works in outline from Homer, Æſchylus, and Dante, by Mr. Flaxman. In regarding many of thoſe excellent deſigns, the mind is ſo entirely filled with figure, action, and expreſſion, that it almoſt ſhrinks with fear at the idea of an attempt at further completion.

Though outline is technically employed, or rather conſidered in the arts of deſign, generally, yet it properly belongs only to painting or drawing. Monſ. Wattelet, in the Encyclopédié des Beaux Arts, has given it as his opinion, that the ſculptor has more to do with it than the painter, becauſe, as he has obſerved, every figure wrought in the round has an outline in every view that can poſſibly be taken of it. But, ſurely, this is to confound the offices of the two arts completely. If, as we have defined it, outline is an *ideal line* raiſed by the artiſt to aſſiſt in ſeparating forms, or even to mark the extent of a form, what has the ſculptor to do with it, whoſe occupation conſiſts in producing the forms themſelves, of which in painting it is the arbitrary repreſentative? Lines are the foundation of the painter's art; form, that of the ſculptor. The latter, with the greateſt propriety, takes into his conſideration the full form of his ſubject in every point of view, and to him the outline or boundary is as much an object in the projecting, as in the receding parts; but this varying uſe of the term completely confounds the meaning of it: it is no longer the line which ſeparates objects, but the line alſo which marks forms projecting forwards; a thing abſolutely impoſſible to produce by a line, upon a flat ſurface, in many caſes at leaſt, and to be effected only by light and ſhade. Nevertheleſs, the ſculptor may uſefully convert this emblem of form to his own ſervice, by conſidering its effects in all views and combinations of his figures; or what kind of outlines his figures would produce, if taken as a model by a painter; and thus it is technically, though not correctly, employed by him; and ſo far we conſider the French editor as right, when he ſays the ſculptor muſt conſider the contour or outline of his works in every direction, and therefore has a difficult taſk to perform in producing a figure ſufficiently beautiful to bear ſuch a teſt; but when he aſſerts the opinion which gave riſe to theſe obſervations, *viz.* that the ſculptor has more to do with outline than the painter, he ſurely forgets, that the latter has to produce the imitation of contour or fullneſs of form over every part of his figures, although he has properly only one outline; and as form only requires attention, at leaſt in this reſpect, in one art, and there is a difficult combination of means requiſite to produce effect in the other, we cannot but think that the painter who aims to be correct has the ſeverer taſk of the two, when the compoſition is once decided upon.

If the art of painting were conſidered merely as an inſtrument of moral inſtruction, or even as a means of relating a fact, outline would be fully adequate to fulfil its purpoſes. But, although we are not inclined to depreciate the value of this noble art, we agree with thoſe who regard its practice more in the light of ornament than of utility, generally ſpeaking; and in that view of it, outline becomes merely a paſſive agent to prepare the way for the more ſplendid effects which chiaro-ſcuro and colour alone can produce.

It is outline which decides the character of a painting; for according to the ſtyle in which this is drawn, muſt be the one adopted in filling up the void; in other words, a figure muſt have complete uniſon in its character; both in parts which appear to come forwards, and are produced within the outline, as well as in thoſe which recede and form it.

As outline is thus eſſentially important in the art, it becomes neceſſarily an object worthy the moſt ſerious attention of the profeſſor, and we cannot recommend to a young practitioner a more uſeful leſſon than that he endeavour to attain, as early as poſſible, the power of drawing an outline free and characteriſtic; as that power can never be unaccompanied with a certain degree of freedom in the execution of a finiſhed picture: but if not attained while the hand is free, and the mind moſt alive to impreſſion, the taſk is rendered proportionably difficult.

What is called acquiring a knowledge of chaſte and true or characteriſtic outline, can be derived from no other ſource than a pure knowledge of beautiful form. The line which deſignates it is of leſs conſequence than the form it circumſcribes, yet it is an agreeable quality in an artiſt to be able to plant a pleaſing image on the mind, by a light, ſkilful, and ſteady hand. There is danger, if the line he draws be too hard, thick, or black, that the figure he intends to convey be forgot in the line: and if too weak, its force may not be adequate to produce the deſired effect.

In the works of artiſts, outline is conſidered in two diſtinct points of view. One is the ſimple and obvious ſenſe of the word, a line marking the form of any given object, ſuch as we have hitherto conſidered it: and various denominations are given to ſuch a line. It is ſaid to be *correct, free, firm, flowing,*

*flowing*, &c. or the reverſe of either of ſuch qualities. The other is a more arbitrary uſe of it, which is applied to finiſhed pictures; wherein the figures have loſt the marking properly denominated outline, and that name is then applied idcally as it is to objects in nature. Thus, figures in a picture are ſaid to have a hard outline, when the extreme parts are not blended in the ground from which they are relieved, or the ſurrounding parts; or to have a confuſed one, when they are too much ſoftened and loſt in them. The characteriſtic names given to the line itſelf are alſo applied in this caſe, and deſignate the ſtyle of deſign employed in the work; ſuch as graceful, grand, ſevere, decided, &c.; or mean, weak, mannered, incorrect, &c. &c.; for an explanation of which terms we refer to STYLE, in *Deſign*.

In the production of a picture, management of outline conſtitutes a very eſſential part of the difficulties to be contended with, both in the arrangement of the compoſition, and in the completion, for the apparent relief of the objects introduced. In the firſt place, the arrangement of forms or outlines is the main point wherein reſide the expreſſion and character of the ſubject. If it be of the terrific kind, with figures in violent agitation of mind or body, then ſtrong contraſts in the outlines, and involved forms, will enforce its influence. If it be ſimple, grand, or ſevere, the due effect will be moſt readily attained by parallel forms, or nearly ſuch, aſſiſted and united with ſlight contraſts; but if the character be merely agreeable, then lines playfully and gracefully combined, are required to produce an appropriate influence on the obſerver. In the concluſion of the work, the utmoſt attention muſt be paid to the perfection of the outlines, that they be not marked too hard, which would make the effect cutting and diſagreeable to the eye; or too much blended and weakened: in either caſe the great object of relief is counteracted. It muſt be the artiſt's ſteady endeavour to ſteer between theſe two difficulties, but how to effect that deſideratum, to acquire the wiſhed-for medium, depends ſo entirely on a nice obſervance of nature, and on inherent taſte, that it is quite impoſſible to give any poſitive rules concerning it; the painters of the Dutch and Flemiſh ſchools have beſt exemplified it in their works, to the ſtudy of which we recommend our readers.

OUTNESS, is uſed by ſome for that relation of things by which one appears out of, or at a diſtance from, another. Dr. Berkeley, in his "Eſſay on Viſion," makes uſe of the outneſs; and obſerves, that we form no notion of outneſs from the ſenſe of ſeeing merely, but only from motion.

OUT-PARTERS, in our *Ancient Writers*, were a ſort of thieves or highwaymen, on the frontiers of Scotland, who rode about to fetch in ſuch things as they could lay hold on.

OUT-POSTS, in a military ſenſe, a body of men poſted beyond the grand guard, and ſo called, as being without the rounds or limits of the camp.

OUTRAM, WILLIAM, in *Biography*, a learned Engliſh divine, was a native of Derbyſhire, and born in the year 1625. He was entered of Trinity college, Cambridge, where he took his degree of B. A., and of which he obtained a fellowſhip: he afterwards removed to Chriſt's college, where he likewiſe obtained a fellowſhip. In 1649 he took his degree of M. A., and in 1660 that of D. D. He was preſented to the rectory of St. Mary Woolnoth in London; afterwards, in 1669, he was collated to the archdeaconry of Leiceſter, and during the following year he was inſtalled prebendary of St. Peter's church in Weſtminſter. He died in 1679. He acquired celebrity by his ſkill in rabbinical learning, as well as by his acquaintance with the fathers and the ſacred ſcriptures. He was a conſtant and much admired preacher. As a writer, he is entitled to the praiſe of nervouſneſs, preciſion, and accuracy. He was author of a learned work on ſacrifices, entitled "De Sacrificiis Libri duo; quorum altero explicantur omnia Judæorum, nonnulla Gentium profanarum Sacrificia; altero Sacrificium Chriſti. Utroque Eccleſiæ Catholicæ his de rebus Sententia contra Fauſtum Socinum, et ejus Sectatores defenditur," 1677. After his death, a volume of his ſermons was publiſhed, which are good ſpecimens of pulpit compoſitions. Biog. Brit.

OUT-RIDERS, are bailiffs errant, employed by ſheriffs, or their deputies, to ſummon people in the remoteſt parts of their hundreds, to the county or hundred courts.

OUT-RIGGER, in *Ship Building*, a large ſpar, or ſtrong beam of timber, of which there are ſeveral projecting from the ſide of a ſhip, to which the maſts are ſecured in the act of *careening*.

OUT-RIGGER is alſo a ſmall boom, occaſionally uſed in the tops to thruſt out the breaſt-back-ſtays to windward, in order to increaſe their tenſion, and thereby give additional ſecurity to the topmaſt.

OUTSHI-FERMEN, in *Geography*, a town of Little Bucharia; 130 miles E. of Caſhgar.

OUTSHOU, a town of Little Bucharia; 30 miles S. of Caſhgar.

OUTWARD *Flanking Angles*. See ANGLE.

OUT-WORKS, in *Fortification*, all thoſe works made without-ſide the ditch of a fortified place, to cover and defend it. See *Fortification according to M. Vauban's method*; under the article *Military* CONSTRUCTION.

Out-works, called alſo *advanced* and *detached works*, are thoſe which not only ſerve to cover the body of the place, but alſo to keep the enemy at a diſtance, and prevent their taking advantage of the cavities and elevations uſually found in the places about the counterſcarp; which might ſerve them either as lodgments, or as rideaux, to facilitate the carrying on their trenches, and planting their batteries againſt the place. Such are ravelins, tenailles, horn-works, queue d'arondes, envelopes, crown-works. The moſt uſual of theſe are ravelins, or half-moons, formed between the two baſtions, on the flanquant angle of the counterſcarp, and before the curtain, to cover the gates and bridges.

OUVERTURE. See OVERTURE.

OVUM ANGUINUM, a name given by many authors to a foſſil, ſuppoſed by the vulgar to be the petrified egg of a ſerpent, but being really like the brontiæ and ombriæ, ſpecies of the echinites.

This ſome have ſuppoſed to be a bead of glaſs, uſed by the Druids to impoſe upon the vulgar, whom they taught to believe that the poſſeſſor would be fortunate in all his attempts, and that it would give him the favour of the great. See ANGUINUM *Ovum*.

OVUM *Philoſophicum*, or *Chymicum*, is a glaſs body of an oval form, reſembling an egg: uſed for the ſublimation of mercury.

OVUM *Polypi*, in *Natural Hiſtory*, a name given by ſome of the earlier writers to the papyraceous or thin-ſhelled nautilus. The reſemblance of the body and arms of the fiſh which inhabits this ſhell, with thoſe of the ſea-polypus, gave occaſion to their ſuppoſing this creature the ſame animal, not yet got out of the egg. The ſhell of this ſpecies being very thin, and looking like an egg-ſhell, gave farther countenance to this error in leſs knowing ages.

OVUM *Rumphii*, the name of a ſpecies of porcelain ſhell, of the oblong kind, called an *egg*, from its ſhape, by that author. See PORCELAIN *Shell*.

OVUTSI, or Ouvusti, in *Geography*, a town of Japan, in the iſland of Xicoco. N. lat. 34 8'. E. long. 135 20'.

OUZE, in *Agriculture*, a ſort of depoſit made by the ſea, which is often very ſterile and unproductive, but ſometimes the contrary.

OUZELL, Brook, in *Ornithology*. See Rallus *Aquaticus*.

Ouzell, *Ring*. See Turdus *Torquatus*.

Ouzell, *Roſe* or *Carnation-coloured*. See Turdus *Roſeus*.

Ouzell, *Water*. See Sturmus *Cinclus*.

OUZOUER *ſur Loire*, in *Geography*, a town of France, in the department of the Loiret, and chief place of a canton, in the diſtrict of Gien; 6 miles S.E. of Gien. The place contains 686, and the canton 5564 inhabitants, on a territory of 275 kiliometres, in 8 communes.

OW, or Awe, *Loch*, a lake in Argyleſhire, Scotland, extends about thirty miles in length, and is in ſome places two miles broad; but its uſual width does not exceed one mile. It is an uncommonly fine expanſe of water, and little inferior to loch Lomond in the beauty of its ſcenery. A great part of its banks exhibits lofty mountains covered with wood; and within its boſom are many little iſlands ornamented with trees and picturefque ruins. On Iniſh-Chonnel are the remains of an ancient caſtle belonging to the Argyle family; and on Troach-Elan are veſtiges of another fortreſs, which was granted, with ſome contiguous lands, to the chief of the clan of Mac-Naughton, by king Alexander III., on condition that he ſhould entertain the Scottiſh monarch whenever he paſſed that way. At a more remote period this latter iſland was the Heſperides of Scotland, and the fatal attempt of Troach, to gather its delicious fruit for his beloved Mego, is handed down from age to age in a beautiful Celtic tale, after the manner of Oſſian. "The fair Mego longed for the delicious fruit of the iſle guarded by a dreadful ſerpent. Troach, who had long loved the maid, goes to gather the fruit. By the ruſtling of the leaves the ſerpent was awaked from his ſleep. It attacked the hero, who periſhed in the conflict. The monſter was alſo deſtroyed. Mego did not long ſurvive the death of her lover."

The ſurface of Loch-Awe is 108 feet above the level of the ocean. Numerous rivulets diſcharge themſelves into it on both ſides, and, what is unuſual, it receives a large ſtream at each extremity, emptying itſelf laterally by the river Awe into loch Etive, an arm of the ſea to the north, at a place called Bunaw. This lake abounds with ſalmon, trout, and char. Eels are likewiſe extremely plentiful, but held in great abhorrence by the natives, who regard them as water ſerpents, and unfit for the food of man.

On a rocky point, projecting into the lake, near its eaſtern end, are ſeated the venerable ruins of Caſtle-Kilchurn, which was built in 1440, by the lady of ſir Colin Campbell, knight of Rhodes, and anceſtor of the Breadalbane family, while her huſband was engaged in the holy wars. Since that period, however, many additions have been made to its original extent, by ſucceſſive poſſeſſors. In 1745, it was fitted up for the reception of a royal garriſon to ſecure the peace and tranquillity of the country, but its maſſive walls are now rapidly falling to ruin, and offer to the contemplative mind a melancholy monument of the mutability of earthly grandeur, and of the unavoidable decay of the moſt durable works of human art. Beauties of Scotland, vol. v. Pennant's Tour in Scotland, 4to. 1790.

OWANTY, a town of Lithuania, in the palatinate of Wilna; 16 miles E. of Wilkomierz.

OWARI, a town of Japan, in the iſland of Niphon, ſituated in a bay to which it gives name. N. lat. 35° 30' E. long. 137 50'.

OWASCO, a lake of America, partly in the towns of Aurelius and Scipio, in Onondago county, New York, about 11 miles long and one broad; communicating with Seneca river on the N. by a ſtream which runs through the town of Brutus.

OWCE, in *Agriculture*, a provincial word applied to the ox.

OWCH, in *Geography*, a town of Turkeſtan, on a river which runs into the Sihon; 30 miles S.S.E. of Andagan.

OWCZE, a town of Poland, in the palatinate of Podolia; 40 miles W. of Kaminiec.

OWEGO, a poſt-town of America, in Tioga county, New York, on the N.W. bank of the E. branch of the Sufquehannah; 30 miles W. of Union, at Tioga point, containing 1284 inhabitants.

Owego *Creek*, a creek of Tioga county, which ſerves as the E. boundary of the townſhip of its name.

OWELTY, or Ovelty *of Services*, in our *Law Books*, an equality of ſervices; as when the tenant paravail owes as much to the meſne, as the meſne does to the lord paramount.

OWEN, John, in *Biography*, a learned Engliſh nonconformiſt divine of the independent denomination, was deſcended from a reſpectable family in North Wales, and born in 1616, at Hadham in Oxfordſhire. At Oxford he received his grammatical learning, and ſo rapid was the progreſs which he made, that at twelve years of age he was admitted a ſtudent at Queen's college. He purſued his ſtudies with incredible diligence, allowing himſelf, for ſeveral years, not more than four hours ſleep in a night. He was, at the ſame time, exceedingly attentive to his health, and occaſionally indulged in ſuch recreations as were proper for ſo robuſt a conſtitution as he enjoyed, ſuch as leaping, throwing the bar, ringing of bells, and ſimilar hardy exerciſes. He was admitted to the degree of B. A. in 1632, and commenced M. A. in 1635. Soon after this, archbiſhop Laud having enjoined the obſervance of ſome new regulations with which Mr. Owen was diſſatisfied, he refuſed ſubmiſſion to them. This conduct greatly offended his uncle, to whom he was already under important obligations for maintaining him at college, and to whom he looked for future aſſiſtance. Being ſuſpected of favouring Puritaniſm, many of his beſt friends abandoned him, and in 1637 his ſituation at college was rendered ſo uneaſy, that he found himſelf obliged to leave it. He was now ordained prieſt, and became chaplain to ſir Robert Dormer of Aſcot in Oxfordſhire, as well as tutor to his eldeſt ſon. Afterwards he was appointed chaplain to lord Lovelace, in whoſe family he reſided at the commencement of the civil wars, when he openly avowed himſelf a friend to the parliamentary cauſe. This conduct was ſo highly reſented by his uncle, who was a zealous royaliſt, that he immediately diſcarded him, ſettled his eſtate upon another perſon, and died without bequeathing him any thing. Lord Lovelace, though he had joined the king's party, continued to treat his chaplain with great civility; but when that nobleman went into the army, Mr. Owen left his houſe, went to London, and became a perfect convert to the principles of the non-conformiſts. Mr. Owen firſt made himſelf known as an author in 1642, by a work entitled "A Diſplay of Arminianiſm," which laid the foundation of his future advancement. He was almoſt immediately preſented to the living of Fordham in Eſſex; and in a ſhort time afterwards to that of Coggleſhall. At this latter place he renounced the Preſbyterian principles, joined



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the Independents, and formed a church, according to their ſyſtem of diſcipline. Upon the prevalence of the independent party, he was ſent to preach before the parliament on one of the faſt-days in 1646. On this and other occaſions Mr. Owen's ſervices were ſo acceptable to the Commons, that he was afterwards frequently appointed to preach before them, and became the favourite of Fairfax and Cromwell. With the latter he went to Ireland, where he remained a few months, and then returned. He was now called again to preach at Whitehall, and very ſoon after accompanied the protector into Scotland. In 1651 he was promoted to the deanery of Chriſtchurch college in Oxford; when he went to reſide there Cromwell was the chancellor of the univerſity, and he nominated Mr. Owen as his vice-chancellor. In 1653 he was created doctor of divinity by diploma: by virtue of his office as vice-chancellor, he endeavoured to put down habits, formalities, and all ceremonies, notwithſtanding he had before taken an oath to obſerve the ſtatutes, and maintain the privileges of the univerſity. In many reſpects Anthony Wood ſpeaks very diſparagingly, and even contemptuouſly, of Dr. Owen; but other writers, not diſpoſed to eulogize the doctor, applaud the care which he diſplayed in maintaining good diſcipline in the univerſity, and the moderation which he exerciſed towards the king's party. In 1654. when Cromwell ſummoned a parliament, Dr. Owen, it is ſaid by Wood, became a candidate for repreſenting the univerſity, and was elected. but ſat only a very ſhort time in the houſe. This circumſtance is, however, doubted, inaſmuch as it is not referred to by Calamy and other hiſtorians of that period. When Richard Cromwell ſucceeded his father as chancellor of the univerſity, Dr. Owen was removed from the poſt of vice-chancellor, as he was from Richard's favour when he became protector: this is attributed chiefly to the hoſtility of the Preſbyterian party. Dr. Owen was, indeed, one of the leading men in the aſſembly of the Independents, which met at the Savoy in October 1658, and he had a principal ſhare in drawing up a confeſſion of their faith and diſcipline, in oppoſition to the Preſbyterians. While ſteps were purſuing to bring about the reſtoration in 1659, he was ejected from the deanery of Chriſtchurch; upon which he retired to Hadham, where he purchaſed a good eſtate with a handſome houſe. Here he lived for ſome time, preaching in private to many friends, who came from Oxford to hear him, till he was driven away by the ſoldiery. He now removed from place to place, till at length he arrived in London, where, by one of his publications, he became noticed by the lord chancellor Clarendon, who offered to give him preferment, provided he would conform to the church, which the doctor thought proper to decline. From the interruptions to which he was frequently ſubject, he prepared to embark for New England, but was ſtopped by an expreſs order of council. He, about the ſame time, received an offer of a profeſſorſhip of divinity in the United Provinces, which he declined. He continued preaching in a private manner as long as he was able, though it was frequently at the riſk of his perſonal ſafety. In the midſt of the perſecutions of that period, the moderation and learning which he diſplayed procured for him the reſpect and eſteem of ſeveral perſons of honour and quality, who took delight in his converſation; particularly of the earl of Orrery and Angleſea, lord Willoughby of Parham, lord Berkeley, and ſir John Trevor, one of the ſecretaries of ſtate. What is ſtill more wonderful, the king, and James duke of York, paid him particular attention. In one of his conferences with the king, his majeſty aſſured him that he was a friend to liberty of conſcience, and was ſenſible that the diſſenters had met with injurious treatment, at the ſame time preſenting him with a thouſand guineas to diſtribute among thoſe who had ſuffered moſt by the late ſeverities, which royal donation the doctor received with thankfulneſs, and applied with the greateſt fidelity. Dr. Owen died at Ealing on the 24th of Auguſt 1683, in the 67th year of his age. Dr. Owen was tall and graceful in perſon, of a grave and majeſtic countenance, and he poſſeſſed a genteel deportment and manners. His temper was ſerene and even. his diſpoſition liberal, generous, and friendly, and his conduct in the domeſtic relations was peculiarly amiable and affectionate. Of his ardent and unaffected piety, and of his firm and undeviating integrity, his whole hiſtory affords ſufficient evidence. His works are numerous; the chief are "An Expoſition of the Epiſtle to the Hebrews," 4 vols. fol.; "Diſcourſe on the Holy Spirit;" "Treatiſe on Original Sin." All his various writings amount to ſeven vols. in folio, twenty in quarto, and about thirty in octavo. To his great learning and almoſt unceaſing induſtry, his works bear abundant evidence. Dr. Calamy ſays, "he was a man of univerſal reading, and had digeſted it. He was eſpecially converſant in thoſe ſciences that are aſſiſtant to divinity, and maſter of them in an unuſual degree. He was reckoned the brighteſt ornament of the univerſity of Oxford." But another biographer ſays, "he was a perfect maſter of the Latin, Greek, and Hebrew tongues. He was a great philoſopher, and alſo well read in the civil law. A great hiſtorian, having a perfect comprehenſion of church hiſtory in particular. He was thoroughly verſed in all the Greek and Latin poets, well ſkil'ed in the rabbis, and made great uſe of them as there was occaſion." Anthony Wood, though he has treated his memory with the moſt opprobrious language, ſays, "he had a very graceful behaviour in the pulpit, an eloquent elocution, a winning and inſinuating deportment, and could, by the perſuaſion of his oratory, in conjunction with ſome other outward advantages, move and wind the affections of his admiring auditory almoſt as he pleaſed." Calamy's Ejected Miniſters. Biog. Brit. Granger's Biog. Hiſt. of England.

Owen, John, was a native of Caermarthenſhire, and received his education at Wincheſter ſchool, under Dr. Bilſon. In 1584 he was admitted a fellow of New college, Oxford, where he continued till 1591, when he was appointed maſter of a ſchool near Monmouth. In 1594 he obtained the maſterſhip of the free-ſchool at Warwick, where he made himſelf celebrated by his ſkill in Latin poetry, eſpecially in the epigrammatic kind. He is ſaid to have experienced the poet's fate of perpetual poverty, but he met with a kind friend in biſhop and lord-keeper Williams, by whom he was chiefly ſupported in the later years of his life. He died in 1622, and was buried, at biſhop Williams' expence, in St. Paul's cathedral. His epigrams have been collected in twelve books, and have been publiſhed ſeveral times. It has been ſaid of them, that they are only inferior to thoſe of Martial; but other critics ſay, that "in ſome of his pieces he imitates the pointed turn of Martial with ſucceſs, but the greater number have little to recommend them except the purity and elegant ſimplicity of the language." Several have been tranſlated into the French and Engliſh languages. We ſhall tranſcribe the one which is noticed for containing an elegant compliment to ſir Thomas Overbury's poem, entitled "The Wife," to which we have before referred. See Overbury.

"Uxorem culto deſcribis carmine talem
Qualem oratorem Tullius ore potens;
Qualem deſcribis, quamvis tibi nuberet uxor
Æqualis tali non foret illa virô." Biog. Brit.

Owen, Henry, a learned divine of the church of Eng-

land, was born near Dolgelly, in Merionethſhire, in the year 1716. He was inſtructed in grammar learning at Ruthin ſchool, in Denbighſhire, and at the age of nineteen he entered himſelf of Jeſus college, Oxford. Among the favourite ſubjects of his purſuit, on his entrance upon academic ſtudies, was that of the mathematics, which he proſecuted with great ardour, and the moſt ſerious application. Having taken his degrees, he turned his attention to the ſtudy of phyſic. For three years he practiſed as a phyſician, which profeſſion he quitted on account of want of health, and then directed his views to the clerical calling. In early life he was chaplain to ſir Mathew Featherſtonehaugh, who preſented him to the living of Torling, in Eſſex. In the year 1748 he publiſhed his "Harmonia Trigonometria, or a ſhort Treatiſe on Trigonometry." In 1750 he was preſented to the rectory of St. Olave, Hart-ſtreet, in the city of London, when he reſigned his living of Torling; after this he was appointed chaplain to the biſhop of Landaff, and in 1753 he proceeded doctor of phyſic at Oxford. Dr. Owen's next publication appeared in 1755, entitled "Obſervations on the Scripture Miracles." This was followed, in 1760, by "Obſervations upon the Four Goſpels." His other principal works were, "An Enquiry into the Septuagint Verſion;" "Sermons preached at Boyle's Lectures," in two vols.; "An Introduction to Hebrew Criticiſm;" "The Modes of Quotation uſed by the evangelical Writers explained and vindicated:" in this work the author chiefly examines thoſe quotations which have been introduced by the evangeliſts, in order to point out the intimate connection between the events of the life of Chriſt and the prophecies recorded in the Old Teſtament; and he concludes with proving that the prophecies in queſtion were juſtly applied to Chriſt, or that they are to be conſidered as referring to him, rather than to ſubjects more nearly connected with the times and the ſituations of the prophets. Beſides the articles already mentioned, Dr. Owen was the author of "A Collation of the Account of the Dedication of the Temple," in Bowyer's and Nichols's "Origin of Printing;" "Remarks on the Time employed in Cæſar's two Expeditions into Britain," in the ſecond volume of the "Archæologia." Dr. Owen had a conſiderable ſhare in preparing for the public eye Mr. Bowyer's "Conjectures on the New Teſtament;" and he aſſiſted Mr. Nichols in editing the 4to. edition of Mr. Bowyer's Greek teſtament in 1783, as we learn from this obſervation in the inſcription of it to Dr. Owen: "Ipſius auxilio concinnatam." He died in the year 1795, in the eightieth year of his age. New Ann. Regiſter.

Owen, in *Geography*, a town of Wurtemberg; 18 miles S.E. of Stuttgart.

Owen's *Bay*, *St.*, a bay on the W. coaſt of the iſland of Jerſey, with a town or village of the ſame name; 6 miles W.N.W. of St. Helier.

OWER-Gate, in *Rural Economy*, a provincial word ſignifying a ſtile place, or imperfect gap in a hedge, and alſo a ſtepping place over a brook.

Ower-*Welt*, a provincial word applied to a ſheep, which gets laid upon its back in a hollow.

OWEY, in *Geography*, a ſmall iſland of the Atlantic, near the N.W. coaſt of Ireland. N. lat. 55° 3′. W. long. 8° 21′.

OWHARREE, a harbour on the W. coaſt of Huaheine, one of the Society iſlands, in the South Pacific ocean. S. lat. 16° 54′. W. long. 151° 8′.

OWHYHEE, an iſland in the North Pacific ocean, diſcovered by captain Cook, Nov. 30, 1778. This is the eaſternmoſt, and by far the largeſt of the group called Sandwich iſlands; it is of a triangular ſhape, and nearly equilateral. The following particulars relating to this iſland are extracted from the account of it by Capt. King, who viſited it again after the death of Capt. Cook, in March 1779. (See Cook's Third Voyage, vol. iii.) The angular points make the north-eaſt and ſouth extremities, of which the northern is in N. lat. 20° 17′. E. long. 204° 2′: the eaſtern in N. lat. 19° 34′. E. long. 205° 6′.; and the ſouthern extremity in N. lat. 18° 54′. E. long. 204° 15′. Its greateſt length, which lies in a direction nearly N. and S., is twenty-eight leagues and a half, its breadth is twenty-four leagues, and it is about 255 geographical, or 293 Engliſh miles in circumference. The whole iſland is divided into ſix large diſtricts: Amakooa and Aheedoo, which lie on the N.E. ſide; Apoona and Kaoo on the ſouth eaſt; Akona and Koaarra on the weſt. The diſtricts of Amakooa and Aheedoo are ſeparated by a mountain, called *Mounah Kaah*, or *The Mountain Kaah*, which riſes in three peaks, perpetually covered with ſnow, and may be clearly ſeen at 40 leagues diſtance. To the N. of this mountain the coaſt conſiſts of high and abrupt cliffs, down which fall many beautiful caſcades of water. We were once flattered with the hopes of meeting with a harbour round a bluff head, in N. lat. 20° 10′, and E. long. 204° 26′; but on doubling the point, and ſtanding cloſe in, we found it connected, by a low valley, with another high head to the north-weſt. The country riſes inland with a gentle aſcent, is interſected by deep narrow glens, or rather chaſms, and appeared to be well cultivated, and ſprinkled over with a number of villages. The ſnowy mountain is very ſteep, and the lower part of it covered with wood. The coaſt of Aheedoo, which lies to the ſouth of Mouna Kaah, is of a moderate height, and the interior parts appear more even than the country to the N.W., and leſs broken by ravines. Off theſe two diſtricts we cruized for almoſt a month; and, whenever our diſtance from the ſhore would permit it, were ſure of being ſurrounded by canoes laden with all kinds of refreſhments. We had frequently a very heavy ſea, and great ſwell, on this ſide of the iſland, and as we had no ſoundings, and could obſerve much foul ground off the ſhore, we never approached nearer the land than two or three leagues, excepting on the occaſion already mentioned. The coaſt to the N.E. of Apoona, which forms the eaſtern extremity of the iſland, is low and flat; the acclivity of the inland parts is very gradual, and the whole country covered with cocoa-nut and bread-fruit trees. This, as far as we could judge, is the fineſt part of the iſland, and we were afterward told, that the king had a place of reſidence here. At the ſouth-weſt extremity the hills riſe abruptly from the ſea-ſide, leaving but a narrow border of low ground towards the beach. We were pretty near the ſhore at this part of the iſland, and found the ſides of the hills covered with a fine verdure; but the country ſeemed to be very thinly inhabited. On doubling the eaſt point of the iſland, we came in ſight of another ſnowy mountain, called *Mouna Roa*, or *The Extenſive Mountain*, which continued to be a very conſpicuous object all the while we were ſailing along the ſouth-eaſt ſide. It is flat at the top, making what is called by mariners table-land: the ſummit was conſtantly buried in ſnow, and we once ſaw its ſides alſo ſlightly covered for a conſiderable way down, but the greateſt part of this diſappeared again in a few days. According to the tropical line of ſnow, as determined by Mr. Condamine, from obſervations taken on the Cordilleras, this mountain muſt be at leaſt 16,020 feet high, which exceeds the height of the Pico de Teyde, or Peak of Teneriffe, by 724 feet, according to Dr. Heberden's computation; or 3680, according to that of the chevalier de Borda. The peaks of Monna Kaah appeared to be about half a mile high, and as they are entirely covered with ſnow, the altitude of their ſummits cannot be leſs than 18,400 feet. But it is probable that both theſe

mountains may be conſiderably higher. For, in inſular ſituations, the effects of the warm ſea-air muſt neceſſarily remove the line of ſnow, in equal latitudes, to a greater height than where the atmoſphere is chilled on all ſides, by an immenſe tract of perpetual ſnow. The coaſt of Kaoo preſents a proſpect of the moſt horrid and dreary kind: the whole country appearing to have undergone a total change from the effects of ſome dreadful convulſion. The ground is every where covered with cinders, and interſected in many places with black ſtreaks, which ſeem to mark the courſe of a lava that has flowed, not many ages back, from the mountain Roa to the ſhore. The ſouthern promontory looks like the mere dregs of a volcano. The projecting head-land is compoſed of broken and craggy rocks, piled irregularly on one another, and terminating in ſharp points. Notwithſtanding the diſmal aſpect of this part of the iſland, there are many villages ſcattered over it, and it certainly is much more populous than the verdant mountains of Apoona. Nor is this circumſtance hard to be accounted for. As theſe iſlanders have no cattle, they have conſequently no uſe for paſturage, and therefore naturally prefer ſuch ground as either lies more convenient for fiſhing, or is beſt ſuited to the cultivation of yams and plantains. Now amidſt theſe ruins there are many patches of rich ſoil, which are carefully laid out in plantations; and the neighbouring ſea abounds with a variety of moſt excellent fiſh, with which, as well as with other proviſions, we were always plentifully ſupplied. Off this part of the coaſt we could find no ground leſs than a cable's length from the ſhore, with 160 fathoms of line, excepting in a ſmall bight to the eaſtward of the ſouth point, where we had regular ſoundings of fifty and fifty-eight fathoms, over a bottom of fine ſand. Before we proceed to the weſtern diſtricts, it may be neceſſary to remark, that the whole eaſt ſide of the iſland, from the northern to the ſouthern extremity, does not afford the ſmalleſt harbour or ſhelter for ſhipping. The S.W. parts of Akona are in the ſame ſtate with the adjoining diſtrict of Kaoo; but farther to the north, the country has been cultivated with great pains, and is extremely populous. In this part of the iſland is ſituated *Karakakooa Bay*, which ſee. Along the coaſt nothing is ſeen but large maſſes of lag, and the fragments of black ſcorched rocks; behind which the ground riſes gradually for about two miles and a half, and appears to have been formerly covered with looſe burnt ſtones. Theſe the natives have taken the pains of clearing away, frequently to the depth of three feet and upwards; which labour, great as it is, the fertility of the ſoil amply repays. Here, in a rich aſhy mould, they cultivate ſweet potatoes, and the cloth plant. The fields are incloſed with ſtone fences, and are interſperſed with groves of cocoa-nut trees. On the riſing ground beyond theſe the bread-fruit trees are planted, and flouriſh with the greateſt luxuriance. Koaara extends from the weſternmoſt point of the northern extremity of the iſland; the whole coaſt between them forming an extenſive bay, called *Toe-yah-yah*, which is bounded to the N. by two very conſpicuous hills. Toward the bottom of this bay, there is foul, corally ground, extending upwards of a mile from the ſhore, without which the ſoundings are regular, with good anchorage, in twenty fathoms. The country, as far as the eye could reach, ſeemed fruitful and well inhabited, the ſoil being in appearance of the ſame kind with the diſtrict of Kaoo, but no freſh water is to be got here. A party advanced into the land, to the diſtance of three or four miles from the bay: they found the country as before deſcribed; the hills afterwards roſe with a more ſudden aſcent, which brought them to the extenſive plantations that terminate the view of the country, as ſeen from the ſhips. Theſe plantations conſiſt of the tarrow or eddy-root, and the ſweet potatoe, with plants of the cloth tree, neatly ſet out in rows. The walls that ſeparate them are made of the looſe burnt ſtones which are got in clearing the ground; and being entirely concealed by ſugar canes, planted cloſe on each ſide, make the moſt beautiful fences that can be conceived. The party ſtopped for the night at the ſecond hut they found amongſt the plantations, about ſix or ſeven miles, as they eſtimated the diſtance, from the ſhips. The proſpect from this ſpot was very delightful; they ſaw the ſhips in the bay before them; to the left a continued range of villages, interſperſed with groves of cocoa-nut trees, ſpreading along the ſea-ſhore; a thick wood ſtretching out of ſight behind them; and to the right an extent of ground laid out in regular and well-cultivated plantations, as far as the eye could reach. Near this ſpot, at a diſtance from any other dwelling, the natives pointed out to them the reſidence of an hermit, who, as they ſaid, had formerly been a great chief and warrior, but had long ago quitted the ſhores of the iſland, and now never ſtirred from his cottage. They proſtrated themſelves as they approached him, and afterwards preſented to him a part of ſuch proviſions as they had brought with them. His behaviour was eaſy and cheerful; he ſcarcely ſhewed any marks of aſtoniſhment at the ſight of our people, and though preſſed to accept of ſome of our curioſities, he declined the offer, and ſoon withdrew to his cottage. He was deſcribed as by far the oldeſt perſon any of the party had ever ſeen, and judged to be, by thoſe who computed his age, at the loweſt, upwards of 100 years old. Here the travellers found the cold ſo intenſe, that they could get but little ſleep, and the natives none at all; both parties being diſturbed the whole night by continued coughing. This extraordinary rigour of cold was aſcribed to the eaſterly wind, which blew freſh over the ſnowy mountains. They ſtill proceeded, and entered a thick wood, through which their progreſs was ſlow; and after they had advanced about ten miles in the wood, they found themſelves, on a ſudden, within ſight of the ſea, and at no great diſtance from it. They therefore retraced their ſteps for ſix or ſeven miles to an unoccupied hut, where they had left three of the natives and two of their own people, and the ſmall ſtock that remained of their proviſions. Here they ſpent the ſecond night, ſuffering much from the intenſe cold. Their proviſions being exhauſted, they found it adviſable to return to ſome of the cultivated parts of the iſland, and quitted the wood by the ſame path on which they had entered it. Having obtained a freſh ſupply, they marched along the ſkirts of the wood for ſix or ſeven miles, and entered it again, purſuing their courſe for the firſt three miles through foreſts of lofty ſpice-trees. In paſſing through the woods, they found many canoes half finiſhed, and here and there a hut; but ſaw none of the inhabitants. In their farther progreſs, they experienced the want of water, as in a courſe of 20 miles they had met with no ſprings. In the night the cold was more intenſe than they had found it before, which prevented their deriving much refreſhment from reſt and ſleep. At length they determined to return to the ſhips, after taking a view of the country from the higheſt trees which the place afforded. From this elevation they ſaw themſelves ſurrounded, on all ſides, with wood towards the ſea; they could not diſtinguiſh, in the horizon, the ſky from the water; and between them and the ſnowy mountain, which they had once intended to aſcend and examine, was a valley about ſeven or eight miles broad, above which the mountain appeared only as a hill of a moderate ſize. Finding themſelves about 9 miles N.E. of the ſhips, they directed their march toward them through the plantations.

As

As they paſſed along, they did not obſerve a ſingle ſpot of ground, that was capable of improvement, left unplanted; and, indeed, it appeared from their account hardly poſſible for the country to be cultivated to greater advantage for the purpoſes of the inhabitants, or made to yield them a larger ſupply of neceſſaries for their ſubſiſtence. They were ſurprized to meet with ſeveral fields of hay; and on enquiring to what uſe it was applied, were told, it was deſigned to cover the young tarrow grounds, in order to preſerve them from being ſcorched by the ſun. They ſaw a few ſcattered huts among the plantations, which ſerved for occaſional ſhelter to the labourers; but no villages at a greater diſtance than four or five miles from the ſea. It was on this iſland that the celebrated captain Cook fell a ſacrifice to a miſunderſtanding, or ſudden impulſe of revenge, in the natives, on Sunday the 14th of February, 1779. See his biographical article.

OWL, in *Ornithology*. See STRIX.

OWL, *Churn*, See CAPRIMULGUS *Europæus*.

OWL *Fiſh*, or *Sea Owl*, in *Ichthyology*, an Engliſh name for the lumpus, more frequently called the *lump-fiſh*; and by the Scotch the *cock-paddle*. See CYCLOPTERUS *Lumpus*.

OWL *Pigeon*, in *Ornithology*, the name of a particular ſpecies of pigeon, called by Moore the *columba bubo nominata*. It is a ſmall and ſhort-bodied pigeon; it has a ſhort round head, and has a ſeries of feathers that ſeparate and open two ways upon the breaſt: but its moſt remarkable character is its beak, the upper chop of which is bent, and hooked over like an owl's: this is the occaſion of its name. It is of various colours, as white, blue, or black, but is always of one colour, never pied.

OWL's *Head*, in *Geography*, a cape on the S.E. coaſt of Nova Scotia. N. lat. 44 42'. W. long. 60° 50'.

OWLAK, a town of Hindooſtan, in Rohilcund; 12 miles E. of Biſſowia.

OWLER, a maſter of a ſhip, or other perſon, who conveys wool, or other prohibited goods, in the night, to the ſea-ſide, in order to ſhip them off contrary to law.

The name is derived hence, that like owls they only ſtir abroad in the night-time.

OWLING, in *Law*, ſo called from its being uſually carried on in the night, denotes the offence of tranſporting wool or ſheep out of this kingdom, to the detriment of its ſtaple manufacture. This was forbidden at common law (Mir. c. 1. § 3.), and more particularly by ſtatute 11 Edw. III. c. 1. when the importance of our woollen manufacture firſt became an object of attention; and there are now many later ſtatutes relating to that offence, the moſt uſeful and principal of which are thoſe enacted in the reign of Elizabeth and ſince. The ſtatute 8 Eliz. c. 3. makes the tranſportation of live ſheep, or embarking them on board any ſhip, for the firſt offence, forfeiture of goods, and impriſonment for a year, and that at the end of the year the left hand ſhall be cut off in ſome public market, and ſhall there be laid up in the moſt open place; and the ſecond offence is felony. The ſtatutes 12 Car. II. c. 32. and 7 & 8 W. III. c. 28. make the exportation of wool, ſheep, or fuller's earth, liable to pecuniary penalties, and the forfeiture of the intereſt of the ſhip and cargo by the owners, if privy; and confiſcation of goods, and three years' impriſonment to the maſter and all the mariners. And the ſtatute 4 Geo. I. c. 1. (amended and further enforced by 12 Geo. II. c. 21. and 19 Geo. II. c. 34.) makes it tranſportation for ſeven years, if the penalties be not paid.

OWNER, the proprietor of a ſhip, by whom ſhe is freighted to the merchant for conveyance by ſea.

OWRUCZE, in *Geography*, a town of Lithuania, in the palatinate of Kiev; 96 miles N.W. of Kiev.

OWSCRAW, a town of Hindooſtan, in Bahar; 20 miles W. of Rotas.

OWSE, among tanners, is oaken bark, beaten or ground ſmall to ſerve in the preparation of leather.

OX, Bos, in *Zoology*, a genus of the *Mammalia Pecora*, the characters of which are that it has hollow perſiſtent horns, which are ſmooth, and bend outwards and forwards in a ſemilunar form. It has eight cutting teeth in the lower jaw, none in the upper, and no tuſks. The animals of this genus are extremely uſeful to mankind, ſerving as beaſts of draught and burden, and furniſhing for food beef, milk, cheeſe, butter, curds and whey; their ſkins make excellent leather for many purpoſes (ſee HIDE); the fat is uſed for making ſoap and candles; the horns are manufactured into a variety of uſeful utenſils; and even the hoofs, bones, and hair are converted to uſe. They principally delight in flat paſtures, avoiding woods and ſteep hills; they fight by puſhing with their horns; their voice is denominated "lowing" or "bellowing;" the male is called *Bull* (which ſee); when emaſculated, ox: the female, *Cow* (which ſee); when ſpayed, heifer; the young *Calf* (which ſee): and, like the ſheep, it has various appellations for different ages and circumſtances, as ſteer, ſtot, runt, keillie, ſtirk, ſeg, and many others, which vary in different diſtricts.

The common ox, or Bos *taurus*, has round horns, which are curved outwards; and a pendant dewlap. This ſpecies inhabits almoſt every part of the world, either in a wild or domeſticated ſtate. It is ſubject to great variety in form, colour, and figure of the horns. For the varieties, both of the wild and domeſticated ox or bos, and other ſpecies; ſee TAURUS.

Ox, in *Rural Economy*, the name of a well-known animal, produced from the male of the cattle kind by caſtration. See CATTLE.

Oxen, like other domeſtic animals, vary much in colour; but whatever be the colour, it ſhould be gloſſy, thick, and ſmooth to the touch; for if it be harſh, tough, or thin, there is reaſon to ſuppoſe that the animal is out of order, or at leaſt not of a ſtrong conſtitution.

Mr. Marſhall made many experiments on the utility of oxen in the plough, and ſtrongly recommends the uſe of them for moſt draught purpoſes, as no horſes draw better. He remarks that full-grown oxen in general are much longer made than horſes, too long for common ſhafts, not having room to back the cart; for which reaſon the ſhafts ſhould be made long enough to admit them. Ox-collars are ſtrongly recommended. See COLLARS.

The comparative merits and demerits of beaſts of labour, depend, in his opinion, on their firſt coſt, their keep, their work, and their value after working. A powerful, handſome, ſix-years'-old ox, might formerly be purchaſed for ten or twelve guineas; but a powerful, handſome, ſix-years'-old horſe, would coſt from twenty to twenty-four guineas. Suppoſe that ten guineas a-head are ſaved by purchaſing oxen inſtead of horſes, and that a farmer has occaſion for three teams, he will have an addition, every ten or twelve years, of one hundred and twenty guineas to ſtock and manage his farm with. Their keep depends, in ſome meaſure, on the prices of hay and corn, and on the ſize and voraciouſneſs of the beaſt to be fed. Taking into the account the unavoidable pilfering of carters, perhaps, on an equality of time, an ox may be kept at two-thirds of the expence of a large cart-horſe. In their work, it is unneceſſary here to contend for ſuperiority, but you may aſpire at equality. Oxen are equally tractable and equally verſatile. Their ſtrength depends

pends upon their age and breed, and their activity on their make and ſtrength. A two-years'-old ox is as worthleſs in work as a two-years'-old horſe; and the working of either is unpardonable. An ox does not arrive at full ſtrength, eſpecially if worked while young, until he be ſix years old. At that age, a large deep-cheſted ox is equal in ſtrength to a ſtrong well-made cart-horſe. Mr. Marſhall adds, that he is not ſo partial to oxen as to imagine that they can do whatever horſes can do: he is nevertheleſs nearly poſitive, that whatever farming horſes do, oxen (of a proper age and properly managed) can do. On the road they are, beyond all doubt, equal to horſes, and at plough they are not inferior, except their work be very heavy. In heavy work they will not ſtrive like horſes, but will, in defiance, keep their ſteady pace. In this point of view, and in this only, oxen are unequal to horſes. Indeed he never worked oxen all the year round, as horſes are done, but he has always given them a month's marſhing in the ſpring, and they have generally had ſome idle days in the winter; their fodder, however, in this caſe, has been proportionable.

In the Rural Economy of Yorkſhire, the long agitated diſpute about the ſuperiority of oxen or horſes, as beaſts of draught, may be conſidered with ſingular propriety. But he is afraid even this county will not furniſh us ſufficient evidence for final deciſion.

"Formerly, and from time immemorial, four or ſix oxen in yokes, led by two horſes, alſo double, were the invariable draught or team of the country; not only upon the road, but in ploughing. Even in ſtirring a fallow, four oxen and two horſes were generally conſidered as requiſite. And in breaking up a fallow, two men and a boy were the common attendants of this unweildy, expenſive team.

"At preſent, there is not perhaps, throughout the vale, a ſingle ox employed in tillage: two horſes with whip reins, without a driver, is now the univerſal plough-team for all ſoils, in almoſt every ſtate.

"Upon the road, however, that is to ſay, in farm carriages, oxen are ſtill in uſe; but ſeldom more than a ſingle pair to a carriage; generally at the pole, with two or three horſes at length before them. Beſide, a number of entire horſe-teams now travel upon the road; things which were formerly unknown in the country.

"Even the timber-carriers (an induſtrious wary ſet of men) continue to uſe them; though their ſole employment be upon the road. They not only find them able to ſtand working every day, provided their feet do not fail them: but, what is much in their favour, they are found to ſtand long hours better than horſes going in the ſame paſture. An ox in a good paſture ſoon fills his belly, and lays himſelf down to reſt; whereas a ſhort ſummer's night ſcarcely affords a horſe time enough to ſatisfy his hunger.

"Another advantage of oxen is here held out. In ſtiff pulls of every kind, moſt eſpecially in going up ſteep hills, a pair of oxen is conſidered as a ſheet anchor. Horſes, it is agreed, are fearful, and ſoon loſe their feet in a ſteep ſlippery road; while oxen, where they are unable to proceed, will always ſtand their ground. Indeed, oxen ſeem to be conſidered as eſſentially neceſſary in an aukward hilly country.

"If we had no other ſpecies of animals adapted to the purpoſe of draught in the iſland, nor any one which could be naturalized to the climate, cart-horſes would be truly valuable; they being much ſuperior to the breed of ſaddle-horſes for the purpoſes of draught.

"But it appears to him evident, from the experience he has had, and the obſervations he has made, that were only a ſmall ſhare of the attention paid to the breeding of draught oxen, which now is beſtowed on the breeding of cart-horſes; animals equally powerful, more active; leſs coſtly; equally adapted to the purpoſes of huſbandry (if harneſſed with equal judgment); leſs expenſive in keep and attendance; much more durable; and infinitely more valuable after they have finiſhed their labours; might be produced."

An ox is to draw the plough only from his third to his tenth year, when it will be adviſable to fatten and ſell him, as being then of a better fleſh than if he was kept longer. The age of this creature is known by his teeth and horns. The firſt fore-teeth, which he ſheds at the end of ten months, are replaced by others, larger, but not ſo white; at ſix months the teeth next to thoſe in the middle fall out, and are alſo replaced by others; and in three years all the inciſive teeth are renewed. They are then equal, long, and pretty white; but as the ox advances in years, they wear, become unequal, and black. It is the ſame in the bull and cow: ſo that the growth and ſhedding of the teeth are not affected by caſtration, or the difference of ſexes. Nor is the ſhedding of horns affected by either; as both bull, ox, and cow, loſe them alike at the end of three years; and theſe alſo are replaced by other horns, which, like the ſecond teeth, remain; only thoſe of the ox and cow are larger and longer than thoſe of the bull. The manner of the growth of theſe ſecond horns is not uniform, nor the ſhooting of them equal. The firſt year, that is the fourth of the ox's age, two ſmall pointed horns make their appearance nearly formed, ſmooth, and towards the head terminated by a kind of button. The following year, this button moves from the head, being impelled by a corneous cylinder, which alſo lengthening, is terminated by another button; and ſo on; for the horns continue growing as long as the creature lives. Theſe buttons become annular joints, which are eaſily diſtinguiſhed in the horn, and by which the age of the creature may be readily known; counting three years for the point of the horn to the firſt joint, and one year for each of the other intervals. See AGE *of Neat Cattle*.

The writer of a late treatiſe on cattle ſuggeſts, that "as a labouring animal, for agricultural purpoſes, he is, on the whole, far ſuperior to the horſe. This important poſition has been ſo repeatedly and irrefragably proved, that it ought, at this period, to be fully ſufficient to make the aſſertion to be no otherwiſe diſproved than by a fair adduction of equivalent and contrary facts. If we can produce, in the ox, ſtrength and weight enough for the heavieſt, with ſpeed ſufficient for the lighteſt ſoils, and thoſe joined with the higheſt degree of docility and reſolution, what would the huſbandman more? Let him, under theſe circumſtances, make his calculation between the value of thoſe benefits to be derived from the labour of the horſe and the ox, taking into the account the leſs expenſive keep of the latter, even when corn-fed, and that the profits of breeding and training for ſale the labouring ox would probably equal the ſimilar tranſactions with the horſe." It is added that the blundering abſurdities publiſhed by theoretical advocates for ox-labour have ſerved to miſlead many, and to bring infinite prejudice to the cauſe. We have been gravely inſtructed, that the ox is fitted for the labours of tillage, 'by the unwieldy magnitude of his body, the ſlowneſs of his paces, and the ſhortneſs of his legs!' the very qualities which render him ſo totally unfit for the purpoſe, any otherwiſe than as a wretched ſubſtitute, and which affords the horſe ſo manifeſt a ſuperiority over him. Oxen of this deſcription could only be advantageous for the labours of the field, in times anterior to the great improvements of horſes, and the preſent character of the Britiſh labouring ox, is a direct reverſe of the picture." And we may even go farther, and aſſert, without the ſmalleſt impropriety, that we poſſeſs breeds of neat cattle in this country, well qualified,

from

from their conſiderable powers of progreſſion, for the ordinary purpoſes of quick draught, carrying of burdens, or even for the ſaddle. Such are the Devons, Glamorgans, and the lighteſt of the Suſſex cattle. It is not improbable, that ſome of theſe are able to trot ſeven or eight miles within the hour. Three or four years ſince, a Suſſex ox ran four miles over Lewis courſe, for a hundred guineas, which he performed after the rate of fifteen miles *per* hour Cuſtom alone renders the uſe of bullocks for the ſaddle and the coach unapproved and unnoticed, or ſtrange and ridiculous. Over great part of Aſia, immemorial uſage has eſtabliſhed the propriety of employing oxen in both theſe capacities. They have, it is true, in thoſe countries, the biſon and the zebu, a ſpecies of oxen ſuperior to our's in activity and facility of progreſſion, but the compariſon only proves theſe inferior, by no means uſeleſs, even for quick draught. Were it really an object with us to make uſe of bullocks in this way, there can be no doubt of its ſucceſs, if aided by an increaſed attention to their breed and training, and a due meaſure of that liberal treatment which they are accuſtomed to receive in India, where their travelling oxen are curried, clothed, and attended with as much ſolicitude, and much greater kindneſs, than we beſtow on our beſt horſes. The Indian cattle are extremely docile and quick of perception, patient and kind; like the horſe, their chief travelling pace is the trot, and they are reported by thoſe who have ridden them, often to perform journies of ſixty ſucceſſive days, at the rate of thirty to forty-five miles *per* day. It ought not to be forgotten in favour of the ox, that, like the generous horſe, he is honeſt to the laſt, and never ſtops, or ſhews muleiſh or aſinine reſtleſsneſs and diſobedience."

It is likewiſe ſtated that "much is ſaid in favour of the mule and the aſs, on account of the duration of their labour to ſo late a period, and a ſuperiority thence challenged for the mule, even over the horſe; but with the ox age ſeems to form no queſtion, he may, with the utmoſt truth, be ſaid never to grow old, ſince his laſt value is ſuperior to his firſt, and ſince the keeping of his ſucceſſor is, in every view, a benefit to a man, being an animal which exhauſts not like the horſe, but manures and improves the land on which he is fed and ſupported."

The largeſt oxen are to be choſen for work and for feeding, but then it muſt be where there is land rich enough to maintain them. When they are to draw, care muſt be taken to match them well, both for height and ſtrength; for if one be ſtronger than the other, the weakeſt will ſoon be deſtroyed. They muſt never be driven beyond their natural pace, for the beating of them throws them into ſurfeits, and many other diſeaſes. The time of putting oxen to work is at three years old; they muſt be worked gently the firſt year, eſpecially in hot weather, and fed with a large quantity of hay: this will enable them to bear their labour better than graſs; and they ſhould always be kept in a middle ſtate, neither too fat nor too lean. They may be worked till they are ten or twelve years old, and then ſold.

It is obſerved, that meat and fair treatment ſucceed much better with this animal than blows. The beſt way to break a young one to the yoke is to put him to it with an old tame ox of about his own height and ſtrength. If he prove unruly after this, he muſt be kept hungry, and made to feed out of the driver's hand. Oxen are much more profitable to keep than horſes, there being no loſs in them: and an old wrought ox fattening as well as a young one, and being as good meat. Their keeping alſo is cheaper, for they eat no oats: their harneſs and their ſhoes alſo are conſiderably cheaper, and they are not ſo ſubject to diſeaſes. They muſt always indeed have good graſs and good hay, and they are not ſo ſerviceable as horſes, when there is much working in carts, and where the ways are good; but for winter ploughing, where the ground is heavy, an ox will do as much work as a horſe.

Every farmer, who can keep two teams, would do wiſely to have one of them of horſes, and the other of oxen; it is much better to yoke them together by the necks and breaſts, than by the horns, as ſome do; and where a man keeps an ox-team, he ſhould raiſe two oxen and two cow calves every year, to keep up his ſtock; for it is better for a farmer, in all neceſſary things, to be a ſeller than a buyer. Chalky lands ſpoil the feet of oxen more than any other. See TEAM.

*Stealing* oxen, or creatures of the ox kind, old or young, whether bull, cow, &c. ſtrictly ſo called, ſteer, bullock, heifer, or calf, is now felony without benefit of clergy; as is likewiſe killing any of theſe, with an intent to ſteal any part of their carcaſes. Stat. 15 & 16 Geo. II. cap. 34 and ſtat. 14 Geo. II cap. 6. See CATTLE.

OX-*Bird*, in *Ornithology*. See TANTALUS *Ibis*.

OX-*Eye*. See CENTHA.

OX-*Eye*. See FRINGILLAGO.

OX-*Eye*, in *Botany*. See BUPHTHALMUM.

OX-*Eye Daiſy*. See CHRYSANTHEMUM.

OX-*Eye*, in *Sea Language*, a name given by the ſeamen to thoſe dreadful ſtorms that are ſometimes met with on the coaſt of Guinea; for at firſt it appears in the form of an ox's eye, and not much bigger; but it deſcends with ſuch celerity, that in a very little ſpace of time, and often before they can prepare themſelves for it, it ſeems to them to overſpread the whole hemiſphere; and at the ſame time forces the air with ſo much violence, that the ſhips are ſometimes ſcattered ſeveral ways, ſome directly contrary, and ſometimes are ſunk downright.

OX-*Eye*, in *Optics*. See SCIOPTIC and CAMERA *Obſcura*.

OX-*Fly*, in *Natural Hiſtory*, a ſpecies of two-winged fly, bred from a fly-worm, hatched under the ſkin of oxen, from the egg of the parent fly lodged there.

The female of this fly makes a number of ſmall wounds in the backs of the horned cattle, and in each of theſe depoſits an egg: which is afterwards hatched by the warmth of the creature's body. As ſoon as hatched, the young worm finds itſelf in a very convenient lodging, and in a way to be furniſhed with all the neceſſaries of life.

The places where they lie are eaſily diſcovered, as there is ever a tumour about them, like that on the foreheads of children from falls; within this, and under the thick ſkin of the creature, is the worm lodged. The country-people know very well that a worm is contained within each of theſe tumours, but they are ſomewhat miſtaken as to the fly it comes from; the gad-fly being the moſt buſy about theſe creatures, and giving them moſt vexation, they naturally enough have ſuppoſed this the produce of the egg of that fly; but this is an erroneous opinion: Mr. Valiſnieri ſeems the firſt who underſtood the true ſtate of the caſe, and he has given a very full and excellent account of it. See BOTTS and OESTRUS.

OX-*Lips*, in *Botany*. See PRIMULA.

OX *Mountain*, in *Geography*. a mountain of Ireland, in the county of Sligo, ten miles W.S.W. of Sligo.

OX-*Tongue*, in *Botany*. See PICRIS.

OXALATS, in *Chemiſtry*, are combinations of the oxalic acid with the baſes of ſalts. See the baſes reſpectively.

OXALIC ACID, a vegetable acid, naturally formed in the oxalis acetoſella, or wood ſorrel, from which it takes its name.

It

It has been diſcovered by Scheele, that this acid can be formed by the action of nitric acid upon ſugar, and ſeveral other vegetable ſubſtances. The merit of this diſcovery was formerly given to Bergman, who firſt publiſhed the method of preparing it.

In order to form this acid with ſugar and nitric acid, let one part of the former be put into a glaſs retort with three parts of the acid of the ſpecific gravity 1.5, and a gentle heat applied: in a ſhort time a briſk effervеſcence enſues, cauſed by the rapid eſcape of nitrous gas and carbonic acid. This proceſs is to be continued till the effervеſcence ceaſes, and the red fumes diſappear; three parts more of nitric acid are then to be added, when a freſh but leſs violent action will take place, this being continued till the fumes ceaſe, and the liquid becomes colourleſs. It may now be left to cool, when cryſtals of oxalic acid will be depoſited. If the remaining liquor be again treated with nitric acid, it will be rendered capable of affording more cryſtals. When the cryſtals are ſeparated, they ſhould be diſſolved in diſtilled water, and cryſtallized a ſecond time, and in ſome caſes a third cryſtallization may be neceſſary. When they are of a pearly white colour, they may be deemed pure oxalic acid. At firſt view the cryſtals appear like a maſs of needles, but upon cloſe examination they will be found to be four-ſided priſms. They are exceedingly ſharp and acrid to the taſte. They diſſolve in their own weight of boiling water, and in twice their weight of water, at 60°. The ſolution, when ſufficiently diluted, has an agreeably acid taſte. One part of boiling alcohol diſſolves .56 of oxalic acid. It changes vegetable blues to red, and one part gives a ſenſible acidity to .2633 of water. The cryſtallized acid, according to Dr. Thomſon, conſiſts of 77. real acid and 23 water. The cryſtals are not changed by expoſure to the air. When expoſed to heat it gives out diſagreeable pungent fumes of a white colour. It would appear that in this change the water of cryſtallization eſcapes, carrying off a portion of the acid, for the reſiduum is whiter than the cryſtals, and the water is reabſorbed from the atmoſphere, giving it its original properties. When expoſed to diſtillation it firſt undergoes the change above-mentioned. A portion of the acid is ſublimed without alteration. The remainder is decompoſed, affording a dark coloured reſiduum, carbonic acid, carburetted hydrogen, and probably carbonic oxyd.

It oxydates moſt of the metals, as gold, platina, ſilver. Mercury and ſeveral others are exceptions.

It combines with the alkalies, earths, and metallic oxyds, forming ſalts called oxalats.

Although the acid has been formed in the preſence of nitric acid, yet when it is heated with freſh ſtrong acid, mutual decompoſition takes place, and the oxalic acid is converted into carbonic acid and water.

The ſulphuric acid partly decompoſes it when heat is applied, but the change appears to be ſimilar to that produced by heat alone.

The muriatic acid diſſolves it without changing its properties.

The conſtituents of this acid, as well as the reſt of the vegetable acids, have not as yet been determined with preciſion.

An analyſis, given by Fourcroy and Vauquelin, determines it as follows:

| | |
|---|---|
| Oxygen | 77 |
| Carbon | 13 |
| Hydrogen | 10 |
| | 100 |

A more recent analyſis, by Dr. Thomſon, ſtates it to conſiſt of

| | |
|---|---|
| Oxygen | 64 |
| Carbon | 32 |
| Hydrogen | 4 |
| | 100 |

This laſt is nearer the truth. We have, however, a ſtill later analyſis by Gay Luſſac and Thenard, by a new mode of operating, with hyper-oxymuriat of potaſh. The proportions determined by theſe laſt chemiſts are,

| | |
|---|---|
| Oxygen | 70.69 |
| Carbon | 26.59 |
| Hydrogen | 2.72 |
| | 100. |

In theſe experiments, upon analyſis, it will be more certain to operate upon ſome of the oxalats, rather than upon the free acid, except its water of cryſtallization could be accurately determined. Another objection is its ſubliming before it is decompoſed, which is not the caſe when the acid is combined. The oxalat of lime has been employed for this purpoſe. The oxalats of lead, mercury, and perhaps ſilver, might be employed to advantage when they are well defined.

This, like all other chemical compounds, muſt be conſtituted by limited proportions of its elements, which are oxygen, hydrogen, and carbon. It appears, from the proportion in which it combines with the different ſaline baſes, to have the lighteſt atom of any of the vegetable acids. If we call hydrogen 1, its atom is about 20.

The atom of ſugar, according to a late analyſis by Gay Luſſac and Thenard, is 50 oxygen, 42 carbon, and 6.96 hydrogen. This nearly agrees with one atom of each. We have ſeen that oxalic acid is formed by the mutual decompoſition of ſugar and nitric acid. Although in this decompoſition carbonic acid is evolved, it does not appear that its evolution is eſſential to the formation of oxalats. If the proceſs could be ſo conducted that an atom of oxygen might be transferred from an atom of nitric acid to an atom of ſugar, it would form an atom of oxalic acid, while an atom of nitrous gas eſcapes. The atom of oxalic acid may, therefore, be regarded as conſtituted by an atom of ſugar and an atom of oxygen; the firſt being 5.4 of carbon, 7 of oxygen, and 1 hydrogen. This, added to an atom of oxygen from the acid, will be $5.4 + 2 \times 7 + 1 = 20.4$ the atom of oxalic acid. From theſe data its proportions *per cent.* will be

| | |
|---|---|
| Oxygen | 68.6 |
| Carbon | 26.5 |
| Hydrogen | 4.9 |
| | 100. |

This agrees remarkably with the laſt analyſis by the French chemiſts.

From the numbers which may be given to the citric and tartaric acids in their ſaline combinations, the former being about 34, and the latter 45, we may preſume the citric acid to be formed by 2 atoms of ſugar and 1 of oxygen, which will give $(7 + 5.4 + 1) \times 2 + 7 = 33.8$. The tartaric acid appears to conſiſt of 3 atoms of ſugar with 1 of oxygen, or $(7 + 5.4 + 1) \times 7 = 47.2$.

The oxalic acid is principally uſed as a chemical agent.

From the very inſoluble compound which it forms with lime, it is a valuable teſt of the latter ſubſtance. It muſt, however, be obſerved, that the ſuper-oxalat of lime is ſoluble, hence the acid ſhould not be uſed in exceſs. The proper way is to uſe the oxalat of ammonia

It has the property of diſſolving the red oxyd of iron in common with the citric and tartaric acids, but in a greater degree. If it could be made cheap, it would be a valuable acquiſition to the calico printers.

OXALIS, in *Botany*, from ὀξυς, *four*, a name adopted from the Greeks; whoſe ὀξαλις, however, is probably the *Acetoſa* of the Latins, and belongs to the genus *Rumex;* the genus of which we are to treat being ſcarcely diſcoverable in the writings of the ancients, and the firſt of its ſpecies which drew the attention of the earlier modern botaniſts, having been called in their works by various names of their own invention, not worth ſcrutinizing. Poſſibly this may be the *Oxys* of Pliny, which he ſays bore ternate leaves, and was given to perſons with weak ſtomachs.—Linn. Gen. 231. Schreb. 311. Willd. Sp. Pl. v. 2. 772. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 491. Ait. Hort. Kew. ed. 2. v. 3. 116. Juſſ. 270. Lamarck Illuſtr. t. 391. Gærtn. t. 113. (Oxys; Tourn. t. 19.)—Claſs and order, *Decandria Pentagynia.* Nat. Ord. *Gerania*, Juſſ. Rather perhaps allied to his *Rutaceæ.*

Gen. Ch. *Cal.* Perianth of five, rather ſhort, permanent leaves. *Cor.* Petals five, obovate, obtuſe, emarginate, ſpreading; their claws erect, and often cohering. *Stam.* Filaments ten, erect, awl-ſhaped, the five alternate ones ſhorteſt, all frequently combined at the bottom, the longeſt ſometimes furniſhed with a prominent tooth; anthers verſatile, elliptical, two-lobed, furrowed. *Piſt.* Germen ſuperior, with five angles; ſtyles five, thread-ſhaped, various in length with regard to the ſtamens; ſtigmas obtuſe. *Peric.* Capſule membranous, with five angles, five cells, and five valves, burſting longitudinally at the angles. *Seeds* one or more in each cell, roundiſh, ſlightly compreſſed, poliſhed, widely diſperſed, by means of a bivalve elaſtic tunic.

Eſſ. Ch. Calyx of five leaves. Petals five, connected by their claws. Stamens unequal, partially combined at the baſe. Capſule ſuperior, of five cells, burſting at the five angles. Seeds with an elaſtic tunic of two valves.

This curious and pretty genus, of which only 13 ſpecies are found in the firſt edition of the *Species Plantarum*, is augmented to twice that number in *Syſt. Veg.* ed. 14. The diſcoveries of recent botaniſts, at the Cape of Good Hope, have added a much greater number to the original ſtock. Jacquin, in a valuable quarto monograph on the genus, deſcribes 96. Willdenow reduces them to 93, and of theſe 58 are, or have been, cultivated in the Royal Gardens at Kew. Two are natives of Britain; 13 of America; one of the Eaſt Indies; the reſt of the Cape of Good Hope. Nearly all the latter perhaps have bulbous roots, and grow in ſandy ground, flowering after the rainy ſeaſon, their economy being like that of the Cape bulbs, properly ſo called, which belong to the natural order of Ensatæ. (See that article.) In England they may be preſerved in the greenhouſe, and will bloſſom either very late in autumn, or early in the ſpring. After flowering, the pots require to be kept without water till Auguſt, about which time the roots will put forth freſh leaves. The Cape ſpecies ſcarcely ever produce ſeeds in Europe, nor do they indeed all readily flower, without a great degree of heat, though moſt of them ſucceed by being placed in a glaſs frame, after they have put forth leaves in pots in the open air. The ſpecies are arranged by their leaves, which in moſt are ternate. *O. ſenſitiva* alone, the Eaſt Indian one, has pinnate foliage. Three have ſimple, four twin, and ſix digitate leaves A few examples will illuſtrate each of the ſections, which are nine in all.

Sect. 1. *With ſimple Leaves.*

O. *monophylla.* Simple-leaved Wood Sorrel. Linn. Mant. 241. Thunb. Oxal. 8. t. 1. f. 1. Jacq. Oxal. 56. t. 79. f. 3. Willd. n. 1. Ait. n. 1.—Stem none. Stalks ſingle-flowered. Leaves elliptical, obtuſe. Filaments ſmooth.—Native of ſandy hills at the Cape. Sent by Mr. Maſſon to Kew in 1774, where it is ſaid to have flowered in October and November. The *bulb* is ovate, about as big as a hazel-nut, with a very fibrous coat. *Leaves* four or five, ſcarcely an inch long, entire, finely downy at the edges only, on ſtalks about the ſame length. *Flower-ſtalks* taller than the leaves, round, downy. *Calyx* downy. *Corolla* pale purple, an inch long, with yellow claws. *Stamens* much ſhorter than the corolla, all ſmooth; five of them very ſhort, the reſt riſing much above the *ſtyles*, which are clothed at the top only with glandular hairs. *Stigmas* obtuſe, downy.

O. *lepida.* Jacq. t. 21, and *roſtrata*, t. 22, ſeem to us too nearly related to the above. There is in fact not the leaſt difference between any of them, except in the *ſtamens* and *ſtyles.* In *lepida* five of the *ſtamens* are extremely ſhort, and the reſt but half the length of the *ſtyles*, which in this ſpecies are remarkably long, ſtraight, and perfect, covered, like the longer ſtamens, with glandular hairs; their *ſtigmas* large and bearded. In *roſtrata* the *ſtyles* are extremely ſhort, ſmooth, and turned out horizontally between the *ſtamens;* the five ſhorteſt of which riſe far above them, and the five longeſt, which are hairy, more than twice as far, ending in a very peculiar glandular tip above each *anther.* This appendage is analogous to what is ſeen in the New Holland genus *Boronia*, and has been cited, by the writer of the preſent article, as one indication, amongſt others, of the affinity between theſe two genera, which their mutual acidity countenances. In the preſent caſe he hazards another conjecture, that the two ſpecies of *Oxalis* in queſtion may be ſexual varieties; in one of which, effectually male, *roſtrata*, the *ſtamens* are moſt perfect; in the other, *lepida*, the *piſtils.* Experience only can ſettle this curious queſtion, which appears not to have entered into the mind of their cultivator and deſcriber, Jacquin. *O. monophylla* ſeems to be the natural or ordinary ſtate of the ſame plant, in which the *ſtamens* and *ſtyles* bear that due proportion to each other, obſervable in other ſpecies.

Sect. 2. *With twin Leaves.*

O. *aſinina.* Aſſes-eared Wood Sorrel. Jacq. t. 24. Willd. n. 4. Ait. n. 3.—Stem none. Stalks ſingle-flowered. Leaflets elliptic-lanceolate. Five of the ſtamens glandular, and taller than the ſtyles.—From the Cape. The *leaves* are numerous, each pair on a winged obovate foot-ſtalk; *leaflets* glaucous, two inches or more in length, with white, crenate, cartilaginous edges. *Flowers* yellow, on ſtalks rather taller than the foliage. Five of the *ſtamens* very ſhort and ſmooth; the reſt glandular, with a ſmooth projection at their baſe, and riſing to nearly twice the height of the *ſtyles*, which ſeems to be their moſt proper and uſual proportion in this genus.

We cannot but make the ſame remark as in the former ſection, reſpecting *lanceæfolia*, (an ill-conſtructed name), Jacq. t. 26; which though ſubject to have ſome ternate *leaves*, ſcarcely differs otherwiſe from the *aſinina*, except in having the *ſtamens* all ſmooth, without a projection at the baſe, and nearly of equal length, ſeemingly feeble and imperfect, while the vigorous *ſtyles* riſe much above them, and,

and, if we miſtake not, indicate this to be the female plant, the former the male.

O. *criſpa*, t. 23, and *leporina*, t. 25, two whitiſh-flowered ſpecies of this ſection, in both which the *ſtyles* ſurmount all the *ſtamens*, may probably be diſtinct, as differing conſiderably in their *leaves*, though otherwiſe nearly related to each other.

Sect. 3. *With ternate Leaves, and a ſingle-flowered Stalk.* Here Willdenow has thirty-two Species.

O. *fabæfolia*. Bean-leaved Wood Sorrel. Jacq. t. 27. Willd. n. 8. Ait. n. 7.—Stem none. Stalk ſingle-flowered. Leaflets obovate, emarginate, on winged foot-ſtalks.—Nearly allied to *aſinina*, though unqueſtionably a very diſtinct ſpecies. The *leaflets* are ternate, broad, obovate and emarginate, quite entire, without any cartilaginous edge. Wings of the *footſtalks* alſo very broad. *Flowers* yellow, very pale at the back. *Stamens* all glandular and rather ſhort, with five prominent teeth at the baſe. *Styles* of an intermediate length between the longer and ſhorter ſtamens.

O. *ſanguinea*. Bloody-leaved Wood Sorrel. Jacq. t. 29. Willd. n. 10. Ait. n. 9.—Stem none. Stalks ſingle-flowered. Leaflets oblong, obtuſe, downy; the lateral ones dilated, the middle one contracted, at the baſe. Styles and longer ſtamens hairy.—With this we would unite *laburnifolia*, Jacq. t. 28, as differing chiefly in having the *ſtyles* longer than any of the *ſtamens*, whereas in t. 29 they are intermediate between the longer and ſhorter. The herbage of both is downy. *Footſtalks* and backs of the *leaves* deep red. *Petals* yellow, externally downy. There are a few glandular hairs, beſides the ſimple ones, on the *calyx* of *laburnifolia*, and the teeth of its longer *ſtamens* are rather ſhorter and thicker than in the other, which, all things conſidered, only ſhews thoſe characters to be variable.

O. *Acetoſella*. Common Wood Sorrel. Linn. Sp. Pl. 620. Sm. Fl. Brit. n. 1. Engl. Bot. t. 762. Curt. Lond. faſc. 2. t. 31. Woodv. Med. Bot. t. 20. Fl. Dan. t. 980. Willd. n. 25. Ait. n. 18. Jacq. t. 80. f. 1. (Oxys alba; Ger. em. 1201.)—Stem none. Stalks ſingle-flowered. Leaflets inverſely heart-ſhaped, hairy. Styles and ſtamens ſmooth. Root of ſcaly joints.—Native of ſhady groves in moſt parts of Europe; frequent with us in the ſpring. The *root* is remarkable for being jointed, or compoſed of ſmall cluſters of fleſhy ſcales, connected by a thread-like ſtalk. *Leaves* on long, weak, hairy, wavy ſtalks; their *leaflets* drooping, folded, purple at the back. *Flower-ſtalks* taller than the leaves, each bearing a delicate drooping inodorous *flower*, whoſe white or bluſh-coloured *petals* are veined with purple. The longer *ſtamens* are equal to the *ſtyles*, and all are ſmooth. The *capſules* dart forth their *ſeeds* at the ſlighteſt touch, by means of their elaſtic *arillus*, or tunic. Some old authors have named this plant *Lujula*, which the Italians are ſaid to have metamorphoſed into *Alleluia*; and then, to account for this novel appellation, they ſuppoſed it aroſe from the flowers appearing at the ſeaſon when *Alleluia* was ſung in their churches! The *leaves* poſſeſs an agreeable acidity, mixed with aſtringency, and their conſerve, made with fine ſugar, has the flavour of green tea. Its qualities are cooling and refreſhing, but the abundance of common fruits which have the ſame properties, has ſuperſeded the medicinal uſe of this very grateful preparation.

O. *marginata*. Bordered Wood Sorrel. Jacq. t. 68. Willd. n. 27.—Stem none. Flower-ſtalk ſingle-flowered, but half the length of the footſtalks. Leaflets ſquariſh, emarginate. Calyx fringed. Stamens without teeth.—The *root* is bulbous, with a ſmooth coat. *Leaves* dark green, downy, broad and ſhort, on red ſtalks, forming a denſe tuft. *Flowers* white with ſtreaked claws, large, on ſhort declining ſtalks. The *ſtyles* in this are of intermediate length between the *ſtamens*. In *pulchella*, Jacq. t. 69. Willd. n. 28. Ait. n. 19, they riſe much above all the *ſtamens*. This latter therefore we cannot but conſider as a mere female variety, there being nothing that indicates a ſpecific difference, but rather a peculiar conformity, in the reſt of the plant.

Sect. 4. *With ternate Leaves, and a many-flowered Stalk.* Nine Species in Willdenow.

O. *megalorrhiza*. Great-rooted Wood Sorrel. Jacq. Oxal. 33. Willd. n. 42. (Oxys luteo flore, radice craſſiſſimâ; Feuill. Peruv. v. 2. 734. t. 25.)—Stem none. Stalk umbellate. Leaflets inverſely heart-ſhaped. Root very thick, much branched at the ſummit.—Native of the mountains of Peru. It is known only from the figure and deſcription in Feuillée, but the very large, branched, fleſhy *root*, running deep into the earth, and dividing into many thick heads at the ſummit, is altogether peculiar in this genus. The *ſtalks* of the *leaves* and thoſe of the *flowers* are each about three inches high. The *petals* are yellow, with red veins.

O. *tetraphylla*. Four-leaved Wood Sorrel. Cavan. Ic. v. 3. 19. t. 237. Willd. n. 43, ſeems a moſt trifling variety of the following, which happens to have ſometimes four *leaflets* on a ſtalk. Cavanilles ſaw it in the garden at Madrid, to which it was ſent from Mexico.

O. *violacea*. Violet American Wood Sorrel. Linn. Sp. Pl. 621. Jacq. Hort. Vind. v. 2. 84. t. 180. Oxal. t. 80. f. 2. Willd. n. 44. Ait. n. 24.—Stem none. Stalk umbellate, many-flowered. Flowers drooping. Leaves inverſely heart-ſhaped, fringed.—Native of Virginia and Canada. Mr. Aiton, like Jacquin, marks it as a greenhouſe plant, flowering in May and June. The *roots* are bulbous, aggregate, with interſperſed ſcales. *Leaves* numerous, fringed, broadly obcordate, on ſtalks about a ſpan high. *Flower-ſtalks* rather taller, umbellate, ſometimes, but not conſtantly, forked, with a ſolitary intermediate *flower*. The *bloſſoms* are at firſt drooping, then erect, with delicate, recurved, ſtriated, light purple *petals*. Tips of the *calyx-leaves* ſometimes abrupt and glandular.

Sect. 5. *With ternate Leaves, ſingle-flowered Stalks, and a Stem naked below.* Fifteen Species.

O. *ciliaris*. Fringe-leaved Wood Sorrel. Jacq. t. 30. Willd. n. 49. Ait. n. 29.—Stem erect, ſimple. Leaves cluſtered at its top. Leaflets elliptic-oblong, emarginate, hairy. Bracteas linear, cloſe to the flower.—From the Cape. Sent by Mr. Maſſon in 1793. The *root* is a ſmooth *bulb*. *Stem* three or four inches high, almoſt leafleſs, except at the top, where is a cluſter of numerous, glaucous, downy, ternate *leaves*, of a nearly elliptical form, with a notch at the end. *Flowers* red, on ſimple *ſtalks* taller than the *leaves*, with a pair of oblong linear *bracteas* cloſe to the *calyx*. The *ſtyles* riſe above all the *ſtamens*, and like them are hairy.

O. *arcuata*. Glandular Wood Sorrel. Jacq. t. 31. Willd. n. 50. Ait. n. 30.—Stem decumbent, ſimple, naked below.—Leaves cluſtered at its top. Leaflets linear, emarginate, hairy. Bracteas linear, cloſe to the flower.—Nearly allied to the laſt, but probably a diſtinct ſpecies. We cannot but conſider it however as the male plant of *O. linearis*, Jacq. t. 32, for the ſame reaſons that have led to our preceding opinions. The *ſtyles* are very ſhort in *arcuata*, very long in *linearis*.

O. *natans*. Floating Wood Sorrel. Linn. Suppl. 243.

Willd. n. 58. Ait. n. 35. Thunb. Oxal. 9. t. 1. f. 4. Jacq. t. 76. f. 2.—Stem floating, naked below. Leaves cluſtered at its top. Leaflets inverſely heart-ſhaped, ſmooth. Calyx ſmooth.—Native of pools and ditches at the Cape; the ſlender *ſtem* varying in length according to the depth of the water, the tufts of *leaves* floating on the ſurface. *Flowers* erect, white, yellowiſh at the baſe, on ſimple ſtalks, ſcarcely ſo long as the *leaves*. The *footſtalks* in our ſpecimens are hairy, eſpecially their ſummits cloſe to the *leaflets*.

O. *verſicolor*. Striped-flowered Wood Sorrel. Linn. Sp. Pl. 622. Willd. n. 6. Ait. n. 37. Sm. Ic. Pict. t. 7. Curt. Mag. t. 155. Jacq. t. 36. and t. 77. f. 4.—Stem weak, naked below. Leaves cluſtered about its top. Leaflets linear, emarginate, with two callous points beneath.—An elegant ſpecies, conſpicuous for the crimſon margins of the white *petals*, which give the buds a ſpirally ſtriped appearance.

Sect. 6. *With ternate Leaves, ſingle-flowered Stalks, and a leafy Stem.* Twelve Species.

O. *tubiflora*. Tube-flowered Wood Sorrel. Jacq. t. 10. Willd. n. 67. Ait. n. 44.—Stem erect, ſomewhat branched, leafy, hairy. Leaves nearly ſeſſile, alternate. Leaflets linear-wedge-ſhaped, recurved. Tube of the flower much longer than its border.—The *ſtem* is about a foot high, round, hairy, beſet with numerous, ſcattered, ſmall, nearly ſeſſile, hairy, narrow, ternate *leaves*. *Flower-ſtalks* axillary, ſolitary, many times longer than the leaves. *Flowers* crimſon; their claws united into a cylindrical downy tube, conſiderably above an inch long, and nearly twice the length of the limb. Willdenow unites with this Jacquin's *caneſcens*, t. 11, whoſe *flower* is of rather a more blueiſh purple. In both the *ſtyles* are ſhorter than any of the *ſtamens*, and we venture to eſteem them male plants, *macroſtylis* of the ſame author, t. 9, in which the *ſtyles* riſe above all the *ſtamens*, being the female. Theſe two plants are ſo exactly the ſame, that nothing but a determination to aſſume an arbitrary character, and to carry it through in ſpite of nature, could induce any perſon to ſeparate them. *O. ſecunda*, t. 12, is probably another variety.

Dr. Sims in Curt. Mag. under *O. rubella*, t. 1031. Jacq. t. 16. Willd. n. 70. Ait. n. 47, has remarked that *hirta*, t. 13, and *roſacea*, t. 17, of Jacquin, are very nearly allied to that ſpecies. We cannot but agree to this, and if we were writing a complete hiſtory of the genus, we might perhaps reduce ſome other ſuppoſed ſpecies to the ſame. *O. hirta*, by its long *ſtyles*, ſeems a female variety.

Sect. 7. *With ternate Leaves, many-flowered Stalks, and a Stem.* Sixteen Species.

O. *ſtricta*. Yellow Upright Wood Sorrel. Linn. Sp. Pl. 624. Willd. n. 80. Ait. n. 52. Jacq. t. 4.—(O. corniculata; Fl. Dan. t. 873. O. ambigua; Saliſ. Tr. of Linn. Soc. v. 2. 242. t. 23. f. 4.)—Root creeping. Stem erect, branched. Leaflets inverſely heart-ſhaped. Umbels ſtalked, axillary, ſolitary, many-flowered.—Native of North America, now naturalized as a weed in many Engliſh gardens. *Roots* widely creeping, perennial. *Stems* a foot high, or more, quite erect, ſlightly branched, leafy, round, reddiſh, ſucculent, ſmooth or downy. *Leaves* numerous, ſcattered, on long ſtalks. *Umbels* ſolitary, on long, axillary, ſolitary ſtalks, about equal to the *footſtalks*, but ſtraighter. *Flowers* numerous, ſmall, yellow. *Styles* about as long as the longer *ſtamens*, hairy.—The name of *ſtricta* well diſtinguiſhes this from the following, for which ſome have miſtaken it.

O. *corniculata*. Yellow Procumbent Wood Sorrel. Linn. Sp. Pl. 623. Willd. n. 81. Ait. n. 53. Jacq. t. 5 Engl. Bot. t. 1726. (O. puſilla; Saliſ. Tr. of Linn. Soc. v. 2. 243. t. 23. f. 5. O. lutea; Ger em. 1202.)—Stem branched, creeping, diffuſe. Leaflets inverſely heart-ſhaped. Umbels ſtalked, axillary, ſolitary, of few flowers.—Native of various parts of Europe. Found abundantly naturalized, if not wild ſtate, in Devonſhire and other ſouthern parts of England, flowering from May to October. The long, trailing, creeping *ſtems*, and the fewer *flowers* in each *umbel*, diſtinguiſh it from the laſt. The name of *corniculatum* has remained with this, becauſe old authors called it *Trifolium corniculatum*, alluding to the long ſeed-veſſels. Both theſe laſt are acid, and might ſupply the place of *O. Acetoſella*, if wanted for medical uſe.

O. *Barrelieri*. Twin-cluſtered Wood Sorrel. Linn. Sp. Pl. 624. Willd. n. 86. Jacq. t. 3. (Trifolium acetoſum americanum, rubro flore; Barrel. Ic. t. 1139.)—Stem erect, branched, leafy. Leaflets ovate, acute, ſtalked. Cluſters in pairs, on a ſolitary axillary ſtalk.—Native of the hotter parts of South America. We have it not in our gardens. Jacquin has it in his ſtove, and complains of the difficulty of ſaving ſeeds, as the capſules are ſo elaſtic. The *root* is fibrous and annual. *Stem* twelve or eighteen inches high, hairy, branched, leafy. *Leaves* on long ſtalks; *leaflets* ovate, acute, entire; the terminal one on a longer ſtalk than the lateral ones. *Flowers* ſmall, numerous, pale red, in a pair of divaricated, ſtalked, axillary cluſters. *Capſule* ſhort, ovate.

Sect. 8. *Leaves fingered.* Six Species.

O. *lupinifolia*. Lupine-leaved Wood Sorrel. Jacq. t. 72. Willd. n. 89. Ait. n. 55.—Stem none. Leaflets numerous, elliptic-lanceolate, glaucous, ſmooth. Stalks ſolitary, ſingle-flowered.—Native of the Cape.—The *leaves* ſpread like a fan; each leaflet has a black line at the baſe. *Flowers* large, of a golden yellow. This is a very handſome ſpecies, as well as Jacquin's *flava*, t. 73, which has narrow linear *leaflets*; *ſtabellifolia*, t. 74, and *pectinata*, t. 75, both which laſt have broader oblong *leaflets*, and ſeem to us one ſpecies, differing merely in the comparative proportions of their *ſtamens* and *ſtyles*, like others already mentioned.

If we thus preſume to curtail the ſpecies, we do it with much reſpect for the able authors who have ſo greatly augmented the number, and we merely wiſh to ſuggeſt our ſcruples, which are altogether theoretical, for the conſideration of practical obſervers and cultivators.

Sect. 9. *Leaves pinnate.*

This ſection is at preſent known to contain only

O. *ſenſitiva*. Senſitive Pinnate Wood Sorrel. Linn. Sp. Pl. 622. Willd. n. 93. Jacq. t. 78. f. 4. (Herba ſentiens; Rumph. Amb. 301. t. 104. f. 2.)—Leaves pinnate.—Native of the Eaſt Indies; unknown in our gardens. The *ſtem* is ſhort and ſimple, crowned with a tuft of very numerous *leaves*, compoſed of many pair of obtuſe *leaflets*. *Flowers* yellow, in numerous ſtalked umbels. S.

Oxalis, in *Gardening*, contains plants of the hardy, herbaceous, perennial kind, of which the ſpecies cultivated are; the common wood ſorrel (O. acetoſella); the upright wood ſorrel (O. ſtricta); the goat's-foot wood ſorrel (O. caprina); the ſtriped-flowered wood ſorrel (O. verſicolor); the purple wood ſorrel (O. purpurea); and the fleſh-coloured wood ſorrel, (O. incarnata.)

But there are many other ſpecies that may be cultivated.

*Method of Culture.*—The firſt ſort may be readily increaſed, by planting the divided roots in a moiſt ſhady bor-



der

der in the early ſpring ſeaſon, which afterwards require only to be kept clear from weeds.

And the other ſorts may be increaſed, by planting off-ſets from the roots or bulbs that come out from the ſides of the ſtems, in pots filled with good light mould, ſheltering them in the dry ſtove or under a frame during the winter, admitting as much free air as poſſible in mild weather. They only require to be protected in the winter ſeaſon afterwards, and occaſionally removed into other pots.

The two firſt ſorts and varieties may be introduced in the borders, and the others afford variety among other potted plants.

Oxalis, in the *Materia Medica*. The oxalis acetoſella is totally inodorous, but has a grateful taſte, ſo that it is uſeful in ſallads by ſupplying the place of vinegar, and which is more agreeable than the common ſorrel, (rumex acetoſa,) and approaches nearly to that of the juice of lemon, or the acid of tartar, with which it alſo correſponds in a great meaſure in its medical effects, being eſteemed refrigerant, antiſcorbutic, and diuretic. It is recommended by Bergius in inflammatory, bilious, and putrid fevers. The principal uſe, however, of the acetoſella is to allay inordinate heat and to quench thirſt; for this purpoſe, a pleaſant whey may be formed by boiling the plant in milk, which, under certain circumſtances, may be preferable to the conſerve directed by the London College, though an extremely grateful and uſeful medicine. Many have employed the root of Lujula, probably on account of its beautiful red colour rather than for its ſuperior efficacy. An eſſential ſalt is prepared from this plant, known by the name of "eſſential ſalt of lemons," and commonly uſed for taking ink-ſtains out of linen. This ſalt is made from the expreſſed juice. Thunberg found that the oxalis cornua of the Cape of Good Hope yields the ſalt in greater quantity than the acetoſella. This ſalt, when genuine, which is ſeldom to be procured ſo, is compoſed of the vegetable alkali and a peculiar acid, which ſeems more allied to the acid of ſugar than that of tartar. Bergman has given the method of ſeparating this acid (Act. Up. Nov. vol. ii. p. 215.), and it is related by Murray, Ap. Med. vol. iii. p. 497. What is ſold under the name of "eſſential ſalt of lemons" in this country, appears ſometimes to conſiſt of cream of tartar, with the addition of a ſmall quantity of vitriolic acid. The active principle of the expreſſed juice, which reddens vegetable blues, coagulates milk, and inſtantly precipitates lime from its ſolutions, is ſuperoxalat of potaſs, which is obtained cryſtallized from the juice, and ſold in the ſhops under the name of "eſſential ſalt of lemons." The ſame ſalt may be formed by cautiouſly dropping a ſolution of potaſs into a ſaturated ſolution of the oxalic acid, obtained from ſugar by the action of the nitric acid; the ſuperoxalat precipitates as ſoon as the proper quantity of alkali is added. On the continent this ſalt is prepared by the following proceſs: the juice is allowed to ſubſide after being ſlightly heated, and then clarified by adding to it water, in which a ſmall portion of fine clay is ſuſpended. This clarified juice is next boiled till a particle forms on its ſurface, and put aſide for a month to cryſtallize: the operation being repeated until the whole of the ſalt is obtained, when it is purified by a ſecond cryſtallization. Annal. de Chimie. xiv. 7. Woodville. Thomſon.

OXALME, in the *Materia Medica of the Ancients*, the name of a compoſition of vinegar and brine, made by a ſolution of ſea-ſalt in water. This was uſed externally in ulcers, and ſuppoſed of great ſervice againſt the bites of venomous animals, and for the curing children's ſcabby heads. It was alſo uſed as a ſtyptic poured into wounds, and was ſometimes given warm in clyſters; but theſe were always followed by thoſe of milk.

OX-BOOSE, in *Rural Economy*, a ſtall or place where oxen ſtand in the winter to be fed or fattened.

OXBOW, Great, in *Geography*, a bend of the river Connecticut, about the middle of the townſhip of Newbury, in Vermont; it contains 450 acres of the fineſt meadow land in New England.

OXELÆUM, a word uſed by many authors to expreſs a mixture of vinegar and oil, for outward application, in caſes of bruiſes and other injuries.

OXEN. See Ox.

Oxen *Creek*, in *Geography*, a river of Maryland, which runs into the Potomac, N. lat. 38° 55'. W. long. 37° 8'.

OXENBACH, a town of Auſtria; 9 miles S. of Ips.

OXENSTIERNA, Axel, *Count*, in *Biography*, a celebrated Swediſh miniſter, was born at Fano, in Upland, in 1583. He received his education at Roſtock, Wittenberg, and Jena, made great progreſs in the languages, and in various branches of ſcience, but he ſeemed particularly attached to theology. When he had finiſhed his academical ſtudies, he paid a viſit to moſt of the German courts; on his return he was received into the ſervice of Charles IX., who, in 1606, ſent him as envoy to the court of Mecklenburg. In 1609 he was admitted a member of the ſenate. The firſt public buſineſs aſſigned to him, was the adjuſtment of ſome differences that ſubſiſted between the Livonian nobility and the city of Revel, which he brought to a happy concluſion. He had now given ſuch a favourable diſplay of his talents, that the king, who was far advanced in life, made choice of him to be guardian to the royal family, and placed him at the head of the regency. On the acceſſion of Guſtavus Adolphus, he was promoted to be chancellor, and in 1613, when overtures were made for peace between Sweden and Denmark, he was appointed chief negociator on the part of the former. In the following year he accompanied the king in his expedition into Germany, and he had the ſatisfaction of ſeeing an end put to hoſtilities between Ruſſia and Sweden, by an honourable peace. He continued to advance in the confidence and eſteem of his ſovereign, till at length he was inveſted with full authority in all civil and military affairs on the Rhine, and the king having advanced into Bavaria and Franconia, Oxenſtierna fixed his head-quarters at Mentz, whence he proceeded with the troops that he had collected to join his majeſty, and then took up his ſtation with ſome regiments in the upper part of Germany, while Guſtavus advanced to Lutzen, where he fell in the arms of victory in the year 1632. Oxenſtierna was much afflicted, but not diſpirited, by this melancholy event. He collected more troops for the defence of Sweden and the allies; and undertook a journey to Dreſden and Berlin, to concert meaſures with the electors of Brandenburgh and Saxony, in regard to the proſecution of the war. An unlimited commiſſion was now given him by the Swediſh government, to purſue ſuch plans as he might think moſt conducive to the benefit of his country. He became director of the allied powers, diſtinguiſhed by the name of the Evangelic League. This elevation gave riſe to much diſcontent, and other circumſtances united with it threw things into confuſion. Oxenſtierna, however, by his prudent and judicious conduct, found means to revive the drooping ſpirits of his party, and to ſurmount every difficulty with which he was embarraſſed. He was recalled to Sweden in 1636, after an abſence of about ten years, reſigned the authority with which he had been inveſted, and took his ſeat in the ſenate as chancellor of the kingdom, and as one of the five guardians

dians of the queen. His chief care was now to inſtruct the queen in every thing that related to the art of government, and he had in a ſhort time the happineſs of being the means of concluding a peace by the famous treaty of Weſtphalia. He aſſiſted at Bromſebo at the negociation with Denmark in 1645, and on his return queeen Chriſtina conferred on him the title of count. At the ſame time he was choſen chancellor of the academy of Upſal, an office which he filled with zeal, aſſiduity, and ſucceſs. He oppoſed moſt earneſtly the intended abdication of the queen, and when he found his admonitions fruitleſs, he feigned indiſpoſition to avoid the mortification of being preſent at the debates on a meaſure which he conceived to be fraught with ſo much evil. He died in the month of Auguſt 1654, leaving behind him a great reputation for talents and diſintereſted virtues. "His character," ſays one of his biographers, "may be put in competition with that of the moſt celebrated men who have acted a diſtinguiſhed part on the grand theatre of the world; and his name will, at all times, be claſſed among thoſe who have done immortal honour to mankind. The natural powers of his mind were ſtrengthened by an excellent education, and by the ſtudy of the moſt uſeful ſciences. No perſon was better acquainted with the art of prying into the receſſes of the human heart; and the knowledge which he thus obtained he endeavoured to employ to the beſt advantage. His political ſagacity excited no leſs reſpect than admiration; and he lived at a period which gave him an opportunity of diſplaying, to its full extent, the ſtrength and ſolidity of his judgment. His eloquence was conciſe but nervous. He poſſeſſed the happy talent of foreſeeing the various reſults with which any meaſure might be attended, and of thence deducing the beſt rules for directing him in his public conduct. His integrity not only procured him friends, but enabled him to outſtrip all his competitors, and to overawe thoſe who were hoſtile to his deſigns. The ſtorms and vexations to which he was often expoſed, he withſtood with firmneſs, prudence, and magnanimity. The independence of his country was the darling object of his heart, and he poſſeſſed talents ſufficient to defend it againſt every attack. His name was celebrated all over Germany, and cardinal Richelieu was compelled to admit that his mind was an inexhauſtible ſource of wiſe counſels and prudent expedients." He was author of ſeveral works, of which a liſt is to be found in Stiernman's "Bibliotheca Suio-Gothica." The ſecond part of the "Hiſtoria Belli Sueco-Germanici," uſually aſcribed to P. B. Chemnitius, was compoſed by Oxenſtierna. Gen. Biog.

Oxenstierna, John, ſon of the preceding, was born at Stockholm in 1611. He was educated in a manner ſuitable to the rank of his family, and in 1631 he ſet out to improve himſelf ſtill farther by travelling in foreign countries. On his return he embraced a military life, and diſtinguiſhed himſelf ſo much by his zeal and activity in that department, that he was ſoon appointed colonel of a regiment in Germany. Being called by his father to Frankfort on the Mayne, to aſſiſt him in conducting the affairs of the evangelic league, he repaired to that city, and in 1634 was diſpatched thence to England on buſineſs of great importance. He was afterwards one of the commiſſioners for ſettling the affairs relating to Poland, and in 1641 was inveſted with full power as plenipotentiary to aſſiſt at the negociations for peace in Germany. Peace being concluded at Oſnaburg, Oxenſtierna was ordered by the queen to repair to Pomerania, to adjuſt ſome affairs with the elector of Brandenburgh; and on his return to Sweden he was appointed by Charles Guſtavus, who had then aſcended the throne, to be marſhal of the kingdom. In 1654 he was ſent again to Germany on public buſineſs, and died at Weimar, in December 1657. He was a man of great eloquence and extenſive knowledge. Whatever he undertook he exerted his utmoſt ability to accompliſh; and being guided in all his actions by a ſtrong ſenſe of rectitude, his conduct, on every occaſion, acquired for him eſteem and reſpect. Gen. Biog.

Oxenstierna, Eric, brother of the preceding, chancellor of Sweden, member of the ſenate, &c., was born at Fiholm, the ſeat of his family, in 1624. He ſtudied at Upſal, and in 1643 ſet out on a tour to Germany, with a view to improvement. On his return, queen Chriſtina appointed him firſt gentleman of the bed-chamber; but this office he reſigned in 1646, and was appointed governor of Eſthonia. He obtained other high offices in the ſtate, and was at length nominated vice-chancellor, in order that he might aſſiſt his father, now almoſt borne down by the weight of years and infirmity. After the diet of 1655, at which he proved by his talents that he was worthy of the confidence which placed him in that ſituation, he followed the king his maſter to Poland; and that country, as well as Pruſſia, having been reduced to the neceſſity of yielding to the Swediſh arms, Oxenſtierna was made choice of to conduct the negociations then entered into with the elector of Brandenburgh, which he brought to a happy termination. As a reward for this ſervice, he was raiſed by the king to be governor-general of Pruſſia, and this important office he retained till the period of his death, which took place at Elbing in 1656, when he was in the thirty-third year of his age.

OXEY, in *Rural Economy*, a provincial word, ſignifying like the ox, or of mature age, not ſteeriſh.

OX-FEET, a term applied to the feet of horſes, when the horn of the hind feet cleaves juſt in the middle of the fore-part of the hoof, from the coronet to the ſhoe: they are not common, but very troubleſome, and often make a horſe halt.

OXFORD, in *Geography*, a city and univerſity of Great Britain, is ſeated nearly in the centre of England, on the ſouthern border of Oxfordſhire, to which it imparts a name, and is the chief or principal town of that county. This city occupies a ſcite which plainly indicates a monaſtic origin; and indeed ſtill retains many external features and internal cuſtoms expreſſive of its primary eſtabliſhment. It formerly contained nineteen monaſtic houſes. In natural poſition it has neither a military nor commercial aſpect; but is ſeated in a flat, ſedgy country, on a tract of land bounded caſtward by the river Charwell, or Cherwell, and on the weſt by that of the Iſis. Theſe rivers ramify into numerous ſtreams at this place, and unite their accumulated waters on the ſouth ſide of the city. Both the rivers, as well as the city, have acquired claſſical celebrity by the harmonious ſtrains of different poets: Cowley, Pope, Prior, Phillips, Warton, and other modern authors, have attuned their reſpective lyres in praiſe of this "Modern Athens," as Camden ſtyles it. Wood, in "Athenæ Oxonienſes," mingling a little hyperbole with truth, pronounces Oxford "the moſt noble theatre, and emporium of all good ſciences, the very ſource and moſt clear ſpring of good literature and wiſdom; from which religion, civility, and learning have ſpread moſt plentifully through all parts of England, and beyond the ſeas." Many topographers and antiquaries have alſo evinced much labour and reſearch in developing the hiſtoric annals of the univerſity; but though ſeveral volumes have been appropriated to the ſubject, there is ample ſcope for a new work, to include all the eſſential information of former writers, with judicious criticiſm, antiquarian elucidation, and accurate illuſtration.

The appearance of Oxford from the high grounds to the eaſt and ſouth-weſt is ſingularly picturesque and intereſting; it

it comprehends groups of towers, domes, ſpires, pinnacles, and turrets, intermixed with ſolemn maſſes of foliage; and ſurrounded by verdant meadows, interſected by ſeveral ſtreams. Occaſionally the latter preſent an ocean-like appearance; when the ſwoln waters overflow their natural bounds, and inundate the flat lands. At ſuch a time Oxford ſeems like an iſland; but it is an iſland filled with monaſtic palaces, intermixed with groves and gardens. In ſpring and autumn this effect is not unfrequent. The approaches to the city, from the eaſt, the London road, from the north, the weſt, and the ſouth, are all very impoſing and beautiful; and each preſents a very diſſimilar appearance and effect to either of the others. From the eaſt, Magdalen bridge, with the towers and groves of that college, and the rich botanic gardens, are ſeen near the fore-ground, over and beyond which the eye catches partial views of the towers and ſpires of St. Mary's, All-Saints, Chriſt-church, and other lofty buildings. On paſſing the bridge, and proceeding up the High-ſtreet, certainly one of the fineſt in Europe, the fronts of ſeveral colleges, churches, and private dwellings, are gradually and ſucceſſively unfolded to the ſight. This ſtreet is broad and long; it has a gentle bend or curve in its whole extent, and this conſtitutes one of its fine features. At almoſt every ſtep the paſſenger is preſented with new objects, and fine combinations; and at one point the whole coup d'œil is ſingularly impreſſive and picturesque. This is at a broad part of the ſtreet, near the middle, where Queen's college, on the right hand, and Univerſity college, on the left, form the fore-ground of the ſcene, whilſt the front of All-Souls, the ſteeple and rich windows of St. Mary's church, the modern ſpire of All-Saints church, and the old tower of St. Martin's, conſtitute the prominent features in the diſtance; and all together preſent a ſtreet ſcene of unrivalled beauty, variety, and effect. This ſcene, heightened by the glow and brilliancy of the ſetting ſun, is rendered ſtill more impreſſive. (See a very fine print of it, 24 inches by 16, engraved by J. Pye, from a painting by J. M. W. Turner, R.A.) The other entrances to Oxford, though not ſo intereſting as this, are all grand, and highly prepoſſeſſing; and each is calculated to ſtimulate the curioſity of the ſtranger, and excite emotions of anxiety and pleaſure. A broad ſtreet, ſkirted with rows of old trees, and flanked by the obſervatory, St. Giles's church, St. John's college, and many private houſes, is the approach from the north; whilſt the oppoſite entrance is from meadows over three or four bridges, where the noble towers and turrets of Chriſt-church, with its vaſt grove of ſtately elms, conſtitute the chief feature. On the weſt the road is extremely unlike either of the former; and though not ſo grand and ſo architectural as thoſe, is ſingular and curious. An artificial cauſeway, or raiſed road, with ſeveral bridges over different branches of the Iſis, has been formed through the level meadows, for a full mile in length, and in nearly a ſtraight line. At the eaſtern termination of this, and at the weſtern extremity of the city, is a lofty conical mound, formerly the keep of the caſtle, with an ancient caſtle tower and ſome modern towers, which now conſtitute the county gaol.

The whole buildings of this city occupy an area of ground extending about one mile from north to ſouth, and the ſame length from eaſt to weſt. It is interſected in the ſame direction by two principal thoroughfares, or ſtreets, with ſeveral ſmaller ſtreets and lanes. On the ſouth, eaſt, and weſt, it is ſkirted by meadows, and on the north by corn fields. The latter ſide was formerly guarded by three different lines of fortification: a bold foſſe and ditch, at ſome diſtance from the buildings, extended from the river on the eaſt to the river on the weſt, and a lofty wall with baſtion towers, incloſed the chief buildings of the city on the ſame ſide. The city of Oxford, with its immediate ſuburbs and liberties, compriſes fourteen pariſhes.

In the following hiſtory and deſcription of this renowned ancient univerſity, but modern city, we propoſe to be more circumſtantial than in the generality of our topographical articles; becauſe, on examining other Cyclopædias, Gazetteers, and general geographical works, we find it has been very imperfectly and inaccurately treated. In the ſequel we ſhall particulariſe our authorities.

*Hiſtorical Events.*—As may be readily conjectured, the origin and ancient hiſtory of the town and univerſity have been ſubjects of anxious inveſtigation among the learned in different ages; and much curious, but fanciful ſpeculation, has been exhibited by thoſe who were ambitious to beſtow on it a claim to very remote antiquity. John Roſs, or Rous, whom Dugdale terms a "famous antiquary," even aſſerts, that a town was built here by Memphric, king of the Britons, upwards of a thouſand years before the Chriſtian era. This town, the ſame author obſerves, was firſt called Caer-Memphric, in honour of its founder; then Belleſitum, from a pretty mountain near it; afterwards Ridohen, implying, in the Celtic language, a ford of oxen; and Caer-Voſſei, from Boſſo; the name of an earl who was contemporary with king Arthur.

Such a view of the origin of Oxford, however, though accredited and repeated by ſeveral of the moſt diſtinguiſhed antiquaries of modern times, is juſtly conſidered by Camden and others to be fabulous, as the hiſtorian above quoted does not pretend to have derived his information on this ſubject, from any more authentic ſource than the legendary tales of the Britiſh bards. What ſtrongly corroborates their opinion is, the fact, that no mention of Oxford occurs during the Roman era; for the idea of Wood and Leland, that it was the *Calleva* of that celebrated people, and a place of ſplendour and notoriety under their government, has been proved to be altogether erroneous. The ſame doubts cloud the hiſtory of Oxford during the early part of the Saxon dynaſty, as at any former period. Indeed, no credit can be given, by the rational enquirer, to any ſtatement reſpecting it till the reign of Alfred, when it appears to have been famous for a monaſtery dedicated to the Holy Trinity. This was founded in 727, and was moſt probably the nucleus whence the town actually derived its origin, by collecting around it the habitations of the laity. At all events, whether this was the ſource of its exiſtence or not, it is certain that a town of ſome kind occupied the ſcite of Oxford in the tenth century. In 979 it was moſtly burnt, and in 1002 again ſuffered the ſame fate. It ſoon revived, however, but only to encounter freſh diſaſters. In 1009, Swein, king of Denmark, ſet fire to it; and when, in revenge, king Ethelred ordered a general maſſacre of the Danes throughout all his dominions, the command was executed with terrible fidelity at Oxford. No regard was paid either to ſex or age; even the altars were polluted with the blood of the devoted victims. Among thoſe who periſhed on this occaſion, was the lady Gunilda, ſiſter to the Daniſh monarch.

This ſavage policy of the Saxon king inflamed the reſentment of Swein to the higheſt pitch; he conſequently made a deſcent upon England with an overwhelming force, and laid in aſhes many of the principal towns; but it appears that he only frightened the inhabitants of Oxford into a ſurrender, and impoſed upon them a heavy contribution. About three years after this event, Ethelred having returned from France, whither he had fled to avoid the vengeance of Swein, invited ſome of the Daniſh nobles hither to a conference, and treacherouſly cauſed two of their number

number to be put to death. The remainder, fearing the ſame fate, immediately took to arms, but were overpowered; and either fell by the ſword, or were conſumed in the conflagration of St. Frid's church, in which ſome of them had ſought protection from the rage of their aſſailants. During the ſubſequent conteſts of the Danes and Saxons, Oxford frequently ſuffered ſeverely. It attained, however, at this period, a very high degree of political importance. King Edmund, ſurnamed Ironſide, occaſionally reſided here; and was unhappily murdered in the town, November 30th, 1016. Canute the Great held his court frequently at Oxford; and in 1022 he aſſembled here a general council, in which the laws of Edward were diſcuſſed, and made binding upon all his ſubjects, Danes as well as Engliſh. The ſame monarch, in a ſubſequent parliament, confirmed the edicts of king Edgar. Harold, ſurnamed Harefoot, likewiſe fixed his chief reſidence at this place, which was the ſcene both of his coronation and of his death. When William the Conqueror made a progreſs to the north, after he had been crowned at Weſtminſter, the inhabitants of Oxford being much attached to their deceaſed ſovereign, refuſed to open their gates to the uſurper of his throne. The king was therefore compelled to obtain entrance by force of arms; and as a puniſhment for their reſiſtance, he levied upon the townſmen a tax much higher than was paid by other towns. The better, however, to reſtrain their rebellious ſpirit, he conferred the government of Oxford on Robert de Oigli, a Norman of tried valour, and empowered him to build and fortify a caſtle. This ſtructure was of great ſize and ſtrength, and was raiſed on the weſt ſide of the town, near the river.

After the completion of the caſtle, Oxford became more ſubmiſſive, and long before the termination of the Conqueror's reign appears to have been perfectly reconciled to the Norman government. The immediate ſucceſſors of William frequently made it the place of their reſidence, and on ſeveral occaſions ſummoned parliaments and councils to it. When king William Rufus found his throne threatened by formidable inſurrections in the north, he convened a general council here, and declaring his reſolution to govern his ſubjects with ſtrict impartiality, ſucceeded in confirming the allegiance of many of his great barons, who might otherwiſe have deſerted his intereſt; and through their means was enabled to quell the revolt. King Stephen ſeveral times held his court here; and during the conteſt for the crown between him and the empreſs Maud, the latter having taken up her abode in the caſtle, was beſieged in it by the king in perſon, and only effected her eſcape, by ſtratagem, the day previous to its ſurrender. In 1154 a council met at Oxford, and it was formally agreed that Stephen ſhould retain the crown till his death, when it was to devolve on prince Henry, ſon to the empreſs.

Henry II. convened ſeveral councils at Oxford; and in the year 1177, the princes and chief lords of Wales did homage to him here for their territories and eſtates. This monarch reſided, during a great part of his reign, in the palace of Beaumont, which had been erected in the north ſuburbs by Henry I. Within the walls of that ſtructure, his heroic ſon, Richard Cour-de-Lion, was born, and ſubſequently held one council here anterior to his departure for the Holy Land. King John paſſed many of his troubled hours in the ſame palace; and had a meeting with his indignant barons in the vicinity about two months before he was compelled to ſign that grand bulwark of Engliſh liberty, Magna Charta. Henry III. following the example of his predeceſſors, occaſionally fixed his abode at Oxford, and held many parliaments and councils here on ſubjects of great political importance.

In the reign of Henry VIII. Oxford was conſtituted the ſeat of a biſhop's ſee, and conſequently elevated to the rank of a city. By order of queen Mary, archbiſhop Cranmer, with biſhops Ridley and Latimer, were executed here, October 1555, for herefy to the Romiſh church. Her ſucceſſor, queen Elizabeth, frequently viſited Oxford, as will be more particularly mentioned in the ſequel of this article. In the year 1577 the plague raged with dreadful mortality in this town. While the court ſat on the trial of a popiſh bookſeller, accuſed of circulating offenſive pamphlets, a ſudden ſickneſs ſeized nearly the whole of the perſons preſent; and within forty hours upwards of 300 perſons died, among whom were the lord chief baron, the high ſheriff, ſeveral juſtices of the peace, and moſt of the jurors. The effect of the earthquake in 1580 was ſeverely felt at Oxford. The inhabitants quitted their houſes in great terror; but no very ſerious damage was done notwithſtanding the violence of the emotion. King James I. withdrew to this city when the plague broke out in London. The malady, however, likewiſe found its way hither, and began its devaſtations with ſuch awful effects, that the ſcholars fled from the univerſity, and the citizens ſhut their ſhops. "Not a living creature," ſays Ayliffe, "beſides nurſes and corpſe-bearers, was to be ſeen in the ſtreets, which were covered with graſs, even in the market-place."

Charles I. held a parliament at Oxford in the early part of his reign; and at a ſubſequent period, when he found it expedient to quit London, he choſe this city for his place of abode, being well aſſured of the loyalty of the citizens, and of the collegians. The whole melancholy winter of 1646 was ſpent by that monarch within the walls of Chriſt-church, where he aſſembled the ſhattered remains of his parliament, and whence he wrote the memorable letter to lord Digby, declaring, that "if he could not live as a king, he would die as a gentleman." The negociations for peace between Charles and the republican parliament were chiefly carried on at Oxford; but no military event of any conſequence occurred here throughout the war, though the city was ſtrongly fortified, and its poſſeſſion conſidered an object of great importance to both parties. It was ſurrendered by the expreſs command of the king himſelf, after he had been made priſoner by the Scots.

The laſt parliament which met at Oxford was convened in the year 1681, by king Charles II. As party ſpirit then prevailed in a very high degree, its meeting was attended with many hoiſterous circumſtances. The popular faction affecting to dread ſome ſecret machinations among the Papiſts, their repreſentatives entered Oxford with a large train of ſervants and partizans as body guards. Numerous bands of ſoldiery were drawn up round the royal quarters; and on the whole, according to Hume, "the aſſembly rather bore the appearance of a tumultuous Poliſh diet than of a regular Engliſh parliament." This parliament laſted only ſeven days, having been diſſolved by the king to prevent a bill of baniſhment and excluſion from the throne being paſſed againſt his brother James, duke of York, afterwards James II., in whoſe reign many ſcenes of turbulence happened here, in conſequence of his illegal interference with the civil rights both of the city and univerſity. Since that time the annals of Oxford afford no very eminent hiſtorical particulars.

*Origin and Hiſtory of the Univerſity.*—The origin of the univerſity is no leſs involved in doubt and obſcurity than the early annals of the town. Indeed few circumſtances have occaſioned more zealous diſcuſſion than the comparative antiquity of this and the ſiſter univerſity of Cambridge. Numerous eſſays have been written on both ſides of the queſtion;

queſtion; in which much learning and curious inveſtigation have been diſplayed, but ſcarcely a ſentence of ſatisfactory information can be extracted from the voluminous maſs. Some of the more eager diſputants for the remote antiquity of Oxford contend that it was a ſeminary of learning immediately after the deſtruction of Troy. "The ſtudies of literature," obſerves Middendorp, "flouriſhed here ever ſince thoſe excellent philoſophers, with the Trojans, coming out of Greece, under the command of Brute, entered and ſettled in Britain." Other writers, leſs fantaſtical, wiſh to ſhew that the univerſity was founded by Arviragus, a Britiſh king, who lived in the time of Domitian, about ſeventy years ſubſequent to the Chriſtian era. A third claſs, with greater appearance of candour, decline to affix any preciſe date to its foundation, but uphold the opinion that it took place during the government of the Romans. All theſe notions, however, we are decidedly inclined to treat as chimerical, and unworthy of the ſmalleſt attention. We ſhall, therefore, paſs them over without further remark, and deſcend to a later period.

Among the many national improvements attributed to the great Alfred, the foundation, or, as ſome will have it, the reſtoration, of the univerſity of Oxford, is one of the moſt eminent. John Rous, the hiſtorian already mentioned, affirms, that he eſtabliſhed within this city, at his own expence, three teachers of grammar, arts, and divinity, in three different places. One of the fragments of Leland ſays, "Alfred founded the univerſity of Oxford at the inſtigation of his brother St. Neot;" and in the edition of Aſſer, the contemporary of the monarch, which was publiſhed by Camden in 1603, there are ſeveral paſſages corroborative of this aſſertion. The critical inquiries of ſucceeding writers, however, have clearly proved theſe paſſages to be interpolations, and to have formed no part of the genuine work of Aſſer. Many concluſive arguments have likewiſe been adduced to ſhew that Alfred never founded any ſchool eſtabliſhment, except that of Wincheſter. Whitaker, in his "Life of St. Neot," is particularly pointed in expoſing the abſurdities and contradictions by which the forgery is detected. The interpolated paragraphs do not appear in the older MS. publiſhed by archbiſhop Parker in 1574; nor in that in the Cottonian library ſince burnt, which Wanley dates about a century after Aſſer. Add to this, the fact that no mention is made of Alfred in the early ſtatutes, or other records of the univerſity, and it is not poſſible to reſiſt the conviction that Alfred had no concern either in its original foundation, or its revival at any ſubſequent period.

At what time then, it will perhaps be aſked, was the univerſity really founded? To this queſtion our anſwer is, that its progreſs to that rank was gradual, and that, in all probability, no regular ſyſtem of education, or corporate body for the purpoſes of learning, exiſted at Oxford till about the twelfth or thirteenth century. It is admitted, however, that there were numerous ſchools for the acquiſition of knowledge eſtabliſhed here at a much earlier date, but theſe were either of a private nature, or attached to ſome of the religious houſes with which the town abounded. The clergy, before the conqueſt, monopolized the ſmall portion of learning, which, in thoſe early days, was permitted to enliven the otherwiſe dark and cloudy atmoſphere of European ignorance. They were almoſt the only teachers to whom the people could apply for inſtruction. Every monaſtery, therefore, was in fact a ſchool; and whenever there chanced to be a number of them at one place, it might not improperly be called a ſeat of learning. It could not, however, be regarded in the light of an univerſity, as that term, in its modern ſignification at leaſt, implies a corporate eſtabliſhment, with the privileges of holding property and conferring degrees. In Domeſday-book no mention of ſuch a corporation occurs at Oxford.

Under this view of the ſubject it ſeems reaſonable to conclude, that when the Conqueror mounted the throne, Oxford enjoyed no greater pre-eminence in learning than what naturally reſulted from the number of its monaſtic eſtabliſhments, and from the circumſtance of its having been, during the preceding century, a favourite reſidence of the Engliſh monarchs. This, indeed, was a certain degree of diſtinction; and would aſſiſt in paving the way to the future celebrity of the town. Its ſchools might for theſe reaſons be more numerous, and better attended than in other towns, and might poſſibly poſſeſs ſome few trifling privileges, which would be gradually augmented, till the plan of a modern univerſity was completed.

Henry I., having been educated here, ſeems to have paid great attention to Oxford as a ſeminary for learning, and is ſaid to have granted to the teachers and the ſcholars ſome important privileges in their individual capacity. In the reign of Stephen learning ſunk to a very low ebb, and continued in the ſame degraded ſtate during that of his ſucceſſor Henry II. Richard I., however, ſtimulated its revival in every part of his dominions, but eſpecially gave encouragement to Oxford, becauſe of its having been the place of his birth. Many new halls or ſchools were eſtabliſhed under his royal patronage, and with money iſſued by his command from his own exchequer. To ſo flouriſhing a condition, indeed, did he raiſe Oxford, that the number of ſcholars at its ſeveral halls, in the early part of the ſucceeding reign, is ſtated to have been not leſs than three thouſand. But an unfortunate incident, in the year 1209, interrupted this courſe of proſperity, and even threatened the total deſtruction of the town, as a ſeat of knowledge. A ſtudent, engaged in ſome active exerciſe, accidentally killed a woman belonging to the town, and dreading puniſhment, was ſo imprudent as to fly from juſtice. The mayor and burgeſſes, upon being apprized of this occurrence, immediately ſurrounded the hall to which the ſuppoſed murderer belonged, and demanded his perſon. The maſter and ſcholars replied that he had fled; but this anſwer would not appeaſe the clamours of the multitude, who ſeized three ſtudents, entirely unconnected with the tranſaction, and obtaining an order from king John for their execution, hanged them without trial or proof. The teachers and ſcholars, juſtly enraged at this barbarous treatment, unanimouſly quitted Oxford, and retired, ſome to Cambridge, ſome to Reading, and ſome to Maidſtone in Kent. Nay, ſo far did they carry their revenge that they applied to the pope, and obtained a papal interdict againſt the town, and againſt all perſons who ſhould ſettle in it for the purpoſes of teaching. This meaſure effectually humbled the inhabitants, who ſoon after waited upon the pope's legate, and having begged pardon, and expreſſed the deepeſt contrition for their conduct, obtained abſolution upon conditions very favourable to the ſcholars. They conſequently returned to their ancient habitations, and the king himſelf beſtowed upon them ſeveral new immunities, and among others that they ſhould not be obliged to appear at any foreign judicature, "and that they might have cognizance in cauſes where one party is a ſcholar, or the ſervant of a ſcholar."

In the reign of Henry III., anno 1229, a ſerious diſpute having ariſen between the ſtudents and citizens of Paris, the king ſeized the opportunity to advance the intereſts of Oxford, by inviting the Pariſian maſters and ſcholars to ſettle there. Accordingly no fewer than one thouſand of them reſorted hither, but theſe foreigners introduced ſuch a

dangerous levity of manners, that tumults were continually breaking out, and caused great alarm and disquiet in the town. They had sometimes even the audacity to interfere in political matters. When prince Edward marched towards Wales, after his return from France, the burghers having forbid him entrance into the town, on account of the disturbed state of the realm, the scholars demanded to be let out to meet and salute him at his quarters without the walls. But this being denied by the bailiffs, they armed themselves and brok· open one of the gates, when a furious scuffle ensued, and terminated in the complete rout of the townsmen. In consequence of this the king, who was on the eve of holding a parliament at Oxford, required the students to retire from the town until the parliamentary sitting was concluded. The chief part of them therefore repaired to Northampton; and here they became implicated in a more serious affair than that which had occasioned their removal. Offended at the king's command, which they regarded as a punishment, they joined the insurgent barons in the defence of that town against the royal forces, and fought with such desperation, that the monarch would have proceeded against them with the utmost rigour after its surrender, had his vengeance not been restrained by prudential motives.

In such circumstances as we have described, it may reasonably be supposed, that though the number of scholars during the reign of Henry III. was very great, yet the real votaries of learning were comparatively few. But still amongst these few some names have attained considerable distinction from their eminence in the fashionable literature of the age, which was deeply corrupted with the subtleties of the Aristotelian philosophy, and the mysterics of theological belief. The reign of Henry, however, will be always memorable in the annals of the university, on account of an important acquisition of private patronage which prevailed towards its conclusion. Previous to that period the teachers and scholars lodged, and studied in mansions, or halls, rented from the townsmen; and this was one great source of the numerous quarrels which were constantly taking place between them. To remedy this evil, as well as to encourage learning, by conferring upon its professors more complete independence than had hitherto been enjoyed, several public spirited individuals purchased, or built, large houses for their reception, and set the example of appropriating funds for the support of those who might not possess the competent means of pursuing their studies to advantage. By such progressive steps a taste for erecting and endowing colleges was introduced, and first modified, and at length supplanted that which had so long prevailed for the foundation of religious houses, the nurseries of superstition and scholastic sophistry.

The reign of Edward I. is marked with no very interesting features in the annals of literature. That prince, continually occupied in war, and in schemes of political aggrandizement, had little leisure to attend to the advancement of learning. Some privileges, however, were conferred on the university in his time; and towards the conclusion of his reign a violent dispute arose between the university, for such the school establishments here had now really become, and the bishop of Lincoln, in whose diocese Oxford was then included. This dispute related to the limits of the bishop's jurisdiction in university matters, and ultimately led to the total emancipation of the learned body from ecclesiastical authority, under the sanction of a papal bull, granted by pope Boniface in the year 1301.

Edward II. granted many additional privileges to the university, and confirmed all the grants of his predecessors. Notwithstanding this, however, party feuds were incessant, and occasioned much retardation to the progress of learning. The preaching friars claiming the right of conferring degrees, independently of the university, a violent contest arose on this point; and an appeal was made by both sides to the pope, who, rather inclining to favour the friars, granted them an exemption from the chancellor's jurisdiction. But the king, at the intercession of the university, decreed that this deed should be held as void, and ordered that such of the friars as refused to acknowledge the chancellor's authority within the precincts of the university, should be punished with the utmost rigour. In this monarch's reign *lectures* were first instituted in the Hebrew language. The original lecturer, John de Bristol, a converted Jew, is said to have been a man of greater science and erudition than was common in his age, and his lectures were received with the greatest approbation.

Edward III. having been educated at Oxford, retained, during his whole life, a high veneration for the university, and was more liberal in his grants to it, than any of his predecessors. Though almost constantly engaged in plans of ambition, the execution of which has afforded matter of wonder to succeeding ages, his vast and capacious mind did not forget the interests of literature. He effected many regulations in the police of the town, highly useful, and calculated to promote the health and comfort of the numerous students by which it was frequented. While he added progressively to the power of the superior officers of the university, he was equally careful to increase the consequence and security of the scholars. He took the most decided measures to root out the ancient animosity arising from difference of country as to north and south, which had given birth to many dangerous tumults, and endeavoured to turn the current of jealousy into the channel of emulation. The state of society, however, had not yet advanced far enough to teach men to restrain their ardour in debate within the bounds of decorum. The increase of learning augmented the violence of discussion on doctrinal points, and the university became split into sects or parties, not one of which recollected that urbanity should form the basis of disputation. Among the more celebrated of the disputants at this period, were Duns Scotus, and Oakham. The former was the founder of the sect called the Nominals, and the latter the patron of the Reals. The distinction between these sects does not appear clearly upon record, but one subject of difference was the relative authority of the civil and ecclesiastical power. Oakham, who maintained the pre-eminence of the civil power, is said even to have convinced the pope himself by the influence of his oratory. He was styled by his holiness the Invincible Doctor, and his antagonist the Subtile Doctor.

The plague, which occurred in 1349, nearly ruined the university; all the colleges and halls having been deserted and shut up during its prevalence. When its rage ceased, however, the scholars began to return, and by slow degrees their studies were again resumed. Durham college was founded shortly after this event, and king Edward, in order to restore the university to its ancient splendour, confirmed all the former charters, and granted some new privileges.

The reign of Richard II. is distinguished by the appearance, at this university, of one of the brightest luminaries that had hitherto enlightened the religious hemisphere. We allude to Dr. John Wicliffe, a man whose name is yet deservedly venerated by all who regard the reformation as an occurrence favourable to the interests of Christianity, and to the progress of the human mind. This eminent character was the first warden of Canterbury college; and it was at Oxford that

that he read thoſe lectures on divinity which laid the baſis of the religious liberty we now enjoy. He looſened the ſhackles of papal thraldom which Henry VIII. afterwards burſt aſunder, though from motives of a very oppoſite nature to thoſe which animated the father of the reformers.

No ſooner were the doctrines of this great man divulged at Oxford, than they were approved of by the judicious, and received with enthuſiaſm by a large proportion of the univerſity. So ſtrong, indeed, was the ſentiment in their favour, that when pope Gregory ſeverely reproved the chancellor's neglect in ſuffering the hereſy to diffuſe itſelf, the proctors, and many of the maſters, heſitated much, whether they ſhould receive or reject the bull, as a new and unheard-of meaſure. (See WICLIFFE.) But though the ſpirit of the univerſity was thus favourable to liberty of opinion, learning was by no means in a flouriſhing condition at this era. The number of ſtudents had greatly diminiſhed; and many of the halls and ſchools were let for purpoſes entirely different from their original deſtination. Some new foundations, however, took place during this reign; but the ages which ſucceeded were dull and ſordid in a lamentable degree. The reigns of Henries IV. V. and VI. are only memorable for the violence of the religious diſſentions which prevailed, and had nearly produced a diſſolution of the univerſity. Henry VI. indeed, profeſſed much love towards Oxford; but his affection produced no ſolid benefit. The finances of the univerſity were low in his time, even to penury. Learning fell completely to decay, particularly that connected with the Latin language; and a general ſyſtem of bribery and corruption degraded the church. Benefices were diſpoſed of for intereſted conſiderations to perſons not in holy orders, while men of talent, and of long reſidence in the univerſity, were ſuffered to remain unnoticed in the ſecluſion of their reſpective colleges. Thus circumſtanced, the acceſſion of the houſe of York was viewed by many of the collegiates as a matter of indifference, and by ſome was even hailed with joy, from a hope that their ſituation might be bettered under the new dynaſty. Nor were they deceived in their expectations, for no ſooner was Edward IV. ſeated on the throne, than he aſſumed the title of "Protector of the Univerſity," and in many reſpects proved a zealous friend to the cauſe of learning. Richard III., who is commonly, but unjuſtly, ſtigmatized as the worſt of tyrants, was likewiſe a great benefactor to the univerſity, and an encourager of literature. Among many other judicious meaſures adopted by this monarch for its advancement, he paſſed a law, empowering the univerſity "to import or export books at pleaſure;" a permiſſion which may be rationally conſtrued to ſignify an entire freedom of the preſs, and liberty of diſcuſſion.

The reign of Henry VII. from a variety of fortuitous cauſes, is entitled to the proud diſtinction of having foſtered, with more than common ſucceſs, the revival of learning. From the many diſcouraging particulars of the preceding century, genuine ſcholarſhip had become almoſt an obſolete character, in a profeſſional light. The Greek language had not only fallen into general diſuſe, but was affectedly held in contempt, by a great body of the ſcholars, who formed themſelves into an aſſociation under the name of Trojans. So ſtrong, indeed, were the exiſting prejudices againſt this noble and harmonious language, that when Eraſmus repaired hither for the purpoſe of teaching Greek, ſeveral leading men in the univerſity read lectures againſt him in the ſchools, and endeavoured to attach ridicule both to the man, and to the knowledge which it was his object to diſſeminate.

The period during which Henry VIII. held the ſceptre, is, in ſome reſpects, one of the brighteſt in the annals of the univerſity. Soon after his acceſſion, this prince confirmed all the grants of his predeceſſors, and honoured Oxford with a regal viſit. Wolſey, ſo celebrated for his unexpected elevation to the higheſt pinnacle of power, for his talents, and for his fall, proved himſelf one of the moſt munificent patrons of learning that graced his own or any other age. In 1518 this illuſtrious prelate and ſtateſman founded ſeven lectures for theology, civil law, phyſic, philoſophy, mathematics, Greek, and rhetoric, and appointed to all ſuch men as were moſt diſtinguiſhed for their abilities and for their knowledge in theſe reſpective branches of learning. His efforts to promote the good of the univerſity were indeed vigorous and uniform. Through his means the Greek language was again received into eſtimation, and a taſte for elegant literature was introduced, and this happily ſupplanted the quibbling ſophiſtry which had hitherto occupied the chief attention of the learned. Wolſey alſo founded the college, now called Chriſt-church. About the ſame time the colleges of Brazennoſe and Corpus Chriſti were alſo founded, the former by Wm. Smyth, biſhop of Lincoln, and ſir Robert Sutton, and the latter by Richard Fox, biſhop of Wincheſter.

Two events of a political nature happened in this reign, which may not improperly claim ſome notice in an hiſtorical ſketch of the univerſity. The firſt was the divorce of queen Catharine of Arragon, on the legality of which the king thought proper to conſult the Oxonians; and with ſome difficulty ſucceeded in obtaining an anſwer favourable to his wiſhes. The ſecond related to his intention of declaring himſelf "Head of the Church," on which ſubject he likewiſe took the ſenſe of this univerſity, and was confirmed in his purpoſe by their almoſt unanimous vote. It was ſoon perceived, however, that his object in this meaſure was not freedom from foreign domination, but the ſpoliation of the church, and, therefore, their acquieſcence in his views was naturally at an end. The univerſity now preſented a moſt diſmal ſpectacle. The plague, together with the calamities of the church, concurred in driving the ſtudents from their habitations, and ſo few in number were thoſe who reſorted hither at this era, that in the year 1546, only ten inceptors in arts, and three in divinity and law, are recorded.

The acceſſion of Edward VI. brought with it evils of no leſs magnitude than thoſe which marked the footſteps of his father. The firſt act of this young prince's counſellors, (for to them muſt belong the merit or demerit of almoſt every act of his reign,) was a groſs infringement on the rights and privileges of the univerſity, as it directed, "that no gownſmen ſhould concern themſelves at the election of any preſident, fellow, or ſcholar, or do any thing to oppoſe the viſitation now ordered by the king." Accordingly, when the threatened viſitation took place, the royal commiſſioners executed whatever meaſures they deemed proper. They entirely changed the form of the univerſity government, and framed a new code of ſtatutes, called Edward's ſtatutes, which remained in force until archbiſhop Laud introduced a better model. They, moreover, deſpoiled the libraries, and deſtroyed many rare manuſcripts on ſubjects of ſcience, merely becauſe they had been written by votaries of the old ſchool. This treatment ſo inflamed the few remaining ſcholars, that the greater part of them quitted Oxford, and retired to foreign ſeminaries to proſecute their ſtudies.

When queen Mary aſcended the throne, the ancient forms and government were again eſtabliſhed, and the late regulations completely abrogated. The popiſh party, now in their turn predominant, was not behind its antagoniſts in the work of cruelty and deſtruction. The ingenious arts were conſigned to contempt; the divinity ſchool was ſeldom opened; for which reaſon the ſtipend of queen Margaret's lecture was converted to the uſe of repairing the ſchools; there

was ſcarcely one ſermon preached in the city in a month; public lectures were neglected, either through inſufficiency or idleneſs. The Greek tongue again fell into almoſt total diſuſe, and, in general, learning, in every branch, was ſunk to the loweſt ebb. For ſix years there were only three inceptors in divinity, eleven in civil law, and ſix in phyſic. Of maſters of arts there were during one year only eighteen, another nineteen, another twenty-five, and another twenty-ſeven, in the whole univerſity.

The death of Mary, without iſſue, gave Elizabeth poſſeſſion of the regal ſceptre at a moſt critical juncture for the united intereſts of religion, as well as of learning. This wiſe and politic princeſs reverſed all that her ſiſter had effected in the conſtitution of the univerſity. But, unlike her predeceſſors, ſhe conducted the change with gentleneſs and moderation. Objectionable individuals were ſimply deprived of their places, or induced to reſign, and no greater puniſhment than a few days impriſonment was inflicted, even upon the obſtinate oppoſers of the queen's meaſures. Theſe, however, were ſome time before they produced the deſired effect of reſtoring the univerſity to any tolerable degree of proſperity. The ſhock occaſioned by the verſatile ſtate of the court-religion, during the three previous reigns, and the conſequent uncertainty of eccleſiaſtical proviſion, was not to be quickly overcome. In the year 1560, not one perſon performed theological exercifes in the ſchools, and only one in civil law, and three in phyſic. No divine, legiſt, or phyſician, ſtood that year for a degree. In 1563 there were only three univerſity preachers in Oxford, and two of theſe ſhortly afterwards retired. Hence the pulpit was frequently ſupplied by laymen. Mr. Taverner, ſheriff of Oxfordſhire, mounted the pulpit, with his ſword by his ſide, and his golden chain of office round his neck, and preached a ſermon to the academics. This event ſufficiently evinces that the condition of eccleſiaſtical literature muſt have been low indeed, or the Oxonians never could have liſtened to ſuch flagrant abſurdity as the following. "Arriving at the mount of St. Mary's," ſays this preacher at the commencement of his ſermon, "in the ſtony ſtage where I now ſtand, I have brought you ſome fine biſcuits baked in the oven of charity, carefully conſerved for the chickens of the church, the ſparrows of the ſpirit, and the ſweet ſwallows of ſalvation."

In the 13th year of queen Elizabeth the two univerſities were incorporated by act of parliament; and two years ſubſequent, the obligation of ſubſcribing the articles of the church of England began to be rigidly enforced on all who entered into the miniſtry. This occaſioned conſiderable diſturbance, as there were many perſons in the univerſity who favoured the puritanical doctrines, and peremptorily refuſed their aſſent to the propoſed articles. The chancellor (the earl of Leiceſter) was ſtrongly tinctured with Calviniſtic ſentiments; and ſir Francis Walſingham, the queen's ſecretary, was notoriouſly a partiſan of the Puritans. Hence ſectarian principles unavoidably gained ground; but notwithſtanding the univerſity rapidly roſe in conſequence, and could boaſt among its members numerous individuals eminent for their proficiency in almoſt every branch of the liberal arts or ſciences. Queen Elizabeth twice viſited the univerſity, and on one of theſe occaſions delivered a Latin ſpeech, extempore, with ſo much eaſe and correctneſs, as excited the ſurpriſe of all who heard her. (See Nichols' Account of "Queen Elizabeth's Progreſſes.") In this reign ſir Thomas Bodley founded the Bodleian library, which has proved an highly uſeful and valuable addition to the univerſity.

The reign of James I. is remarkable in the annals of the univerſity for the privilege it then acquired of ſending two repreſentatives to the national council. In this era, the diſputes between the Papiſts, Epiſcopalians, and Puritans, were carried to a great height, and proved highly injurious to the intereſts of ſolid learning, by inducing too eager a thirſt for controverſial inquiry. On this account ſir Henry Savile informs us, "that geometry was almoſt totally unknown and abandoned;" and hence we may fairly preſume that many of the other ſciences were in a ſimilar ſtate of decay and neglect.

Charles I., in the early part of his reign, conferred ſome important benefits on the univerſity. At the interceſſion of the chancellor, the celebrated archbiſhop Laud, he granted to it a new charter, in which its ancient liberties and privileges were explained and confirmed; and new ones were added. This charter was ſealed with the great ſeal of England, and to diſtinguiſh it from other grants, it was denominated the *Caroline charter*. In 1636, the ſtatutes of the univerſity, after being corrected and enlarged, and approved of by the heads of the colleges, received the royal ſanction; and in 1638 the ſtatute, ordering the examination of all candidates for degrees, was firſt put in execution. During the rebellion, which broke out ſhortly after, the univerſity maintained an inviolable allegiance to the unfortunate monarch; and even when the parliament maſtered the kingdom, and commiſſioners were deputed to reform the diſcipline, and correct the erroneous doctrines of the univerſity by the rule of covenant, the great majority of its members met in convocation, and paſſed a public act and declaration againſt the proffered opinions. "An act," obſerves lord Clarendon, "which muſt remain to the world's end, as a monument of the learning, courage, and loyalty of this excellent place."

But the firmneſs of the univerſity was of little avail in checking the religious fanaticiſm which at this period poſſeſſed the minds of the predominant party. The dean and chapter's lands were ſold; the Epiſcopalian divines were ejected; the libraries were pillaged; and ſome of the more zealous votaries even proceeded ſo far as to deſtroy the ornaments and decorations of the ſeveral colleges, without regard to the circumſtance whether they bore relation to matters of religion, or not. Claſſical learning now experienced a total ſtagnation. The candidates for holy orders were no longer required to be men of ſcience and polite erudition: it was enough if they "abounded in grace," and were "endowed with the ſpirit of preaching." Still, amidſt this melancholy ſcene of religious bigotry, a few men of real talent inhabited the more ſhady receſſes of the univerſity, and kept alive the dying embers of genuine knowledge. Theſe individuals met together at ſtated periods, to communicate to each other their reſpective diſcoveries in phyſics and geometry; and thus laid the foundation of the Royal Society, the moſt honourable and ſcientific inſtitution of which our country can boaſt. Cromwell, who was elected chancellor of Oxford in 1650, gave ſeveral proofs of his predilection for learning, but the temper of the times is ſuppoſed to have checked his efforts for its revival and encouragement. On the reſtoration, however, this ſentiment being in a great meaſure removed, the univerſity was again replaced on its former baſis. The lands of the dean and chapter were reſtored, and moſt of the perſons who had ſuffered expulſion on account of their principles, were reinſtated in their reſpective collegiate ſtations. Learning once more began to flouriſh, and ſome of thoſe who were the proudeſt boaſts of ſcience and of literature matured their ſtudies, or laid the foundation of their future eminence here, in the reign of the ſecond Charles.

But this pleaſing aſpect of affairs did not continue long; violent party contentions diſturbed the peace of the univerſity

ſity during the whole reign of James II., who exhibited a ſignal proof of his determination to ſubvert the civil and religious liberties of the country, in his conduct towards Magdalen college. It happened that ſhortly after he had aſcended the throne, the preſident of that eſtabliſhment died; and the king tranſmitted an order for the election of a perſon named Farmer as ſucceſſor in that office. The fellows, however, knowing that this Farmer was a man of contemptible character, petitioned his majeſty either to leave them the freedom of choice which their ſtatutes entitled them to aſſume, or to propoſe a more reſpectable individual for their head. James took no notice of this application, ſo that when the day of election arrived, the fellows elected Dr. Hough for preſident. This meaſure rouſed the vengeance of the monarch, who ſent down an inferior eccleſiaſtical commiſſion, the perſons entruſted with which conſented to withdraw Farmer, upon condition that Parker, then lately created biſhop of Oxford, ſhould be choſen in his ſtead. But this prelate being likewiſe a man of low character, and ſtrongly inclined to popery, the collegiates firmly adhered to their original election, and urged the tenor of their ſtatutes in defence of their reſolution. Their arguments, however, had little weight with the king, who viewed their refuſal to obey his mandate as an act bordering on rebellion. He therefore repaired to Oxford in perſon, and commanded the fellows to appear before him at Chriſt-church; but finding that even his own preſence could not influence their deciſion, he expelled the whole of them, except two, from the college. This conduct of the monarch excited the deteſtation of all friends to cool reaſon and upright government; and in 1688, when James became alarmed by the preparations of the prince of Orange to invade his dominions, one of the firſt meaſures he adopted to conciliate his ſubjects, was the re-inſtatement of the expelled members of Magdalen college.

From the period of the revolution to the preſent day, the univerſity of Oxford has continued to flouriſh in an unexampled degree. Its revenues have been increaſed, and the ſyſtem of education has generally kept pace with the improvements which have happily been accompliſhed in almoſt every branch of human ſcience. The doctrines of the ſchools, indeed, were received and taught here for ſome time after they had been exploded in the northern univerſities, but they have now yielded, as in other ſeminaries, to the more rational views of the experimental philoſophy. For ſome remarks on the ſtate of national learning during the laſt century, and the peculiar features of univerſity tuition, diſcipline, and influence, ſee UNIVERSITY.

*Preſent State of the Univerſity, its Officers, &c.*—The univerſity, as a corporate body, has been governed by ſtatutes enacted at different periods, and ſanctioned by charters granted in different reigns. Thoſe at preſent in force were chiefly drawn up in 1620, and were confirmed, as already mentioned, by king Charles I. in the year 1635. In that charter the corporation is ſtyled "The Chancellor, Maſters, and Scholars of the Univerſity of Oxford," and this body is veſted with the power of framing laws for its own government.

The principal officers of the univerſity are, the chancellor; the high ſteward; the vice chancellor; two proctors; a public orator; a keeper of the archives; a regiſtrar; numerous public lecturers and profeſſors; two curators of the theatre; two clerks of the market; the Bodleian librarian, and the keeper of the Aſhmolean muſeum. The firſt five mentioned officers are inveſted with magiſterial authority, and have the power of appointing deputies.

The *Chancellor* is choſen by the members of convocation, and now holds his office for life, though formerly it was annual, or at moſt triennial. It is a ſtation of great dignity, and is uſually filled by a perſon of the firſt eminence in the kingdom. The duties of the chancellor are to ſuperintend the intereſts of the univerſity, to defend its privileges, and to decide, either in perſon, or by deputy, in all civil queſtions in which a member happens to be involved. For this purpoſe he is empowered to hold regular courts; he likewiſe preſides, if preſent, at all univerſity meetings, and poſſeſſes an abſolute negative on their proceedings. The preſent chancellor is the right honourable lord Grenville, who was elected in the year 1809.

The *High-Steward* is nominated by the chancellor, but muſt be approved of by convocation. He holds his office for life, and is bound to aſſiſt the chancellor, vice-chancellor, and proctors, in the execution of their ſeveral duties, and to ſit in judgment in capital cauſes, where a member of the univerſity, or a privileged perſon, is the party offending. He likewiſe holds the univerſity court-leet either in perſon or by deputy. Lord Eldon, lord high chancellor of Great Britain, the preſent high ſteward, was elected in 1801.

The *Vice-Chancellor*, who is always the head of ſome college, is appointed by the chancellor, and admitted, and ſworn, in convocation. This office is annual, but the ſame individual is uſually named for four ſucceſſive years. The vice-chancellor nominates four deputies, or pro-vice-chancellors, who muſt likewiſe be heads of colleges. His duties are to enforce the univerſity regulations, to call congregations, convocations, and courts, licenſe taverns, expel delinquents, &c. The preſent vice-chancellor is John Cole, D.D. rector of Exeter college, appointed in 1810.

The *Proctors* are maſters of arts of at leaſt four years ſtanding, and not more than ten from their regency. They are elected by the common ſuffrage of all doctors and maſters of arts in their reſpective colleges, according to a cycle ordained in the Caroline ſtatutes, and have each the right of appointing a deputy. Their buſineſs is to aſſiſt the vice-chancellor in convocations and congregations; to ſuperintend the ſcholaſtic exerciſes, to enforce the ſtatutes, and to preſerve the public peace. Their names in 1812, were Charles Wightwick, and Thomas Davies.

The *Public Orator* is choſen by convocation, and muſt either be a bachelor of civil law or a maſter of arts. He is the ſecretary, or organ of the univerſity, writes letters and addreſſes on public occaſions, and delivers the annual Crewian oration alternately with the profeſſor of poetry. He likewiſe preſents the honorary degree of M.A. to thoſe on whom it may be conferred. The Rev. Wm. Crowe is the preſent public orator.

The *Keeper of the Archives* is elected by convocation, and is entruſted with the care and arrangement of all records and charters belonging to the univerſity, and on certain occaſions is appointed to defend its rights and privileges. This office is now veſted in Whittington Landon, D.D. provoſt of Worceſter college.

The *Regiſtrar* attends all univerſity meetings, and regiſters all its acts; ſuch as diſpenſations, graces, &c.; takes copies of all letters ſent or received, and collects the univerſity rents. This officer muſt be M.A. or B.C.L. and notary public. The Rev. John Gutch, M.A. the continuator of Wood's hiſtory, &c. of Oxford, has long held this reſpectable office.

The *Profeſſors* and *Lecturers* are public officers, who have certain ſalaries allowed to them, on ſome foundation, and who are, in conſequence, required to deliver lectures annually, on ſuch ſubjects as the founders may have appointed in their charters, or wills. The lectureſhips at preſent in Oxford are twenty-five in number, and are as follows.

The

The Regius profeſſorſhips of divinity, civil law, medicine, Hebrew, and Greek, founded, about the year 1535, by Henry VIII. and endowed by him with a yearly revenue of 40*l.* each, which has ſince been augmented by additional endowments.

The Margaret profeſſorſhip of divinity, founded by Margaret, counteſs of Richmond, mother of Henry VII., in 1497.

The profeſſorſhip of natural philoſophy, founded by the executors of ſir William Sedley, of Aylesford, in Kent, who left 20,000*l.* by will, for that purpoſe.

The Savilian profeſſorſhips of geometry and aſtronomy, founded, in 1619, by ſir Henry Savile, knt. Theſe profeſſorſhips are open to men of every nation.

The Camden profeſſorſhip of ancient hiſtory, founded by William Camden, Clarencieux king at Arms, in 1622. It is ſingular that our valuable chorographer did not inſtitute a profeſſorſhip of topography or antiquities.

The anatomical lecture, founded by Richard Tomlins, A.D. 1623, is annexed to the Regius profeſſorſhip of medicine.

The profeſſorſhip of muſic, founded in 1626, by William Heather, Muſ. Doct.

The Laudian profeſſorſhip of Arabic, founded and endowed by archbiſhop Laud, in 1636.

The profeſſorſhips of botany, one of which was founded by D. W. Sherard in 1728, and the other by his preſent majeſty, in 1793. The botanic garden was founded by the carl of Danby, in 1632.

The profeſſorſhip of poetry, founded by Dr. Henry Birkhead, in 1708.

The Regius profeſſorſhip of modern hiſtory and modern languages, founded by George I. in 1724.

The Anglo-Saxon profeſſorſhip, founded by Richard Rawlinſon, LL.D. in 1750, though the endowment did not take effect till 1795, as ordered by his will, dated June 2, 1752.

The Vinerian profeſſorſhip of common law, founded, in 1758, by the univerſity, in conformity to the will of Charles Viner, eſq. who bequeathed 12,000*l.* for that purpoſe. The celebrated ſir William Blackſtone was the firſt profeſſor on this foundation, and gave it high diſtinction by his admirable "Commentaries," which were firſt read here, and have ſince paſſed through ſeveral editions.

The Clinical profeſſorſhip, founded in 1772, with funds left by the earl of Lichfield, then chancellor of the univerſity. The lectures are delivered in the Radcliffe infirmary.

The lord almoner's reader, who is paid out of the almonry bounty.

The Aldrichian profeſſorſhip of anatomy, of the practice of medicine, and of chemiſtry, founded in 1803, under the will of Dr. Aldrich. The firſt is annexed to the prælectorſhip of anatomy.

The Bampton lectures on certain ſubjects in divinity, founded by John Bampton, M. A., canon of Saliſbury, in 1780. The office is annual, and the ſame perſon cannot officiate twice.

The *Curators of the Theatre* are two officers appointed by convocation to take charge of the building ſo called, in which the public meetings of the univerſity are held on great occaſions.

The *Clerks of the Markets* were inſtituted for the better care and government of the market. Their duty is to regulate the aſſiſe of bread, to obſerve the weights and meaſures, the prices and quality of proviſion, and to fine foreſtallers, regraters, &c.

The *Bodleian Librarian* is elected by convocation, and the office muſt be ſupplied within three days after it has become vacant, except during the long vacation, when three weeks are allowed. The Rev. John Price has inherited this office for 44 years.

The *Keeper of the Aſhmolean Muſeum* is appointed by the viſitors of that curious repoſitory. This office was endowed with a ſalary by Dr. Rawlinſon, with the ſingular reſtrictions, "that the keeper ſhould be a layman, of the degree of M.A. or B.C.L. only, unmarried, and neither F.R.S., nor F.S.A."

The whole buſineſs of the univerſity, in its corporate capacity, is conducted in two ſeparate aſſemblies, called the "Houſe of Congregation," and the "Houſe of Convocation."

The *Houſe of Congregation* is conſtituted entirely of regents; either of neceſſary regents, or regents *ad placitum*. Of theſe, nine at leaſt, beſides the vice-chancellor and proctors, are required to make a congregation. The buſineſs of this aſſembly refers chiefly to the paſſing of graces and diſpenſations, and to the granting of degrees. All votes are given ſecretly, by whiſper in the ear of the proctor; and in the inſtance of ſupplicating for graces, every member has a ſuſpending negative in three ſucceſſive congregations.

The *Houſe of Convocation*, which is compoſed of regents and non-regents alike, but with certain limitations, is privileged to inveſtigate and determine every ſubject, in which the intereſt of the univerſity is concerned. In this aſſembly, laws are enacted, altered, or explained, without reſtriction, unleſs the ſtatute propoſed to be altered be a Caroline ſtatute, and then the royal conſent muſt be previouſly obtained. In both theſe meetings, the chancellor or vice-chancellor ſingly, and the two proctors jointly, are officially empowered to negative every proceeding. All queſtions are decided by a majority of votes; and all elections, except for members of parliament, are conducted by a private ſcrutiny in writing.

The *Hebdomadal Meeting* is a ſort of committee or council to both houſes, and conſiſts of the vice-chancellor, heads of colleges and halls, and proctors, who are empowered to deliberate on all matters relating to the privileges, ſtatutes, and cuſtoms of the univerſity, and report on them in convocation, or congregation.

The ſeveral *degrees* conferred by the univerſity of Oxford are thoſe of doctors of divinity, civil law, medicine, and muſic; of bachelors in theſe ſciences, and of maſters and bachelors of arts. For the attainment of each of theſe degrees, a reſidence for a certain number of terms is required. See DEGREE.

*Colleges and Halls.*—Having thus given a general view of the univerſity and of its officers, we proceed to notice its ſeveral foundations ſeparately. Of theſe, twenty are diſtinct, endowed corporations, and are termed colleges; and five are halls, or buildings appropriated for the reſidence of ſtudents, under the ſuperintendence of a principal, who receives rent for their chambers. The following is a liſt of theſe inſtitutions, according to the date of their reſpective charters of foundation.

*Colleges.*

| | | |
|---|---|---|
| 1. | Merton College, founded | A.D. 1264 |
| 2. | Univerſity College | 1280 |
| 3. | Balliol College | 1281 |
| 4. | Exeter College | 1314 |
| 5. | Oriel College | 1326 |
| 6. | Queen's College | 1340 |

7. New

| | | |
|---|---|---|
| 7. | New College, founded | A.D. 1386 |
| 8. | Lincoln College | 1427 |
| 9. | All-Souls College | 1437 |
| 10. | Magdalen College | 1456 |
| 11. | The King's Hall and College of Brafen-Nofe | 1509 |
| 12. | Corpus Chriſti College | 1516 |
| 13. | Chriſt-Church | 1525 |
| 14. | Trinity College | 1554 |
| 15. | St. John's College | 1557 |
| 16. | Jeſus College | 1571 |
| 17. | Wadham College | 1613 |
| 18. | Pembroke College | 1620 |
| 19. | Worceſter College | 1714 |
| 20. | Hertford College | 1740 |

*Halls.*

| | | |
|---|---|---|
| 1. | St. Alban's Hall, about | 1200 |
| 2. | Edmund Hall | 1317 |
| 3. | St. Mary's Hall | 1325 |
| 4. | New Inn Hall | 1391 |
| 5. | St. Mary Magdalen Hall | 1480 |

*Merton College*, which is the oldeſt in point of legal eſtabliſhment in the univerſity, was founded by Walter de Merton, biſhop of Rocheſter, and lord chancellor of England, who began to erect the buildings about the year 1260, and eſtabliſhed the college by charter, dated January 7, 1264, under the appellation of "Domus Scholiarum de Merton." A ſecond charter was granted in 1270, and a third in 1274; both confirming the original deed, and adding new privileges and poſſeſſions to thoſe previouſly conferred. The firſt officers of this college were nominated in 1276, about two years after the completion of the buildings. Its chief benefactors, beſides the founder, were Ella, counteſs of Warwick, about the year 1295; John Willyott, chancellor of Exeter, in 1380; Dr. Thomas Jeſſop, phyſician, in 1595; William Rede, biſhop of Chicheſter; and ſir Thomas Bodley. This college is ſituated in St. John's ſtreet, to the eaſt of Corpus Chriſti, and its buildings are arranged round three courts or quadrangles. The outer court to the ſtreet was rebuilt in 1589, with the exception of the tower and gate-houſe, which were conſtructed in the early part of the 15th century, in the wardenſhip of Thomas Rodburne, biſhop of St. David's, and one of the moſt diſtinguiſhed mathematicians of his age. Within this court are the warden's lodgings, ſome portions of which are ſuppoſed to be coeval with the original edifice. The ſecond or grand court is of modern date, and exhibits a mixed ſtyle of architecture: the centre elevation is adorned with four tiers of columns, or four orders of architecture; but the third or ſmall court is of ancient erection, and is ſuppoſed to have been entirely built about the ſame time with the library, which forms its ſouth and weſt ſides. This library was founded in 1376, by the biſhop of Chicheſter above mentioned, and is the oldeſt ſtructure, diſtinctly appropriated as ſuch, in the kingdom. In 1550, when the work of reformation was conducted, in ſome inſtances, with more zeal than judgment, many of the printed books and MSS. belonging to this inſtitution were either ſold or deſtroyed. Upon the reſtoration of the library, however, by ſir Thomas Bodley, a conſiderable part of them was recovered by the liberality of thoſe private individuals by whom they had been purchaſed. The hall of this college is remarkable, as having been the room in which queen Elizabeth was entertained at dinner, on the occaſion of her viſit to the univerſity, with her privy council, in 1592.

The number of ſtudents at Merton college has varied at different periods, and appears to have been regulated by the changes which occurred in its revenue. In 1612, the ſociety conſiſted of ninety-three members, but at preſent there are only forty-eight; a warden, twenty-four fellows, two chaplains, fourteen poſt-maſters, four ſcholars, and two clerks. The warden is choſen from among the fellows, who preſent a leet of three to the archbiſhop of Canterbury, by whom one of them is appointed to the office. The firſt common room, uſed in any college in Great Britain, was fitted up here in 1661. Among the more eminent members of Merton college were Duns Scotus, Wicliffe, ſir Henry Savile, Dr. Harvey, the diſcoverer of the circulation of the blood, the celebrated Druſius, and Robert Devereux, earl of Eſſex, the parliamentary general, whoſe character is ſo ingenuouſly drawn by lord Clarendon.

*Univerſity College*, as already noticed, is ſaid to have owed its origin to king Alfred. Smith, in his hiſtory of this college, has proved to the ſatisfaction of every unprejudiced mind, that it was founded by the univerſity, with the money of William of Durham, who died at Rouen in Normandy, in the year 1249, and bequeathed 310 marks to purchaſe certain annual rents for the maintenance of ten, eleven, twelve, or more maſters. At firſt, the funds left by this benefactor were appropriated to the ſupport of a limited number of individuals, (choſen from the various halls of the univerſity,) who did not form an independent ſociety, but were ſeverally ſubordinate to the ſchools in which they had been educated. In 1280, however, they were conſtituted a ſociety by themſelves, under certain conditions; and in 1292, their privileges were confirmed and enlarged by a body of ſtatutes. The ſituation of their houſe, or hall, at this period, is uncertain; but hiſtorians have generally placed it on part of the ſcite of Brazen-noſe college, and aſſert that they removed to the preſent college, in the High-ſtreet, about the year 1343. On this removal, they ſtyled themſelves the Maſters and Scholars of the Hall of the Univerſity of Oxford, and their houſe Univerſity-hall; but in 1381, the latter began to be called Great Univerſity-hall. When the term college was firſt applied is not aſcertained, nor is it known at what time the corporation was completed. This, however, moſt probably did not take place till about the year 1475, when the body of ſtatutes, ſtill in force, were enacted; but a common ſeal was uſed as early as the year 1320.

Numerous benefactors to this college appeared within the firſt century after its foundation; and in 1403 Walter Shirlaw, biſhop of Durham, gave the manor of Mark's-hall, in Eſſex, for the maintenance of three fellows, natives of York and Durham. Henry, earl of Northumberland, in 1442, gave lands and the advowſon of a rectory to ſupport three bachelors or maſters of arts from the dioceſes of Durham, Carliſle, and York. In 1566, Joan Davys, wife of a citizen of Oxford, gave certain eſtates for the eſtabliſhment of two logic lecturers, or one in logic and another in philoſophy; and for an augmentation of the allowance to the maſters and fellows. Francis Ruſſel, ſecond earl of Bedford, Robert Dudley, earl of Leiceſter, John Freyſton of Altofts in Yorkſhire, the Rev. Robert Gunſley, and ſir Simon Bennet, were likewiſe very conſiderable donors. But the greateſt benefactor of modern times was Dr. Radcliffe, who, beſides rendering munificent aſſiſtance toward improving the buildings of the college, inſtituted and endowed two travelling fellowſhips for ſtudents in medicine. Each fellow receives 300*l.* *per annum* for ten years, the firſt five of which he is required to ſpend abroad.

Univerſity college ſtands on the ſouth ſide of High-ſtreet, and conſiſts principally of two quadrangular courts, one of which

which was built at various times between the years 1634 and 1675. It is one hundred feet ſquare, with a chapel and hall on the ſouth ſide. The other court, which was chiefly erected by Dr. Radcliffe, has only three ſides, the fourth opening to the maſter's garden. Theſe two quadrangles form a grand front towards the ſtreet, of about 260 feet in length, with two tower gateways. The chapel of this college was built in 1665, and diſplays much painted glaſs in the windows. It alſo contains a cenotaph to the memory of ſir William Jones, the celebrated orientaliſt, which was deſigned and executed by John Flaxman, R.A., and is highly creditable to the talents of the artiſt. The bas-relief is ſurmounted by tigers' heads, and repreſents the lamented ſubject of the funeral trophy engaged in a digeſt of the Hindu code, with Brahmins in attendance. The library here was completed in 1669, and is furniſhed with a very valuable collection of books and MSS.

*Balliol college* owes its foundation to John de Balliol, of Bernard's caſtle, in the county of Durham, father to the unfortunate king of Scotland of the ſame name. This gentleman, who poſſeſſed a taſte for literature, and a benevolence of diſpoſition little prevalent in the thirteenth century, commenced it in the year 1263, and intended that it ſhould maintain ſixteen poor ſcholars of Oxford. He died, however, without having effected the deſign, and ſo ſuddenly that he left no will, but verbally enjoined his lady and executors to take charge of and give permanency to his infant inſtitution. Lady Dervorgille accordingly, at the inſtigation of her confeſſor Richard Slickbury, hired a houſe on the ſcite of the preſent college; and was ſo fortunate as to meet with the concurrence of the founder's executors in all her ſubſequent ſteps to perpetuate the eſtabliſhment. In 1282 ſhe appointed ſtatutes under her ſeal, which are intereſting, becauſe they ſerve to throw ſome light on the modes of collegiate diſcipline at that early period. In 1284 the lady Dervorgille purchaſed a tenement called Mary's-hall, and having repaired and enlarged it, transferred the ſcholars to this new reſidence, which was henceforth called New Balliol college. The ſame year ſhe preſented them with ſome lands in the county of Northumberland, and had their ſtatutes confirmed by Oliver, biſhop of Lincoln, and by her ſon John de Balliol, who at that time held the Scottiſh ſceptre under the protection of Edward I. But notwithſtanding theſe generous efforts, the revenues of the college ſtill continued extremely ſmall, not yielding above eight-pence *per* week to each ſcholar. A number of benefactors, however, ſoon aroſe, and by their united contributions conferred a conſiderable degree of opulence on the inſtitution. In 1294, Hugh de Wychenbroke gave the advowſon of St. Lawrence, Old-Jewry, London; and in 1310 Hugh de Warkenby, and William de Gotham, gave four meſſuages, in School-ſtreet, for the ſupport of a chaplain to officiate in the oratory. In 1320, Richard de Hunſinſore alſo gave a tenement in Oxford; but theſe donations were trivial compared with the liberal gifts of ſir William Fenton, and ſir Philip Somervyle. The benefaction of the latter, indeed, was deemed ſo conſiderable as to entitle him to the honours of a ſecond founder. A new body of ſtatutes was drawn out under his ſanction, one article of which enacted, that the ſociety ſhould henceforward be governed by a maſter. Theſe ſtatutes were confirmed by Edward Balliol, king of Scotland, and remained in force till 1364, when a third code was enacted by Simon de Sudbury, afterwards archbiſhop of Canterbury. In 1507 this code was likewiſe ſuperſeded, and the one at preſent in force ſubſtituted in its ſtead. Among the various benefactors ſince that period, the moſt diſtinguiſhed were Thomas Harrope, rector of Haſely; Peter Blundell of Tiverton in Devonſhire; lady Elizabeth Periam of Greenland, in Berkſhire, ſiſter to the great lord Bacon; Dr. John Warner, biſhop of Rocheſter; and John Snell of Warwickſhire. The two laſt gave donations excluſively for the benefit of Scotch ſcholars.

As in Merton college, the members of this ſociety have varied in number at different periods, according to the ſtate of its finances. In 1612 the ſociety conſiſted of one hundred and twenty-ſeven perſons, but at preſent the number is reduced to a maſter, twelve fellows, fourteen ſcholars, and eighteen exhibitioners. The viſitor is elected by the college, which is the only one in the univerſity that enjoys a like privilege. John Wieliffe, the celebrated reformer, was one of the maſters of this college.

The buildings of Balliol college were erected at various times on the ſcite of the tenements or halls hired and purchaſed by the lady Dervorgille, and are chiefly arranged round a quadrangle, which is 120 feet long and 80 broad, in the interior. The front towards the ſtreet preſents much irregularity of ſtructure. Over the entrance, in the centre, is a fine ſquare tower, embattled at the top, with an oriel window in front, alſo a highly enriched and canopied niche on each ſide. This gateway is likewiſe adorned with the arms of Balliol. The buildings to the eaſt and weſt of the tower were conſtructed at the beginning of the laſt century, and poſſeſs little conſonance of character with the older portions of the college. Within the court the ſame diſſimilarity of architecture is viſible as on the outſide. The hall, and the reſidence of the maſter, occupy its weſtern ſide; the northern ſide is compoſed of the chapel and library, and the other ſides are appropriated as lodgings for the fellows and ſcholars. The library was built in two parts, that towards the weſt by Dr. Chace, A.D. 1427, and that on the eaſt by Robert Abdy in 1477. The interior of the whole has been lately renewed under the ſuperintendence of James Wyatt, architect. Formerly this library was eſteemed among the firſt in the univerſity. Before the time of Edward VI. it was particularly rich in MSS., above two hundred of which, highly illuminated, were preſented by Grey, biſhop of Ely, in 1454. Moſt of theſe, however, have been ſince loſt or deſtroyed, but the collection of printed books is ſtill both valuable and extenſive.

Beſides the quadrangle, there is an area on the north-weſt, conſiſting of ſeveral detached lodgings for the ſtudents. Theſe were purchaſed and made over to the ſociety by archbiſhop Abbot. There is likewiſe a building belonging to the college, at the ſouth-weſt angle of the quadrangle fronting the ſtreet. It was erected at the expence of Mr. Fiſher, late fellow of Balliol.

*Exeter college* was founded in the year 1315, by Walter de Stapleton, biſhop of Exeter, who was likewiſe the founder of Hert or Hart hall, now Hertford college, the origin of which is ſo intimately blended with that of Exeter college, that it is difficult, at leaſt for ſome time, to conſider them as ſeparate eſtabliſhments. The rector and ſcholars of Hart hall, indeed, were actually the firſt poſſeſſors of this college, having been removed to the buildings which formerly occupied the preſent ſcite, and others dependent on them ſubſtituted in their ſtead. According to the ſtatutes then formed, the ſociety was to conſiſt of thirteen members, eight of whom were to be choſen from Devonſhire, four from Cornwall, and one, a prieſt, nominated by the dean and chapter of Exeter, from any part of the kingdom. The chief benefactors of this inſtitution were Edmund Stafford, biſhop of Exeter, who added two fellowſhips, and reformed the ſtatutes in 1404; and ſir William Petre, who procured a new body of ſtatutes, and a regular deed of incorporation



for

for the college in 1565. The ſame gentleman likewiſe endowed eight new fellowſhips. The other conſiderable contributors to the proſperity of this eſtabliſhment, were ſir John Ackland; king Charles I.; ſir John Maynard; Samuel Hill, rector of Warlegan; and the lady Shiers. In 1612, the ſociety of Exeter college conſiſted of 206 perſons. The preſent members are a rector, twenty-five fellows, one ſcholar, who is bible clerk, and ten exhibitioners, beſides other ſtudents. The biſhop of Exeter is viſitor.

The buildings of this college encompaſs a ſingle quadrangle. The grand entrance facing the ſtreet is ſurmounted by a tower with Ionic pilaſters, which ſupports a ſemicircular pediment, ornamented with the arms of the founder on a ſhield ſurrounded with feſtoons. The inner front is of ſimilar conſtruction; but the arms here are thoſe of lord Petre. More uniformity prevails in the architecture of this college than in any of thoſe hitherto noticed; and, on the whole, its appearance is ſimple and pleaſing. The chapel, which occupies a large portion of one ſide, is a neat and ſolid edifice in the later pointed ſtyle, and poſſeſſes the peculiarity of having two aiſles. The hall is a handſome building, alſo in the pointed ſtyle, erected by ſir John Ackland about the year 1620; but the library is of modern erection, and contains, among other valuable works, a fine collection of Aldine claſſics.

*Oriel College* was founded, about the year 1324, by Adam de Brom, rector of St. Mary's in Oxford, under the ſanction of Edward II., to whom he afterwards ſurrendered the whole, in the hope of obtaining the royal protection for his infant eſtabliſhment. Nor were his expectations groundleſs, for the king readily took the college under his eſpecial care, and the next year granted a new charter, appointing it a college for divinity and the canon law, to be governed by a provoſt. He likewiſe beſtowed upon the ſociety ſome tenements in Oxford, and the advowſon of St. Mary's church, on condition of their providing chaplains for the daily ſervice. Adam de Brom was named the firſt provoſt, and drew up a code of ſtatutes in 1326, by which the college was to conſiſt of a provoſt, ten fellows or ſcholars, ſeven to ſtudy divinity, and three the canon law. He likewiſe gave them the livings of Aberforth in Yorkſhire, and Coleby in Lincolnſhire; and in 1327 Edward III. beſtowed upon them a large meſſuage called La Oriole, or Oriel, to which the members ſoon after removed; and hence the college derived its preſent name. The chief ſubſequent benefactors of this inſtitution were John Franke, lord chancellor of England in 1441; Carpenter, biſhop of Worceſter; Smyth, biſhop of Lincoln; Dr. Richard Dudley, chancellor of Sarum; Dr. Robinſon, biſhop of London; Dr. Carter, provoſt of the college in 1708; Charles, fourth duke of Beaufort, and her majeſty queen Anne. By ſome of theſe benefactors fellowſhips were founded, ſo that the ſociety now conſiſts of a provoſt, eighteen fellows, fifteen exhibitioners, and other ſtudents. The lord chancellor is the viſitor.

The buildings conſiſt of a large quadrangle, and two lateral ranges of chambers for the reception of ſtudents, with a library between. The whole of the quadrangle was rebuilt in the early part of the 17th century, and both exteriorly and interiorly poſſeſſes uniformity of ſtyle and conſtruction. The front, towards the ſtreet, is divided by a ſquare tower, which riſes over the entrance, and is ornamented with a bay window or oriel. The hall faces the gateway, and is approached by a flight of ſteps under a portico, ſurmounted by ſtatues of Edward II. and III. in niches, with the virgin and child in another niche, immediately above. The provoſt's lodgings are on the north ſide; and the buildings on the ſouth and weſt are entirely appropriated for the accommodation of ſtudents. The library was deſigned by James Wyatt, eſq. architect, and executed under his direction. It contains, among many other books, a very curious and valuable collection, which was bequeathed to the ſociety by Edward, lord Leigh of Stourleigh.

*Queen's College* was founded by Robert Eglesfeld, confeſſor to queen Philippa, the illuſtrious conſort of Edward III. The founder was deſcended from an honourable family in the county of Cumberland, and appears to have been deſervedly held in high eſtimation by his royal maſter and miſtreſs, as he employed his intereſt at court chiefly in promoting religion and learning. Anxious to ſupply the means of education to the border counties, in which, to uſe his own expreſſions, "an unuſual ſcarcity of literature prevailed," he purchaſed ſome tenements on or near the ſcite of the preſent buildings, and obtained a charter, dated January 18, 1340, from Edward III., to conſtitute a collegiate hall under the name of "Aula Scholarium Reginæ de Oxon." a title which ſeems to imply that the queen had ſome ſhare in its inſtitution. At all events, ſhe took it immediately after under her protection, and, in conſequence, the honorary patronage of the college has ever ſince appertained to the queens of England. By the original charter and ſtatutes of this eſtabliſhment, the ſociety was to conſiſt of a provoſt and twelve fellows or ſcholars; the provoſt to be in holy orders, and choſen from among the fellows, who were to be natives of Cumberland and Weſtmorland, in the firſt inſtance; and afterwards of thoſe counties in which the college poſſeſſed property. This number, however, has ſince been increaſed by various benefactions, but by none ſo much as by that of John Michel, eſq. of Richmond, who bequeathed to Queen's college eſtates valued at 700*l.* a-year, for the maintenance of eight maſter fellows, four bachelor ſcholars, and four under-graduate ſcholars, or exhibitioners; and for the erection of ſuitable buildings for the accommodation of the maſters and ſcholars; ſo that this has been conſidered in the light of a new foundation. The queens who have contributed to the college, beſides queen Philippa, are Henrietta Maria, conſort to Charles I., the late queen Caroline, and her preſent majeſty. The firſt gave three rectories and as many vicarages, and the two laſt preſented 1000*l.* each towards enlarging and repairing the buildings, which now conſiſt of two courts, divided by the hall and chapel, and forming an oblong 300 feet long and 220 broad. With the exception of the chapel, the whole of this college was erected during the laſt century. The ſtyle of its architecture is, therefore, modern. The principal front is in the High-ſtreet, and has in the centre a large gateway, over which is a ſtatue of queen Caroline, under a cupola ſupported by pillars. This gateway leads into the firſt court, which bears, in general, a remarkable reſemblance to the Luxembourg palace at Paris. It was executed by Hawkſmoor, from a deſign either by ſir Chriſtopher Wren, or by Dr. Lancaſter. The principal library-room is one of the largeſt in the univerſity, and is arranged in a very taſteful manner. Here are two very ancient paintings on glaſs of Henry V., who received his education at this college.

*New College* is indebted for its origin to William de Wykeham, biſhop of Wincheſter, one of the moſt illuſtrious characters of his age. This prelate was born in 1324, and roſe through ſucceſſive gradations to the higheſt offices of the ſtate, and to the greateſt influence in the church. (See WYKEHAM). He originally founded the ſociety of New college about the year 1373, and eſtabliſhed the members in halls, which he hired for their reception, till a college could

be erected. Of this college he laid the foundation-ſtone in 1380, under the authority of the king's licence, and likewiſe of the pope's bull; but the buildings were not completed for a period of ſix years. As ſoon as they were, however, the ſociety was removed into them, and took poſſeſſion with great ſolemnity. The ſame year, biſhop Wykeham began his collegiate eſtabliſhment at Wincheſter, which was to ſerve as a nurſery to that of Oxford, ſo grand and comprehenſive was the original deſign of this diſtinguiſhed benefactor. Both ſocieties, by their reſpective charters and ſtatutes, were made to conſiſt of a warden and ſeventy ſcholars, beſides prieſts, clerks, and choriſters, for the ſervice of the chapels. That of Wincheſter had likewiſe a ſchoolmaſter and uſher, and was to ſupply ſtudents to the Oxford college, by election, and to ſubmit to an annual viſitation from the warden and two fellows of the latter. Many ſpecial privileges were at this time ſecured to New college, of which one was, that the fellows ſhould be admitted to all degrees in the univerſity, upon being found qualified by examinations conducted, according to form, in their own college. This right was queſtioned in 1608, but decided by the then chancellor, archbiſhop Bancroft, in favour of Wykeham's foundation.

Many benefactors have contributed to augment the proſperity of this college beſides the founder, but only one appeared during his life-time. This was John de Buckingham, biſhop of Lincoln, who preſented to the ſociety the advowſon of Swalcliffe church, together with ſome adjacent lands. Of the ſubſequent donors, the principal were Thomas Beckington, biſhop of Bath; Robert Shireburn, biſhop of Chicheſter; John Smyth, a burgher of Ipſwich; Dr. Fleſhmonger, dean of Chicheſter; and Chriſtopher Rawlins, vicar of Alderbury in 1589. By the aſſiſtance of theſe, and numerous ſmaller benefactions, this ſociety became one of the richeſt in Oxford, its yearly revenues being reckoned at 1000*l.* in 1592, when it conſiſted of one hundred and thirty perſons. The preſent members are a warden, ſeventy fellows, ten chaplains, three clerks, a ſexton, and ſixteen choriſters. The whole of the fellows muſt be elected from Wincheſter, at a regular meeting for that purpoſe, which is attended by the wardens of both colleges, two fellows of New college, and the ſubwarden and head maſter of Wincheſter. The viſitor of New college is the biſhop of Wincheſter. In the original charter of foundation, this college is entitled "Seinte Marie College of Wyncheſtre;" but having popularly received the name of New college at the time of its erection, it has, by a remarkable inattention to propriety, retained that appellation through every ſucceeding age.

The buildings of this college are extenſive, diverſified, and intereſting. As originally projected by the founder, they conſiſted of a ſpacious quadrangle, including the chapel, hall and library, with a ſmall quadrangle adjoining, called the cloiſters. The other buildings which form the garden court conſtitute an addition to the original deſign, and were built in 1684, in imitation either of the palace of Verſailles, or of the king's houſe at Wincheſter. The approach to the great quadrangle is by a portal, with a tower above, which ſtill retains the ſculptured effigy of Wykeham in one of its ornamented niches. The chapel and hall on the north ſide of the great court preſent as fine an elevation as any in the univerſity. The former is peculiarly beautiful and chaſte in its interior decorations. The choir of this ſtructure is 100 feet long, 35 broad, and 65 high; and the anti-chapel, running at right angles into the choir, meaſures about 80 feet in length by 36 in breadth. The windows of the latter diviſion afford a magnificent diſplay of painted glaſs, in four different ſtyles of execution. None of them, however, come near, either with reſpect to deſign or beauty of colouring, to the great weſt window, which probably equals any ſimilar effort in the pictorial art in Great Britain. It was executed by Jervais from finiſhed cartoons by ſir Joſhua Reynolds, and is divided into two parts, the higher repreſenting the Nativity, and the lower ſeven figures emblematic of the Chriſtian and cardinal virtues. The famous crozier of the founder is preſerved in this chapel: and over the altar table are ſome beautiful ſpecimens of ſculpture from the chiſſel of Richard Weſtmacott, eſq. R.A.

*Lincoln College.*—The original inſtitution of this college took place in 1427, when Richard Flemming, biſhop of Lincoln, obtained the royal licence to eſtabliſh a ſociety of one rector or warden, ſeven fellows, and two chaplains in the church of All-Saints, Oxford, and to unite to that church thoſe of St. Mildred and St. Michael, under the general name of the firſt. This ſociety he appointed perpetual parſons of the collegiate church, and intended to have erected buildings for the reception of its members, but was prevented by death from executing his benevolent views. They continued to reſide, therefore, in a tenement called Deep-hall, till the original deſign of the preſent college was completed by the munificent exertions of biſhop Rotheram, who was afterwards archbiſhop of York. This prelate likewiſe increaſed the number of fellows from ſeven to twelve, and framed a body of ſtatutes for the government of the ſociety. Various other benefactors have ariſen ſince that period, among whom biſhop Smyth, the founder of Brazen-Noſe, Edward Darby, M.A. archdeacon of Stow, and Nathaniel, lord Crew, biſhop of Durham, were the principal; the ſociety now conſiſts of a rector, twelve fellows, eight ſcholars, twelve exhibitioners, and a bible clerk. The biſhop of Lincoln is viſitor.

The chief buildings of this college compoſe two quadrangular courts. The firſt court, began ſoon after the founder's death, and finiſhed by biſhop Rotheram, ſtill retains much of the character of ancient collegiate ſtructures. It contains the hall, the library, the rector's lodgings, the common room, and ſome apartments for ſcholars, all of which are of low elevation, and arranged with great ſimplicity. The other quadrangle was erected about the year 1612, with the exception of ſix ſets of rooms, which were added in 1759. The chief ornament of this court is the chapel, built at the expence of Dr. John Williams, biſhop of Lincoln.

*All-Souls College* was founded, in the year 1437, by Henry Chichele, archbiſhop of Canterbury, who prevailed on king Henry VI. to aſſume the title of co-founder. Chichele, however, retained all legiſlative power reſpecting the new eſtabliſhment, and drew up a code of ſtatutes, after the model of thoſe promulgated by biſhop Wykeham. By theſe ſtatutes, in conformity with the charter, the ſociety was made to conſiſt of a warden and twenty fellows, of whom ſixteen were to ſtudy the civil and canon laws, and the remainder philoſophy, and the arts, and divinity. Chaplains, clerks, and choriſters were likewiſe added for the ſervice of the chapel. Numerous benefactors have enriched this college at different periods, by whoſe conjunct donations the ſociety has been enabled to augment the number of its members to a warden, forty fellows, two chaplains, and ſix clerks and choriſters. The warden is elected in the ſame manner as the warden of Merton college. The archbiſhop of Canterbury is viſitor.

The buildings of this college conſtitute two large quadrangles, one of which is entered from High-ſtreet, and the other from Radcliffe-ſquare. The former was erected by the founder, and though in ſome parts modernized, ſtill preſerves

ſerves many features of the original ſtyle of its architecture. Two niches over the principal entrance contain large and well-ſculptured ſtatues of king Edward VI. and of Chichele. The latter quadrangle is comparatively of modern erection, and meaſures, within the court, 172 feet in length, and 155 in breadth. On the weſt are the grand entrance and the cloiſter; on the eaſt the common room and other apartments, with two handſome towers; on the ſouth the chapel and hall; and on the north the library. "This quadrangle," ſays Chalmers, "eſpecially when viewed from the weſt entrance, preſents one of the moſt attractive ſcenes of which Oxford can boaſt. The general ſtyle is the mixed Gothic." The library, which was begun in 1716, and only completed in 1756, owes its erection to the munificence of colonel Coddrington, who left 10,000*l.* for that purpoſe, beſides bequeathing to the ſociety a collection of books, then valued at upwards of 6000*l.* The principal room is probably the largeſt ſo appropriated in the kingdom, being 198 feet in length, and 32½ in breadth, excluſive of a grand central receſs, in the area of which is fixed a ſtatue of the colonel. Dr. Young, author of the Night Thoughts, laid the foundation ſtone of this ſtructure, which was deſigned by Hawkſmoor, and chiefly executed under his direction.

*Magdalen College* was founded by William of Waynflete, biſhop of Wincheſter, under the authority of a licence, dated July 18, 1457, for a preſident, forty fellows, thirty ſcholars called *demies*, a divinity lecturer, a ſchool-maſter, an uſher, four chaplains, an organiſt, eight clerks, and ſixteen choriſters. The fellows were directed to ſtudy divinity, medicine, and the canon law, and the demies to be "converſant in grammar, logic, ſophiſtry, and that ſpecies of muſic called plain ſong, or chaunting." Among the chief benefactors of this inſtitution were ſir John Faſtolf, who appointed the founder one of his executors, William, earl of Arundel, Ralph Freman, and John Norris, LL.D. by whoſe, and other donations, added to the endowments of Waynflete, the college became ſo opulent, that its annual revenues were eſtimated, in 1535, at 1076*l.* 5*s.* 2*d.* The members of this ſociety ſtill remain the ſame in number as at the time of foundation, with the addition only of gentlemen commoners, for no commoners are admitted. The biſhop of Wincheſter is viſitor.

The buildings of this college, as deſigned by the founder, compoſe two quadrangular courts, one of ſmall, and another of large dimenſions. The entrance to the firſt is through a modern portal of the Doric order, which appears very inappropriate, and very badly accords with the reſt of the ſtructure. This court contains the preſident's lodgings on the left, and in front is the entrance door-way to the chapel. This door-way is a very curious and beautiful ſpecimen of architecture. In niches over it are ſmall ſtatues of Waynflete, Henry VI., St. John the Baptiſt, and St. Mary Magdalen, ſtanding in canopies of exquiſite workmanſhip. The large quadrangle remains nearly in the ſame ſtate in which the founder left it, the ſouth cloiſter being the only portion of the buildings that has been added ſince his death. Here are the chapel, hall, and library, a part of the preſident's lodgings, and chambers for the fellows and demies. The chapel, a moſt elegant ſtructure, contains numerous monuments of perſons connected with the college, and has its windows highly ornamented with painted glaſs. Round the whole interior of this court is ranged a ſeries of large hieroglyphic figures, which have afforded matter of much enquiry among the Oxford topographers.

Beſides the two courts above-mentioned there are a tower, and ſeveral other ranges of buildings belonging to Magdalen college, which have been erected at different periods, and were not included in Waynflete's deſign. The tower is a ſtructure of very fine proportion, and is ſuppoſed to have been deſigned by the celebrated Wolſey, while he was burſar of this college. It was commenced in 1492, and finiſhed in 1498. A few years afterwards the chaplain's court was built; and ſome further rooms, towards the eaſt, were added in 1635. At the beginning of the laſt century, a plan was propoſed, and agreed to, for the building of a new quadrangle, but only one ſide of it has yet been finiſhed. By this plan, three ſides of the old quadrangle were to have been demoliſhed, leaving only the hall, chapel, and ſouth cloiſter.

Magdalen college being bound by its ſtatutes to entertain the kings of England and their ſons when at Oxford, the hall has frequently been the ſcene of royal and princely feſtivity. Edward IV., and Richard III., were both entertained here by the founder. In 1496, prince Arthur paid a viſit to this college, and in 1605 James I. held his court within its walls, upon which occaſion Henry, prince of Wales, was admitted a member of the ſociety. Oliver Cromwell, Fairfax, and other principal officers of the parliamentary army, alſo had a ſumptuous dinner provided for them here in 1649, and afterwards played at bowls in the college green, which, with the grove and water walk, form pleaſure-grounds of great extent and beauty.

*Brazen-Noſe College.*—This noble inſtitution was founded by William Smyth, biſhop of Lincoln, in concert with his friend ſir Richard Sutton. The buildings were began about the year 1509, and ſhortly after the ſociety was formed and accommodated in ſome of the ancient premiſes, which occupied the ſite of the preſent college, and moſt probably in the tenement called Brazen-Noſe hall, whence the new foundation derived its name. By the charter of incorporation, which is dated 15th of January, 1511-12, this ſociety was to conſiſt of a principal and ſixty ſcholars; but in 1621, a reviſion of the ſtatutes having been made by the ſurviving founder, ſir Robert Sutton, the members were limited to a principal and twelve fellows. They were ſoon, however, augmented by the munificence of ſucceeding benefactors, ſome of whom added fellowſhips, others ſcholarſhips and exhibitions, others lectureſhips in philoſophy, in humanity, Hebrew, Greek, and mathematics. Theſe laſt were founded by ſir John Port, John Barneſton, D.D., Richard Harper, a judge of the common pleas, and Thomas Weſton, rector of Criſſelton, near Cheſter. The other contributors are too numerous to be mentioned; ſo that we ſhall only obſerve, that by their conjunct donations, the ſociety now conſiſts of a principal, twenty fellows, thirty-two ſcholars, and fifteen exhibitioners, beſides a great number of independent members. The biſhop of Lincoln is viſitor.

The buildings of this college are arranged round a large quadrangle and a ſmaller court to the ſouth, with the exception of the reſidence of the principal, and lodgings for ſeven ſtudents, which are detached. The large quadrangle contains the hall and chambers for the ſociety; and has ſuffered little alteration ſince it was originally built, except the addition of a continued attic. The front is an extenſive range, forming the weſt ſide of Radcliffe-ſquare, with a ſquare tower in the centre decorated with architectural ornaments. The ſmall court is occupied by the library and chapel, and was erected in the ſeventeenth century, from plans, as ſome aſſert, by ſir Chriſtopher Wren, while a very young man at college. The architecture is of the mixed kind; arched windows and battlements are here oppoſed by Grecian pilaſters and capitals.

*Corpus Chriſti College* was founded and endowed by Richard Fox, biſhop of Wincheſter. This prelate had de-

ſigned and partly executed a collegiate eſtabliſhment for monks and ſecular ſcholars, to be ſubordinate to the priory of St. Swithin, in Wincheſter, but was induced to alter his plan, by the advice of Hugh Oldham, biſhop of Exeter, and to found a college for the ſtudy of divinity, philoſophy, and literature. He accordingly obtained a charter to that effect, dated March, 1516, and ſhortly after drew up a body of ſtatutes, declaring the ſociety to conſiſt of a preſident, twenty fellows, twenty ſcholars, two clerks and two choriſters. He likewiſe appointed two lectures for Greek and Latin, a meaſure which ſoon raiſed the reputation of the college to the higheſt pitch, as the founder conferred thoſe offices on men of eſtabliſhed fame and acknowledged erudition. The benefactors of this college are not ſo numerous as thoſe of ſome other colleges, but the donations were in general liberal, and the ample proviſion of the founder rendered additional contributions the leſs requiſite. Biſhop Oldham above-mentioned gave 6000 marks, beſides ſome eſtates in land, and Dr. Turner 6000*l.* The members of the college are the ſame as thoſe preſcribed by the charter, with the addition only of four exhibitioners and ſix gentlemen commoners. The biſhop of Wincheſter is viſitor.

Of the buildings of this college, the ſpacious quadrangle alone, with the chapel, hall, and library, was built by biſhop Fox. This court is entered by a gateway under a lofty ſquare tower in the centre of the principal front. On the caſt ſide is the hall, and on the ſouth the library, which laſt is decorated with a ſtatue of the founder in his pontifical robes. The rooms to the caſt of the quadrangle were firſt built in 1667, and re-erected in 1737, for the reſidence of the ſix gentlemen commoners. The fine building which looks into Chriſtchurch walks owed its conſtruction to Dr. Turner, and is appropriated for the reception of ſtudents. The library is enriched with an invaluable ſet of Aldine claſſics, and with numerous curious MSS. and rare works in a ſtate of excellent preſervation. The Aldine claſſics were collected by the founder.

*Chriſtchurch College* is indebted for its origin to the munificence of the celebrated cardinal Wolſey, who has been juſtly ſtyled the Mæcenas of his age. This prelate began the great work in queſtion in the year 1524, upon a ſcale far ſurpaſſing the deſign of any former or ſucceeding founder. By the original charter, which he procured from king Henry VIII., his projected eſtabliſhment was made to conſiſt of one hundred and ſixty perſons, who were to apply themſelves to the ſtudy of the ſciences at large, as well as to polite literature. For the ſupport of this ſociety he ſettled upon it a clear annual revenue of 2000*l.* and commenced the preſent ſtructure for the accommodation of its members, under the deſignation of "Cardinal College." Before he had completed his plans, however, he was hurled from the lofty pinnacle of power to which he had riſen, and plunged into irretrievable diſgrace: but before his death he warmly recommended his college to the foſtering regard of his monarch. Accordingly Henry, after the firſt effuſions of his reſentment had ſubſided, yielded to the entreatics of the ſociety in 1532, and became its patron. But in order to preclude Wolſey from all nominal participation in the merit of the undertaking, he granted the college a new charter of foundation, directed that its members ſhould conſiſt of a dean and twelve canons, and that it ſhould be called "King Henry VIIIth's College in Oxford." This arrangement, however, only continued for twelve or thirteen years, at the end of which period the ſociety yielded up their charter and poſſeſſions to the king, who converted the college into a cathedral church, by tranſlating the epiſcopal ſee hither from Oſeney. The inſtitution now became an appendage to the cathedral, and received the name of "The Cathedral Church of Chriſt in Oxford, of king Henry the VIIIth's foundation." At the ſame time the ſociety was declared to conſiſt of a biſhop, with his archdeacon, a dean, and eight canons, who had all the college eſtates made over to them on condition of their maintaining three profeſſors of divinity, Hebrew, and Greek, one hundred ſtudents in theology, arts, or philoſophy, eight chaplains, and a numerous choir. The king is viſitor of this college.

The benefactors to Chriſt-church are few, and all of them appeared at a period long ſubſequent to its foundation. Among the principal of them were the celebrated Dr. Buſby of Weſtminſter, who bequeathed a ſum of money for a catechetical lecture; biſhop Fell, who contributed ten exhibitions of 10*l per annum* each; and Dr. Lee, phyſician to George II. who left 20,000*l.* for the purpoſe of erecting an anatomical theatre.

The buildings of this magnificent college occupy the area of the ancient priory of St. Frideſwide, and have undergone as many revolutions as the ſociety itſelf. They are chiefly arranged round four courts, two of which are very ſpacious. The great weſt quadrangle is particularly intereſting, as being the work of Wolſey, and indicates, that if that illuſtrious founder had ſurvived till he had been enabled to complete the deſign he appears to have formed, his college would have exceeded in magnificence every other in Europe. This quadrangle is entered by the gateway of the principal front, which extends 382 feet, and is adorned in the centre by a ſtately tower begun by Wolſey, but only completed in 1681, by ſir Chriſtopher Wren. All the buildings here are beautifully proportioned, and are faced with a fine terrace, as well as ſurmounted by a handſome ſtone balluſtrade. The hall and kitchen are on the ſouth, and on the eaſt and weſt ſides are ſplendid ranges of lodgings for the dean and canons. The hall occupies more than one-half of an entire range, and was begun and finiſhed under the direction of the founder. This room is 115 feet in length, 40 in breadth, and 50 in height. The roof is of oak, carved in an elaborate ſtyle. "The windows are interſected Gothic, and one in a receſs on the ſouthern ſide is among the fineſt ſpecimens of that mode of architectural diſpoſal." The ſide walls are of panelled wainſcot, and diſplay an extenſive collection of portraits, among which are an original half length of cardinal Wolſey, a whole length of king Henry VIII. another of queen Elizabeth, and a third of Dr. Buſby, with a pupil in attendance.

The ſecond great quadrangle of this college, termed Peckwater court, was erected at the commencement of the laſt century, and contains the library on its ſouthern ſide. This edifice is 141 feet long in front, and is adorned with maſſive pillars in the Corinthian ſtyle. Each of the other ſides is appropriated as lodgings for ſtudents. Their elevation is three ſtories, the lower of which is ruſtic, and "ſupports a range of architecture of the Ionic order," finiſhed by an entablature and balluſtrade of ſtone. In the library, which is rich in MSS. prints, and coins, is likewiſe a very noble collection of paintings, bequeathed to the college by brigadier-general Guiſe in 1765. Moſt of theſe paintings are by the old maſters, and muſt have been collected at an immenſe expence.

The two ſmaller courts are denominated Canterbury ſquare and Chaplain's court. Of theſe the firſt only deſerves to be noticed, being now the principal entrance into the college. It ſtands on the ſcite of Canterbury hall, which was founded in the fourteenth century by archbiſhop Iſlip, as a place for the ſtudy of the canon and civil law. The

deſign

deſign of this court was furniſhed by James Wyatt, eſq. architect, and the whole carried into execution under his direction. It was completed in 1783, chiefly through the munificence of Richard Robinſon, baron Rotheby, late lord primate of Ireland.

The cathedral of Chriſtchurch, to which the college is appended, will be noticed in the ſequel under the head of churches.

*Trinity College* was founded by ſir Thomas Pope, in the reign of Philip and Mary, from whom he obtained a royal licence and charter, dated the 8th and 28th March 1554. The ſociety was then made to conſiſt of a preſident, a prieſt, twelve fellows, and eight ſcholars, but the latter were ſoon increaſed to twelve. Theſe he placed in the tenements called Durham college, which he purchaſed and repaired for their accommodation. In 1556 he drew up a body of ſtatutes for their regulation, under the auſpices of the celebrated cardinal Pole, to whom it is ſuppoſed he was indebted for many uſeful hints. The ſame ſtatutes are ſtill in force, with ſome ſlight alterations made by the firſt preſident, with the conſent of the founder, after the re-eſtabliſhment of the Proteſtant worſhip, on the acceſſion of queen Elizabeth.

The endowment of this inſtitution by ſir Thomas was only limited by the extent of his means, which were happily ample. In May 1556 he gave the ſociety one hundred pounds; and before the cloſe of that year made over to them no fewer than thirty-five manors and thirteen advowſons, beſides impropriations and penſions. So liberal, indeed, was his donation, that with the exception of the contributors towards the new buildings few perſons have deemed it requiſite to become benefactors to this college, ſo that the ſociety remains nearly in the ſame ſtate as when originally founded, with the addition only of gentlemen commoners and commoners. The biſhop of Wincheſter is viſitor.

Architecturally conſidered, this college conſiſts of two courts. The firſt contains the chapel, the hall, the preſident's lodgings, the library, and ſome apartments for the fellows and ſcholars; and the latter is wholly occupied by lodgings for the reception of ſtudents. The chapel was built chiefly at the expence of Dr. Bathurſt, as is generally ſuppoſed after a deſign by dean Aldrich, corrected and improved by ſir Chriſtopher Wren. The interior is highly decorated. In a receſs at the upper end of this chapel is a monument in honour of ſir Thomas Pope, and of his third lady, with their whole length figures ſculptured in alabaſter.

*St. John's College.*—All the colleges hitherto noticed have owed their origin to the munificence of diſtinguiſhed ſtateſmen, or prelates; but we now come to one which was founded and endowed by an individual, whoſe fortune was gained by induſtrious exertions in the mercantile world. This was ſir Thomas White, a citizen and merchant of London, and one of the moſt liberal and benevolent characters of his age. The ſpot ſelected for the new foundation was the ſcite of St. Bernard's college, the buildings of which, indeed, ſtill form a ſmall portion of the preſent college. Here ſir Thomas fixed his ſociety in 1557, ſhortly after he had obtained a licence and charter for its inſtitution, and in the ſame year drew up a body of ſtatutes, declaring that it ſhould conſiſt of a preſident, fifty fellows and ſcholars, three chaplains, three clerks, and ſix choriſters; but the twelve laſt-mentioned members were ſoon diſcontinued, the funds being found inadequate to their proper ſupport. A ſuitable choir, however, has ſince been founded by ſir William Paddy, one of the numerous benefactors who have contributed to enrich the ſociety at different periods. Among theſe the chief were archbiſhops Laud and Juxon, and Dr. William Holmes and his lady. All the fellows of this college, except ſix of the founder's kindred, and two from Coventry, two from Briſtol, two from Reading, and one from Tunbridge ſchools, are elected from Merchant Tailor's ſchool in London, ſir Thomas having been a member of that reſpectable corporation. The biſhop of Wincheſter is viſitor.

The buildings of St. John's college, as they at preſent ſtand, have been erected at various periods. They are arranged chiefly in two quadrangles, one of which ſtill retains a part of the tenements which compoſed Durham college. In this diviſion are the hall and chapel, the preſident's lodgings and chambers for the fellows and ſcholars. The principal entrance is under a ſquare tower adorned with a ſtatue of St. Bernard placed in a richly canopied niche. On the eaſt ſide is a paſſage leading into the ſecond quadrangle, which contains the library, and was erected at the ſole expence of archbiſhop Laud, from a deſign by Inigo Jones. In the centre, both on the eaſt and weſt ſides, is a gateway of the Doric order, ſurmounted by a ſemicircular pediment of the Ionic and Corinthian, and having a ſtatue on either ſide between the columns. Theſe repreſent king Charles I. and his queen, and "were deſigned and caſt in braſs by Fanelli of Florence." The apartments, in the ſame range with the gateways, are built over cloiſters, ſupported by eight round arches, and adorned with buſts of the cardinal and Chriſtian virtues over each pillar. The library here is enriched with a valuable collection of books and MSS. and a variety of antiquarian curioſities.

*Jeſus College* owes its foundation to Hugh ap Rice or Price D.D. firſt prebendary of Rocheſter and treaſurer of St. David's. This benevolent character, obſerving that his countrymen, the Welſh, were ſcarcely ever noticed in collegiate endowments, reſolved to found a college peculiarly for their benefit, and with this view prevailed on queen Elizabeth to inſtitute the preſent eſtabliſhment by charter dated June 27, 1571. This deed preſcribed that the college ſhould be erected by the name of "Jeſus College, within the city and univerſity of Oxford, of queen Elizabeth's foundation," and declared the ſociety to conſiſt of a principal, eight fellows, and eight ſcholars. It further permitted Dr. Price to ſettle upon them an annual revenue of 160*l.*, to which he added a donation of 1500*l.* to aſſiſt in erecting the buildings, beſides a ſmall ſum which he bequeathed for the ſame purpoſe at his death. The queen, though nominally foundreſs, beſtowed little patronage and ſtill leſs property on her college, a circumſtance not a little remarkable, as we believe this to have been the firſt college in Oxford which could boaſt of deriving its origin from a Proteſtant benefactor. Hence, when Dr. Price died the funds of the ſociety were ſo much exhauſted as to ſtop for a time the progreſs of the buildings. But private munificence ſoon after ſupplied the want of regal bounty. The buildings were gradually completed, and many extenſive benefactions quickly added ſtability to the hitherto limited finances of the inſtitution. Sir Enbule Thelwall, beſides liberal donations, procured for the ſociety a new charter, dated June 1, 1622. Dr. Williams founded a logic lecture, and ſir Thomas Canon a catechetical lecture. Among the other more extenſive contributors were Henry Weſtphaling, biſhop of Hereford; Henry Rowlands, biſhop of Bangor; king Charles I.; Francis Manſell, D.D.; ſir Leoline Jenkins; and Edward Merrick M.A., treaſurer of St. David's; ſome of whom added new fellowſhips and ſcholarſhips. Theſe additional revenues rendered new charters neceſſary at different periods. The laſt was granted by George II. January 10, 1729, and under it the ſociety now conſiſts of a principal, nineteen fellows, and eighteen ſcholars,

lars, beſides a number of exhibitioners, &c. The earl of Pembroke is viſitor.

The buildings of Jeſus college form two quadrangles, the firſt of which meaſures 90 feet by 70, and the ſecond 100 feet by 90. The former, entered from the ſtreet, contains the chapel on the north and the hall on the eaſt ſides. The other ſides are occupied by apartments of three ſtories high. The front, in the ſtreet, was rebuilt in 1756, and is a heavy erection, deſtitute alike of intereſt and beauty. The ſecond, or inner quadrangle, was begun in 1640, under the management of Dr. Manſell, then principal; but the diſturbances ariſing from the rebellion prevented its completion till the year 1676, when it was finiſhed by ſir Leoline Jenkins, at his own expence. The library, on the weſt ſide of this quadrangle, contains a good collection of books and ſome curioſities, among which are an immenſe ſilver bowl, weighing 278 ounces, and capable of holding above ten gallons; a metal watch given by Charles I.; and a huge ſtirrup, ſaid to have been preſſed by the foot of queen Elizabeth. The chapel, built in 1621, is divided into three parts by two ſcreens. The roof is finiſhed in compartments, and is very richly decorated.

*Wadham College* was founded by Nicholas Wadham, eſq. and his wife Dorothy, daughter of ſir William Petre, an eminent benefactor to ſeveral colleges in this univerſity. The execution of the undertaking, however, wholly devolved on the latter, as Mr. Wadham himſelf died before the plan he had propoſed could be carried into effect. Her firſt ſtep was to purchaſe the ſcite of the ancient priory of Auſtin friars, once a place of great diſtinction in the univerſity, which ſhe accompliſhed in 1610, and on the 31ſt of July, in the ſame year, laid the firſt ſtone of the preſent college. A royal licence was obtained in 1611, and in 1612 the ſtatutes promulgated by the foundreſs received the ſanction of an act of parliament. By theſe ſtatutes, which ſtill continue in force, except as to the ſubject of marriage, the college was made to conſiſt of a warden, fifteen fellows, fifteen ſcholars, two chaplains, and two clerks. To theſe, however, ſeveral exhibitions have been added by ſucceſſive benefactors, among whom the late Dr. John Wills, who died in 1806, deſervedly holds the firſt rank. This gentleman bequeathed 400*l.* a-year to the wardenſhip; 1000*l.* to improve the warden's lodgings; two exhibitions of 100*l. per annum* each to two fellows, ſtudents in law or medicine; two exhibitions of 20*l.* to ſcholars in the ſame faculties; 20*l.* a-year for a divinity lecturer; an annual exhibition of 75*l.* and another of 100*l.* to two ſuperannuated fellows; 11*l.* 10*s.* to a preacher; and 6*l.* a-year for the purchaſe of books to be given as a premium to the beſt reader in the chapel. He further nominated the ſociety his reſiduary legatee.

The buildings are entirely compriſed in one very ſpacious quadrangle, about one hundred and thirty feet ſquare; the whole of which, with the exception of a building of three ſtories on the ſouth of the front, were erected by the foundreſs, at the expence of 10,816*l.* 7*s.* 8*d.* This college is entered by a gateway, under a central tower, and has on its eaſtern ſide the hall and chapel, and on the other three, the warden's lodgings, and apartments for the fellows, ſcholars, and ſtudents. In the middle of the eaſtern ſide is a portico in four compartments, adorned with ſtatues in canopied niches of the founder and foundreſs, and of king James I., whoſe arms, ſculptured in ſtone, are placed in the higheſt compartment. The biſhop of Bath and Wells is viſitor.

*Pembroke College* owes its foundation to the joint munificence of Thomas Teſdale and Richard Wightwick; for though in the charter, which is dated 1624, king James is denominated founder, and the earl of Pembroke, the chancellor of the univerſity, godfather, yet they in fact contributed little or nothing towards its eſtabliſhment, further than what their patronage may be ſuppoſed to have accompliſhed. According to the ſtatutes drawn up, agreeably to the charter, the ſociety was made to conſiſt of a maſter, ten fellows, and the ſame number of ſcholars; but the fellows have ſince been increaſed to fourteen, and the ſcholars and exhibitioners to twenty-one, by the liberality of different benefactors, among whom the moſt eminent were lord Oſſulſton, grandſon to the founder Teſdale, and George Morley, biſhop of Wincheſter. The chancellor of the univerſity is viſitor.

Pembroke college now forms two ſmall courts, which are built on the ancient ſcite of Broadgate's hall, ſome portion of which is ſtill ſtanding, and conſtitutes the hall of the preſent college. The principal court is uniform in its architecture, and poſſeſſes the merit of ſimplicity. It was chiefly erected at different periods during the ſeventeenth century, partly with the money of the founders, and partly by the aid of ſubſequent contributions. The front, which was only completed in 1694, is an unadorned elevation, with a low tower over the entrance in the centre. The chapel is a ſmall, but elegant edifice of the Ionic order, and is richly ornamented within.

*Worceſter College* was founded in 1714, under the will of ſir Thomas Cookes of Bentley Pauncefort, in Worceſterſhire, who died in 1702, and bequeathed 10,000*l.* to be applied either in eſtabliſhing a new college, or in the endowment of additional fellowſhips and ſcholarſhips in ſome previous eſtabliſhment. The truſtees at firſt heſitating which of the above plans to adopt, the money accumulated to 15,000*l.* before they came to the reſolution of founding the preſent inſtitution. This, however, they at length determined on, and a charter of incorporation was obtained in 1714 for a college, to be called "The Provoſt, Fellows, and Scholars of Worceſter College, in the Univerſity of Oxford." A body of ſtatutes were framed about the ſame time, and the ſociety ſettled in the ancient tenements of Gloceſter hall, ſome part of which ſtill remains. Several liberal benefactors ſoon after added conſiderable donations. Of theſe, the principal were Dr. James Fynney, George Clarke, D. C. L., and Mrs. Sarah Eaton, the laſt of whom endowed ſeven fellowſhips and five ſcholarſhips for the ſons of clergymen only. Hence the ſociety now conſiſts of a provoſt, twenty-one fellows, and fifteen ſcholars. The viſitors are the biſhop of Oxford and the vice-chancellor of the univerſity. A preference is given in the choice of ſtudents, on the original foundation, to perſons educated in the founder's ſchools of Bromſgrove and Feckenham, and to his own kindred.

The ſituation of Worceſter college is on the weſtern ſide of the city, on an eminence near the bank of the river Iſis. The buildings form a court, the ſouth ſide of which is ſtill occupied by a range of old apartments, but its other diviſions are all of modern erection, and compriſe a chapel, a hall, a library, and lodgings for the accommodation of members and ſtudents. The architecture of theſe portions is grand and impoſing, though ſimple and devoid of ornament. The library, however, is ſupported by a ſpacious cloiſter in the front towards the court, and is particularly remarkable for a valuable collection of architectural books and manuſcripts.

*Hertford College*, the laſt we have to notice, was the ancient Hart hall, which was founded by William Stapledon, biſhop of Exeter, and continued attached to Exeter college till the year 1740, when it was elevated to the rank of an independent college by Dr. Newton, who beſtowed upon it his whole property. This, however, has proved inſufficient for its intended purpoſes, and as few benefactors have appeared

peared in aid, the inſtitution is now much declined. Since 1805 it has had no principal, and at preſent there is only one fellow, though by the ſtatutes the ſociety was made to conſiſt of a principal, four ſenior fellows, and eight junior fellows or aſſiſtants. The chancellor of the univerſity is viſitor.

According to the deſign of Dr. Newton, the buildings of this college were to have formed one ſpacious quadrangle, containing a chapel, hall, and library, lodgings for the principal, and apartments for the ſociety. Of this plan only a part has hitherto been carried into execution, and that by the founder himſelf, no additions having been made ſince his death. The portions of Hart-hall ſtill remaining are, the refectory, built in the reign of queen Elizabeth, the old principal's lodgings, with the kitchen and chambers over them, and the gatehouſe and library.

Before particularizing the *halls*, it may be proper to obſerve, that previous to the foundation of colleges all the univerſity ſtudents lodged in tenements rented by citizens of Oxford, and that when a tenement was once ſo appropriated, the proprietor could never again recover it for other purpoſes, nor ſell or demiſe it, without binding the purchaſer to leave it open to the uſe of the univerſity, if required. When an advance of rent was demanded, the reaſonableneſs of the demand was determined by the arbitration of two maſters on the one part, and two citizens on the other, who were ſworn to do juſtice between the parties. Such places of education are of conſiderable antiquity, and were, probably, as we have already hinted, at firſt appended to monaſtic inſtitutions. In the time of Edward I. they are ſaid to have exceeded three hundred in number, but after the endowment of colleges began, they rapidly ſunk into neglect, and now only five remain, one of which is deſtitute of ſtudents. Each hall is governed by a principal, under the guidance of ſtatutes originally drawn up by the principal of the univerſity, and alterable at his pleaſure. This officer is officially viſitor of all the halls, and has the power of nominating the whole of the principals, except the principal of St. Edmund's hall, who is elected by the provoſt and fellows of Queen's college. The ſtudents in theſe halls have equal univerſity privileges with thoſe belonging to the colleges, and are ſubject to the ſame regulations with reſpect to diſcipline, courſe of ſtudies, tuition, length of reſidence, examinations, dreſs, &c.

*St. Alban's Hall*, the moſt ancient of thoſe now remaining, is ſituated on the eaſt ſide of Merton college. This hall derived its name from Robert de Sancto Albano, a burgeſs of Oxford, in the reign of king John. In the time of Henry VI. it was united to Nunne hall, which ſtood weſt from it, but its principa's were appointed by Merton college. Henry VIII. granted both halls conjoined, in the name of Alban hall, to his phyſician, from whom it paſſed to different proprietors, and is now the property of the warden and fellows of Merton college. The buildings of this hall form a quadrangle, plain in its architecture, but commodious in reſpect to internal arrangements.

*Edmund Hall* is traditionally ſo called from St. Edmund, archbiſhop of Canterbury, in the reign of Henry III. At the diſſolution it belonged to Oſeney priory, and ſoon after that event came into the poſſeſſion of Queen's college, and was renewed as a place of ſtudy under the auſpices of that inſtitution, to which it ſtill continues attached. Several extenſive additions to the old buildings of this hall have been made during the two laſt centuries, chiefly by the liberality of its own members, and thoſe of Queen's college. The library, begun in 1680, has been enriched by ſeveral valuable collections of books and MSS. This portion of the buildings, as well as the chapel, was erected by Stephen Penton, B.D. principal, and chiefly at his own expence.

*St. Mary's Hall* was anciently conveyed to the rectors of St. Mary's church for a parſonage houſe, and remained in their poſſeſſion till the year 1325, when Edward II. gave it, with the advowſon of the church, to the ſociety of Oriel college, who converted it into an academical hall in 1333, under its preſent appellation. The buildings are arranged in the form of a quadrangle, containing lodgings for the principal on the north, a hall and chapel on the ſouth, and apartments for the ſtudents on the weſt and eaſt, all of which have either been rebuilt, or much improved within the laſt century.

*New Inn Hall* is now entirely gone to decay, the only part of its buildings now remaining being a houſe for the principal, who is only nominally ſuch, there having been no ſtudents at this hall for many years. It was, at one time, however, very famous for ſtudents of the civil and canon law, and produced many eminent characters in that faculty. In 1642 it was occupied as a mint by king Charles I., who here melted down the plate preſented to him by the univerſity.

*St. Mary Magdalen Hall* was founded as a grammar ſchool in 1480, by William Waynflete, founder of Magdalen college, to which it immediately adjoins. It was firſt called Grammar hall, but received the name of Magdalen hall upon being enlarged, and placed upon the ſame footing with reſpect to academical privileges as the other halls. This foundation appears to have been generally in a very flouriſhing condition, and at one time is ſaid to have had nearly three hundred members, but it is difficult to conceive how ſo many perſons could be accommodated within its walls. Dr. William Lucy, and ſome other benefactors, have eſtabliſhed a number of exhibitions in this hall for the benefit and encouragement of the ſtudents. A part of the buildings has likewiſe been erected by the munificence of private individuals, among whom Dr. John Wilkinſon, principal from 1605 to 1643, and his ſucceſſor Henry Wilkinſon, are deſervedly the moſt noted. The latter built the library, and procured for it a good collection of books, which have been ſince increaſed by various contributions.

*Public Inſtitutions connected with the Univerſity.*—Beſides the colleges and halls there are ſeveral public buildings and eſtabliſhments, which either owe their origin to the univerſity, or are placed under the management of its officers. The principal of theſe are the ſchools; the Bodleian library; the theatre; the Clarendon printing-houſe; the Radcliffe library; the Aſhmolean muſeum; the obſervatory; the phyſic garden; and St. Mary's, or the Univerſity church, which laſt will be noticed under the head of churches.

The firſt *Public Schools* were erected about the commencement of the fifteenth century, by Thomas Hokenorton, abbot of Oſeney, and conſiſted of ten apartments, allotted to different branches of education. To theſe were added the divinity ſchool in the year 1427, the erection of which was chiefly effected by the liberality of Humphry, duke of Glouceſter, uſually ſtyled the Good. This laſt is ſtill ſtanding, and is a curious ſpecimen of architecture. All the others, however, were demoliſhed in the beginning of the ſeventeenth century, when the preſent ſchools were erected, which, with part of the Bodleian library, form a quadrangle of about one hundred and ſeventy feet in length. Over the gateway is a lofty tower, fantaſtically arranged in compartments, exhibiting an imitation of the five orders of claſſic architecture. (See Britton's Architectural Antiquities, vol. iii.) The whole quadrangle is now three ſtories high, two of which are appropriated as ſchools, while the third and higheſt is occupied

occupied as a picture gallery, and contains a numerous and ſplendid collection of the portraits of founders, benefactors, and other eminent perſons connected with the univerſity. The ſchools are governed by three maſters, who cannot hold their office more than two years in ſucceſſion. The public profeſſors read lectures here in the different ſciences, and here alſo the ſcholars of the univerſity are obliged, by ſtatute, to perform the exerciſes required of them, before they can obtain their degrees. In the moral philoſophy lecture room is preſerved a collection of ſtatues, marbles, and buſts, the gift of the counteſs dowager of Pomfret; and in an apartment on the north ſide of the ſchools, are ranged the Arundelian marbles, together with numerous other monuments of Grecian antiquity, collected by Selden, Wheeler, and others, and preſented or bequeathed to the univerſity.

The *Bodleian* or *Public Library* was founded by ſir Thomas Bodley at the cloſe of the ſixteenth century, on the remains of that which was eſtabliſhed by the duke of Glouceſter above-mentioned, but had been diveſted of all its valuable books and illuminated MSS. by the commiſſioners of Edward VI. This library occupies three extenſive rooms, diſpoſed in the form of the letter H, and probably contains the moſt valuable collection of books and MSS. in Europe, as the donations in aid of ſir Thomas's contribution have been ſplendid and liberal beyond precedent. Among thoſe who had added whole libraries to the original collection, are the earl of Pembroke, Mr. Selden, archbiſhop Laud, ſir Thomas Roe, ſir Kenelm Digby, general Fairfax, Dr. Marſhall, Dr. Barlow, Dr. Rawlinſon, Mr. St. Amand, Dr. Tanner, Mr. Willis, T. Hearne, Mr. Godwin and Mr. Gough. The laſt contributed all his topographical collections, books, prints, copper plates, and drawings.

The ſtatutes by which this library is governed, were drawn up by ſir Thomas Bodley, who, beſides his books, left an eſtate to the univerſity for the proviſion of ſuitable ſalaries to its officers, and for the repair of the buildings. Theſe ſtatutes are preſerved in the founder's own hand writing, in the archives of the library, and contain, among other clauſes, one appointing the vice-chancellor, proctors, and the regius profeſſors of divinity, law, medicine, Hebrew and Greek, viſitors or curators. The Rev. Bulkley Bandinel, M.A. is librarian.

The *Theatre*, or *Selden Theatre*, in which are held all the acts called the Encœnia, and Comitia, alſo lord Crewe's annual commemoration of benefactors, was built at the ſole charge of archbiſhop Selden, who, beſides, gave the ſum of 2000*l.* as a fund for repairs. The architect was ſir Chriſtopher Wren, who, in the plan and conſtruction of this edifice, gave a happy preſage of thoſe talents which he afterwards diſplayed in the metropolis. By an ingenious diſpoſition of its parts he has contrived to render it capable of holding nearly four thouſand perſons, though its dimenſions ſeem altogether inadequate for that purpoſe. The roof is eighty feet by ſeventy, and reſts entirely on the ſide walls, without any central ſupport. The exterior elevation on the ſide oppoſite to the divinity ſchool is adorned with columns of the Corinthian order, and ſtatues, in niches, of the founder, and the duke of Ormond.

The *Clarendon Printing-houſe* was erected in 1711, with the profits ariſing from the ſale of lord Clarendon's Hiſtory of the Rebellion, the copyright of which was preſented to the univerſity by his lordſhip's ſon. It is a maſſive ſtructure, two ſtories high, adorned in front with a portico of the Doric order, and has a ſtatue of the noble author over the ſouthern entrance. The buſineſs of this houſe is ſuperintended by perſons termed delegates of the preſs, who are appointed by the vice-chancellor and proctors.

The *Radcliffe Library*, which is certainly one of the moſt impoſing architectural ornaments of the univerſity, was founded by Dr. Radcliffe, an eminent phyſician in the reigns of king William and queen Anne, he having bequeathed 40,000*l.* for its erection, 150*l. per annum* for a librarian, and 100*l. per annum* for the purchaſe of books. The building itſelf was deſigned and executed by Gibbs, between the years 1737 and 1749; and ſome of the firſt artiſts of the age were employed on its interior embelliſhments. Exteriorly, a ruſtic baſement, in the form of a double octagon, ſupports a cylindrical ſuperſtructure, adorned with three-quarter Corinthian columns, ranged in couplets, between which are windows and niches alternately. A baluſtrade, finiſhed with vaſes on the piers perpendicular to the columns, ſurmounts the entablature, and the whole elevation is terminated by a fine cupola ſixty feet high, which renders this building a ſtriking feature in every diſtant view of the city. The contributions to this library are few, compared to thoſe to the Bodleian, which ſeems almoſt to have wholly engroſſed the munificence of the learned.

The *Aſhmolean Muſeum* owes its foundation to Elias Aſhmole, author of the Hiſtory of the Garter, who offered to beſtow on the univerſity all the extenſive collections in natural hiſtory which had been bequeathed to him by the two Tradeſcants, the celebrated naturaliſts and phyſic gardeners at South Lambeth, (ſee MUSEUM,) and to add to theſe his own coins, medals, MSS. and books, provided the univerſity would defray the expence of erecting a proper building for their reception. This offer was accordingly accepted, and the preſent edifice raiſed, under the direction of ſir Chriſtopher Wren. The contributors to this muſeum have been numerous. The chief of them were Dr. Plot, Mr. Llwyd, Mr. Borlaſe, and Mr. Reinhold Foſter. The contribution of this laſt conſiſts chiefly of curious articles from the South Sea iſlands. This building likewiſe contains the books of Dr. Liſter, and the MSS. of Dugdale, Aubrey, and Wood.

The *Aſtronomical Obſervatory* was built at the expence of 30,000*l.* defrayed by the truſtees of Dr. Radcliffe. It is ſituated at the extreme end of the north ſuburb, on a very appropriate ſcite with attached grounds, which were preſented to the univerſity by the duke of Marlborough. The central elevation of this edifice is upwards of 100 feet, and its third ſtory conſiſts of an octangular tower, with ſculptural repreſentations of the eight winds on the entablature, and a ponderous earth-coloured globe at the top. The whole ſtructure compriſes a dwelling-houſe for the obſerver, apartments for obſervation, for an aſſiſtant obſerver, and for lectures, and is ſupplied with a valuable ſet of aſtronomical inſtruments, beſides a library. See OBSERVATORY.

The *Phyſic Garden*, compriſing about five acres of ground, is ſituated oppoſite to Magdalen college, on the ſouth, and is encompaſſed by a lofty wall, with a handſome gateway, which was deſigned by the celebrated Inigo Jones. Over the arch of this gateway is a buſt of the founder, Henry Danvers, earl of Danby, and on the right and left are ſtatues of Charles I. and II. The garden is arranged in four quarters, and is provided with ſuitable green-houſes, and a hot-houſe for the reception of the more tender and exotic plants. The chief contributor to this garden was Dr. Sherard, who in 1728 left three thouſand pounds for the endowment of a profeſſorſhip of botany; and in 1793 a Regius profeſſor in that ſcience was likewiſe appointed by his preſent majeſty.

*Government and Civil Hiſtory of Oxford.*—The corporation of this city, eſtabliſhed both by charter and by preſcription, is governed by a mayor, a high ſteward, recorder, four aldermen, eight aſſiſtants, two bailiffs, a town-clerk,

clerk, two chamberlains, and twenty-four common-counſellors. By grant from Henry I. the mayor, for the time being, acts in the buttery at the coronation feaſts of the kings and queens of England; and hence, as well as from other cauſes, many of them have received the honour of knighthood. Oxford ſends two members to the national ſenate, and has done ſo, according to Willis, in his Notitia Parliamentaria, ſince the firſt inſtitution of a parliament in this iſland. The electors are the corporation and freemen, and the returning officers, the mayor and bailiffs.

Oxford is divided into four wards, under the immediate juriſdiction of the four aldermen; and theſe again, with the ſuburbs, are ſubdivided into fourteen pariſhes; St. Mary's, All-Saints, Carfax, or St. Martin's, St. Clements, St. Ebbs, St. Giles's, the Holy Croſs in Holywell, St. John's, St. Mary Magdalen's, St. Michael's, St. Peter's in the Eaſt, St. Peter's in the Bailey, St. Aldgate's or St. Old's, and St. Thomas's. The whole of theſe contain, according to the parliamentary returns of 1811, 2064 houſes, and 12,931 inhabitants, of whom 1015 perſons belonged to the colleges.

*Public Buildings belonging to the City.*—Beſides the colleges and the public ſtructures already mentioned as peculiarly connected with the univerſity, there are ſeveral others erected for religious and municipal purpoſes, which cannot properly be paſſed over unnoticed. Of the firſt deſcription are the cathedral, the pariſh churches, and the chapels of diſſenters; and under the latter we ſhall include the town and county-hall, the Radcliffe infirmary, the Houſe of Induſtry, the town and county gaol, the city Bridewell, the ſchools and alms-houſes, and the range of buildings for the market.

The *Cathedral Church* is ſituated to the eaſt of the grand quadrangle of Chriſtchurch college. It was originally the church of St. Frideſwide's monaſtery, on the ſcite of which the college is erected. This edifice is referred by King, in his Munimenta Antiqua, to the era of the Saxons; but Dugdale, Tanner, and Willis, date its foundation in the time of Henry I.; and as their opinions are generally more rational and probable than thoſe entertained by Mr. King, we are fully diſpoſed to coincide with them on this point. In its architecture this church preſents the ſtyles and examples of different ages, from the time of the original building, up to the commencement of the 16th century. The church is built in the ſhape of a croſs, and meaſures one hundred and fifty-four feet in length. In the centre riſes a tower, with a ſpire to the height of one hundred and forty-four feet. Some of the windows contain fine ſpecimens of painted glaſs, and in the north aiſle is a monument attributed to St. Frideſwide.

*St. Mary's Church*, or, as it is ſometimes called, the Univerſity Church, is a beautiful ſtructure, in the pointed ſtyle of the reign of Henry VII. The ſouth porch, with twiſted columns, is however a deformed and taſteleſs appendage. The church is ſituated on the north ſide of High-ſtreet, and conſiſts of a ſpacious chancel, and three aiſles, with a ſquare tower and ſpire, one hundred and eighty feet high. The tower is ſupported by two graduated buttreſſes at each angle, and is finely ornamented with ſtatues in niches, pinnacles, &c. In this church the public ſermons of the univerſity are preached on Sundays and holidays; and it is conſequently fitted up in a manner proper for the reception of the ſeveral members of that diſtinguiſhed corporation. The pulpit ſtands in the middle aiſle, and at its weſtern end is the chancellor's throne, which is elevated ſeveral ſteps above the other ſeats. Cloſe to the throne are the ſeats of the proctors, and next to them, on either ſide, ſit the doctors and heads of houſes.

The church of *All-Saints* is ſituated in the ſame ſtreet with St. Mary's, but is a ſtructure of a very different kind, being of comparatively modern erection, and in the ſtyle of ſacred architecture, which ſir Chriſtopher Wren contributed to render popular. This edifice compriſes a nave, a chancel, and two aiſles, and its roof is ſupported entirely upon the ſide walls, there being no pillars within the church, though pilaſters of the Corinthian order are frequent. The tower is ſurmounted by a turret, encircled by Corinthian pillars, whence riſes a ſpire. Between the lower range of windows are pilaſters of the ſame character, diſpoſed in couplets. The architect of All-Saints was Dr. Aldrich, dean of Chriſtchurch, who alſo deſigned the buildings of Peckwater-ſquare.

*St. Peter's in the Eaſt* is an intereſting edifice, of a very ancient date. It is commonly ſaid to be the earlieſt ſtone church erected in this part of England. The preciſe date of its foundation, however, is uncertain, as the claims of St. Grymbald to be the founder, are at leaſt as doubtful as the ſtory of his profeſſorſhip, under the patronage of king Alfred. This church was formerly the univerſity church, and the vice-chancellor and heads of houſes ſtill attend divine ſervice here in the afternoon of the Sundays during Lent. It has a nave, chancel, and two ſide aiſles, with a tower at the weſt end. The chancel is a ſingular and curious ſpecimen of architectural deſign; particularly in the ribs beneath the ceiling, and in two windows. Beneath the chancel is a crypt, ſupported by ſix circular pillars with ſquare baſes and capitals. Some of the latter are charged with very rude, but ſingular ſculpture. See Architectural Antiquities, vol. iv.

*St. John's Church*, which is likewiſe the chapel to Merton college, is a rich ſpecimen of the architecture of the 15th century, and in higher preſervation than uſually happens with the buildings of that age. Its members are a choir, a croſs aiſle, an anti-chapel, and a ſquare tower, which riſes from the centre of the croſs aiſle, and is elegantly adorned with panelling and pinnacles. The windows, both of the choir and croſs aiſle, are filled with painted glaſs: ſo is likewiſe the great eaſt window, the maſonry of which is exquiſitely delicate. Near the altar of this church are the monuments of the diſtinguiſhed benefactors to the univerſity, ſir Thomas Bodley and ſir Henry Savile; and cloſe to the door is a ſmall mural tablet, commemorative of the celebrated Oxford hiſtorian, Anthony a' Wood.

*Carfax*, or *St. Martin's Church*, is compoſed of a nave, two narrow aiſles, and a chancel, with a tower at the weſt end, which was reduced to its preſent height in the time of Edward III., on a complaint by the ſcholars that the townſmen frequently took poſſeſſion of it "in time of combat," and annoyed them therefrom with ſtones and arrows, as from a caſtle.

*St. Clement's Church* is a ſmall building of one aiſle and a chancel, and a low tower at the weſt end. *St. Ebbs*, ſo called from Ebba, daughter of Ethelfrid, king of Northumbria, is likewiſe of ſmall dimenſions, containing a nave, north aiſle, and chancel. *St. Giles's* was erected in the 12th century, as ſome ſay, on the ſcite of an ancient Britiſh temple. This ſtructure conſiſts of a nave, chancel, and a north and ſouth aiſles, and has an embattled tower at the weſt end. *Holywell Church* is a ſmall building, ſuppoſed to have been erected by Robert de Oigli, the founder of the caſtle. *St. Michael's Church*, originally belonging to the canons of St. Frideſwide, is now a curacy incorporated into one collegiate church, with the college of Lincoln. The tower of this edifice is of great antiquity, but its other parts are of late erection. So likewiſe is the church of *St. Peter's in the Bailey*, which is a ſtone building, finiſhed in 1740. *St. Aldgate's*, on the other hand, is very ancient, having been uſed as a cloiſter to receive perſons training for the priory of St. Frideſwide and

and Abingdon-abbey. It is an irregular pile, erected at different periods. *St. Thomas's* is alſo of ancient date, having been founded in 1141 by the canons of Oſeney, and dedicated firſt to St. Nicholas and afterwards to St. Thomas à Becket. This building conſiſts only of one aiſle and a chancel, with an embattled tower at the weſt end.

As diſſenters from the eſtabliſhed church are comparatively few in Oxford, meeting-houſes are neither frequent nor ſpacious in extent. Indeed, almoſt the only regular ſectarian chapels here are thoſe belonging to the Roman Catholics, the Quakers, the Methodiſts, and the Baptiſts.

Among what have been termed the municipal public buildings in Oxford, the *Town and County Hall* may properly claim the precedence as the ſeat of the courts of juſtice, and the focus of the municipal authority. It is a ſpacious edifice of ſtone, having a pediment over the centre of the front, which exhibits a range of ruſtic work in its lower diviſion. The expence of erecting it was chiefly defrayed by Thomas Rowney, eſq. late high ſteward of the city.

The *Radcliffe Infirmary* is one of the public edifices conferred on Oxford by the munificence of Dr. Radcliffe: it having been built by his truſtees with part of the funds remaining in their hands after the completion of the Radcliffe library. It is a ſtone building, well adapted for the reception of patients, and has extenſive grounds attached, the donation of T. Rowney, eſq. above mentioned. The charity is ſupported by voluntary ſubſcriptions.

The *Houſe of Induſtry* ſtands near the infirmary. It was built for the reception of the poor of eleven pariſhes, and is conſequently a ſtructure of conſiderable extent, but poſſeſſes no architectural features worthy of remark. The other principal charitable inſtitutions in Oxford are, Boulter's and Stone's alms-houſes, and four charity-ſchools, one of which, for fifty-four boys, is ſupported by the univerſity.

The *Town and County Gaol* is a large edifice of ſtone, with ſeparate lodgings, and yards of exerciſe for the debtors and felons. It occupies a part of the ſcite of the old caſtle, built by Robert de Oigli, and diſplays much more lightneſs and architectural taſte than is uſual in ſtructures of a ſimilar deſcription. It was deſigned and erected by D. Harris, eſq. architect.

The *City Bridewell* is a modern building, ſubſtantial in its conſtruction, and well arranged for the purpoſes to which it is appropriated. Before the erection of this edifice, in 1789, offenders, within the juriſdiction of the mayor, were placed in a priſon over the north-gate, called Bocardo, where Cranmer, Ridley, and Latimer were confined, and whence they were led to the ſtake. In a ſmall room, which forms the entrance to the Bridewell, is ſtill preſerved the door which is ſaid to have led to the cell of theſe illuſtrious martyrs.

The *General Market-houſe* is a commodious range of building, erected under the authority of an act of parliament, and certainly conſtituting one of the greateſt improvements effected during the laſt century. It is ſeparated into three diviſions, one appropriated to butchers, a ſecond to the venders of poultry, bacon, &c., and a third to the ſale of vegetables and fruits. Round the whole are ranges of ſhops under an arcade.

*Monaſtic Antiquities of Oxford.*—This city, as has been already hinted, contained no fewer than nineteen religious houſes prior to the reformation, ſome of which were converted into collegiate eſtabliſhments. The names of theſe monaſtic inſtitutions were as follows: 1. St. Frideſwide's priory; 2. St. George's college; 3. Oſeney abbey; 4. Rowley abbey; 5. St. Bernard's college; 6. Canterbury college; 7. Durham college; 8. Glouceſter-hall; 9. London college; 10. St. Mary's college; 11. St. Bartholomew's hoſpital; 12. St. John's hoſpital; 13. Auſtin Friars; 14. Black Friars; 15. Grey Friars; 16. White Friars; 17. Crouched Friars; 18. Friars de Sacco; and 19. Trinity-houſe.

*St. Frideſwide's Priory* is ſaid to have been originally founded for nuns of noble birth, by Didanus, an earl of Oxford, about the year 727, and to have derived its name from Frideſwide, his daughter, whom he appointed the firſt prioreſs. In 1111 it was made the ſeat of a ſociety of regular Auguſtine canons, and continued ſuch till its ſuppreſſion, when the ſcite and buildings were granted to cardinal Wolſey for his college of Chriſtchurch.

*St. George's College* ſtood within the caſtle. It was founded and endowed in 1074, by Robert de Oigli and Roger Iveri, for ſecular canons, who were diſperſed in 1149.

*Oſeney Abbey* was originally a priory for Auſtin canons, founded by Robert de Oigli, nephew to the founder of the caſtle, but was ſhortly after conſtituted an abbey. The abbey church was for a few years the cathedral church of the ſee of Oxford, at its firſt eſtabliſhment. This religious houſe was ſituated on one of the ſmall iſlets formed by the Iſis, at a ſhort diſtance from the ſcite of the caſtle, where its ruins may ſtill be traced.

*Rowley* or *Ruley Abbey* was founded by Edmund, earl of Cornwall, and filled with monks of the Ciſtercian order, about the year 1280. Some fragments of the buildings of this monaſtery ſtill remain in the weſtern ſuburbs.

*St. Bernard's College* was founded in 1436, by Henry Chichele, archbiſhop of Canterbury, for ſtudent monks of the Ciſtercian order. Its ſcite is now occupied by St. John's college, having been purchaſed by ſir Thomas White from the dean and canons of Chriſtchurch, to whom it had been granted at the diſſolution.

*Canterbury College*, founded by Simon de Iſlip, archbiſhop of Canterbury, for ſtudents in religion and civil law, is now included in Chriſtchurch college, having been granted to the dean and canons of that cathedral, ſhortly after the general ſuppreſſion.

*Durham College* ſtood on the ſcite now occupied by Trinity college. It was founded and endowed in 1290, by the prior and monks of the cathedral convent of Durham, for young ſtudents of their own order. At the diſſolution, it was granted to the dean and chapter of that church, by whom it was transferred to ſir Thomas Pope.

*Glouceſter Hall* or *College* owed its origin to ſir John Giffard, lord of Brimesfield, A.D. 1283. After the ſuppreſſion, it became the palace of the biſhops of Oxford; but was ſoon reſumed by the crown, and ſubſequently fell into the poſſeſſion of ſir Thomas White. The buildings of this hall at preſent conſtitute a part of Worceſter college.

*London College* was originally Burnell's Inn, but changed its deſignation about the year 1421; from which time it was inhabited ſolely by black monks and ſecular ſtudents in the civil law, till its diſſolution.

*St. Mary's College* was founded in 1435, by Thomas Holden and his wife, for ſtudent canons of the Auguſtine order. The ſcite of it was granted by Henry VIII. to William Rameſden and Richard Vaſavor.

*St. Bartholomew's Hoſpital* ſtands about half a mile eaſtward from the city. It is of great antiquity, and generally ſuppoſed to have been founded by Henry I. King Edward III. gave it, A.D. 1328, to Oriel college, upon condition of that ſociety maintaining therein a chaplain and eight poor brethren.

*St. John's Hoſpital*, which occupied the ſcite of the preſent college of St. Mary Magdalene, was in exiſtence as early as the reign of king John; but the preciſe date of the original foundation is unknown. It appears, however, to

have been new founded, or at leaſt new built, A.D. 1233, by king Henry II., who laid the firſt ſtone himſelf. In 1456 it was conveyed to William Waynflete, biſhop of Wincheſter, who erected on its ſcite his magnificent college.

The *Auſtin Friars* founded a priory here in 1268, on a piece of ground in the pariſh of Holy-croſs, or Holy-well, given to them by king Henry III., at the inſtance of ſir John Haudlo. At the ſuppreſſion, the ſcite was ſold to the duke of Suffolk, from whom it was purchaſed by Mrs. Wadham, and the college which retains her name erected thereon.

The *Dominican, Preaching*, or *Black Friars*, in the firſt year of their arrival in England, A.D. 1221, built a houſe and a chapel in the pariſh of St. Edward, on a plot of ground given them by Iſabel de Balbec, widow of Robert, earl of Oxford. This place, however, afterwards proving too confined for them, they removed, about 40 years after, to a ſmall iſland near the Watergate, where they continued to reſide till the diſſolution.

The *Franciſcan* or *Grey Friars* had their houſe in the pariſh of St. Ebb. The chief founder and benefactor of this eſtabliſhment was H. III. It was granted, 36 H. VI., to Richard Andrews and John Howes.

The *Carmelite* or *White Friars* firſt ſettled in Oxford A.D. 1254, in a houſe given them by Nicholas de Meules near the river, oppoſite to Rowley. About 60 years afterwards, however, they were transferred by king Edward II. to the ancient palace of Beaumont, which they poſſeſſed till the ſuppreſſion.

The *Crouched* or *Croſſed Friars* firſt fixed their habitation in Grantpoint, near Broadgate-hall; but about the year 1348, they procured a houſe and chapel in the vicinity of the church of St. Peter's in the Eaſt.

The houſe of the *Friars-de-Sacco*, or *de penitentia Jeſu*, ſtood near the Weſt-gate, on the ſcite of the very ancient church of St. Benedict or Burdoc. Theſe friars were ſuppreſſed, with ſome other mendicant orders, A.D. 1307, when the houſe and its appurtenances were beſtowed on the Grey friars.

*Trinity Houſe* was founded by Edmund, earl of Cornwall, in 1291, for the reception of "Trinitarian friars of the redemption of captives," who reſided here, and in the chapel of the Holy Trinity within Eaſt-gate, till nearly the time of the general diſſolution.

The *Palace of Beaumont* above mentioned, as beſtowed on the Carmelite friars, ſtood on the weſt ſide of the city. It was built by Henry I. before the year 1128, and continued to be a favourite regal reſidence during ſeveral ſucceeding reigns. Henry II. ſpent much of his time in this palace, which had the honour of giving birth to his gallant ſon, Richard I. All the buildings were pulled down at the diſſolution except the hall, the materials of which were afterwards uſed by archbiſhop Laud, in his additions to St. John's college. Only a ſmall low fragment of them, therefore, now remains, and this appears to have conſtituted a part of one of its inferior diviſions.

The *Caſtle*, built, or, as King ſuppoſes, reſtored, by Robert de Oigli, was a fortreſs of prodigious ſtrength, and occupied a great extent of ground cloſe to the river Iſis, towards the weſtern ſide of the city. Being in a neglected ſtate, and much decayed in the reign of Charles I., it was repaired and rendered a poſt of defence by that monarch; but after it became poſſeſſed by the parliament, a great part of its buildings were demoliſhed. Hence the only remains of it now in exiſtence are the mount, a crypt, and the ſhell of one of the original towers, which is a ſquare, maſſive ſtructure, lighted by a few loop-holes only, and having a projecting baſtion turret at one angle, through which a narrow ſtair-caſe leads to the top of the caſtle. It now conſtitutes part of the gaol.

*Eminent Natives of Oxford.*—Though this city has been for ſo many ages the ſeat of learning, and "nurſery of talents," it does not appear to have given birth to many eminent or illuſtrious characters. Beſides Richard I., we do not find the names of any very conſpicuous perſonages ranked among the native "worthies" of this city. The following perſons, it is believed, conſtitute nearly the whole number: Thomas Cowper, biſhop of Wincheſter, Thomas Harriot, who invented the preſent mode of notation in algebra, the Rev. William Chillingworth, ſir William D'Avenant, Dr. Charles D'Avenant, his ſon, Dr. Edward Pococke, Anthony A. Wood, (ſee a very ample memoir of him in "Athenæ Oxonienſes," 4to. 1813,) ſir Matthew Wright, Barten Holyday, William Joyner or Lyde, Gerard Langbane, author of an account of the Engliſh dramatic poets, Samuel Welles, and Dr. Edward Wootton.

The preceding account of Oxford has been derived from perſonal knowledge of the city, and from ſeveral publications of the beſt authority; but it is regretted that the nature of the preſent work will not admit of a more copious narration. The chief books conſulted are "The Hiſtory and Antiquities of the Univerſity of Oxford," by Anthony A. Wood, M.A., edited and much enlarged by John Gutch, M.A., in 5 vols. 4to., publiſhed in the years 1786, 1790, 1792, and 1798. This work contains a large maſs of information, the moſt eſſential facts in which, with the addition of much biographical and critical materials, are introduced into "A Hiſtory of the Colleges, Halls, and public Buildings attached to the Univerſity of Oxford, including the Lives of the Founders, by Alexander Chalmers, F.S.A.," 2 vols. 8vo., 1810. The author of this intereſting work promiſes, in his introduction, "to enter more fully into the hiſtory of the univerſity, from the earlieſt times." "The Oxford Univerſity Calendar for the year 1813," 12mo., is an entirely new publication, and is a very uſeful and intereſting vade mecum. "The Oxford Guide," or "Companion," is a ſuperficial little volume, and unworthy of this learned city. It was ſatirized by T. Warton, in "A Guide to the Companion, and Companion to the Guide." "Oxoniana," 4 vols., 12mo., contains many curious anecdotes relating to the univerſity, city, and to perſons connected with both. In The Beauties of England, vol. xiii., Mr. Brewer has given a very judicious epitome of the hiſtory of Oxford, with accounts of all the principal places in the county. "The Hiſtory of the Univerſity of Oxford, with 80 coloured Engravings," to be completed in 2 vols. 4to., is an elegant work now publiſhing in monthly numbers. The following publications contain much valuable and uſeful information reſpecting different colleges: Wood's Athenæ Oxonienſes, a new edition of which is now printing under the careful and able editorſhip of Philip Bliſs, fellow of St. John's college; Churton's Lives of the Founders of Brazen-noſe College; Lowth's Life of William of Wykeham, founder of New College; Warton's Life of Sir Thomas Pope, Founder of Trinity College; Chandler's Life of William Waynflete, Founder of Magdalen College; Spencer's Life of Henry Chichele, Founder of All-Souls College.

OXFORD, a townſhip of America, in Worceſter county, Maſſachuſetts; 11 miles S. of Worceſter, and containing 1237 inhabitants.—Alſo, a town taken from the north part of Derby, in Connecticut, 17 miles N.W. of New Haven; containing 1400 inhabitants.—Alſo, a poſt-town of New York, in Chenango county, between Jericho and Norwich;

incorporated in 1793, and containing an incorporated academy, and 1405 inhabitants.—Alſo, a townſhip of New Jerſey, in Suſſex county, on the E. bank of Delaware river, 15 or 20 miles N.E. of Eaſton, in Pennſylvania, containing, in 1790, 1905 inhabitants.—Alſo, a townſhip of Pennſylvania, in Philadelphia county; containing 1518 inhabitants.—Alſo, a townſhip in Grenville county, upper Canada, ſituated in the rear and to the northward of the townſhips of Edwardſburg and Auguſta, and watered by the Radeau.—Alſo, a townſhip upon the Thames, in the weſtern diſtrict, Upper Canada, S. of Dundas-ſtreet, where the weſtern end of that road meets the upper forks of the river Thames.—Alſo, a town in New Hampſhire, Graſton county, containing 988 inhabitants.—Alſo, a town called Upper Oxford, in Cheſter county, Pennſylvania, having 620 inhabitants.—Alſo, a port of entry, on the E. ſhore of Cheſapeak bay, in Talbot county; 13 miles S. by W. of Eaſton, and about 48 S.E. of Baltimore.—Alſo, a ſmall poſt-town of North Carolina; 36 miles from Hillſborough, and about 416 from Philadelphia.

OXFORDSHIRE, one of the central counties of England, is bounded by Glouceſterſhire on the weſt; by Buckinghamſhire on the eaſt; by Berkſhire on the ſouth, ſouth-weſt, and ſouth-eaſt; by Northamptonſhire on the north; and by Warwickſhire on the north-weſt. In figure this county is extremely irregular, being only ſeven miles in breadth in the centre, while its ſouthern diviſion is about twelve miles in diameter, and its northern half varies from little more than a mile, to thirty-eight miles in width. This latter portion, in proceeding northward from the centre, aſſumes the form of a cone, which terminates at what is denominated the Three-ſhire ſtone, in a complete point or apex. The total area of the county is computed, by Mr. Davis, at 742 ſquare miles, or 450,000 acres, of which 309,000 lie to the north, and 141,000 to the ſouth-eaſt of Oxford; but in the table of poor rates drawn up under the inſpection of the right honourable George Roſe, the number of acres is eſtimated at 474,880.

*Hiſtorical Events.*—When the Romans obtained poſſeſſion of Albion, Oxfordſhire, with ſome portion of the county of Glouceſter, conſtituted the dominions of a Britiſh tribe called the *Dobuni*, who, according to Camden, derived their name from the word *Duffen* or *Dwfn*, which ſignifies deep, or low; becauſe inhabiting a plain or valley encompaſſed with hills. Other writers, however, ſuppoſe their appellation to be a compound of the terms *dob*, a ſtream, and *en*, land; in alluſion to their reſidence in the vicinity of the river Iſis or Thames. The Dobuni ſeem to have been of a leſs warlike diſpoſition than moſt of their neighbours. Before the arrival of the Romans, they were held in ſubjection by the Cattieuchlani, whoſe domination was ſo galling, that the Dobuni immediately embraced the protection of the new invaders, and were admitted as tributary allies of the Roman people. Hence Cogidumnus, their legitimate prince, was not only continued in the government of his own territories, but had other ſtates placed under his authority. The ſame power and privileges deſcended to his ſucceſſors, each of whom, in union with his ſubjects, evinced on all occaſions a firm adherence to their illuſtrious ſuperiors, during the whole period of the reſidence of the Romans in Britain.

But though the Dobuni yielded thus eaſily to the yoke of Rome, they diſdained to bend without a valiant reſiſtance to the treacherous Saxons, whom their king unhappily concurred in inviting to England, to aſſiſt in repelling the invaſions of the northern barbarians. Theſe, on the contrary, they oppoſed with as much firmneſs and reſolution as animated the inhabitants of any other diſtrict, and were indeed among the laſt of the Britons who could be brought to ſubmit to the Saxon dynaſty. When this event happened, however, and the heptarchy was fully eſtabliſhed, Oxfordſhire became part of the powerful kingdom of Mercia, and remained annexed to that monarchy to the lateſt period of its independence. During this era, Dorcheſter was made the ſeat of a biſhop's ſee, afterwards removed to Lincoln, in the reign of William the Conqueror. The name Dobuni was at the ſame time loſt, and that of Wiccii applied to the inhabitants of the whole diſtrict which that tribe had formerly poſſeſſed.

Towards the end of the ninth century, when the Danes firſt penetrated into Mercia, they fixed their head-quarters for ſome time at Reading, in Berkſhire, and ravaged all the ſouth-eaſtern part of the county of Oxford. On this occaſion little oppoſition appears to have been made to their inroads by the Wiccii; but in the ſubſequent conteſts which enſued between the Danes and the Saxons, ſeveral very obſtinate and furious engagements were fought within the limits of Oxfordſhire. Hoke-norton is remarkable for a dreadful ſlaughter of the Kentiſh diviſion of the army of Edward the Elder, by the Danes, and the Five Burgher inſurgents under the command of Ethelwald. The victory, however, was dearly purchaſed, and Ethelwald having fallen, Edward had the ſatisfaction of finding himſelf freed from a dangerous competitor.

In the wars between the houſes of York and Lancaſter, ſeveral perſons of eminence belonging to this county loſt their lives and properties; but it had the good fortune to eſcape the deſtructive ravages, which at this period deſolated many other diſtricts of the kingdom. In one inſtance only did the partizans on either ſide enter Oxfordſhire in arms. This was in the year 1469, when the earl of Warwick took poſt near Banbury, and ſoon after completely overthrew the Yorkiſts, under the command of the earl of Pembroke, whom he took priſoner, and thus paved the way for the temporary reſtoration of Henry VI. The ſcene of this deciſive action was the plain called Daneſmore, on the border of the county.

Oxfordſhire, however, was not ſo much favoured during the next great civil conteſts, which divided the people of England, and deluged her fertile fields with the blood of her own citizens; for though the inhabitants do not ſeem to have embraced with cenſeleſs zeal either the republican or the royal cauſe, it was their calamity to feel the iron rod of war with peculiar ſeverity. The contending armies frequently traverſed the county from one extremity to the other, levying contributions, and committing exceſſes equally deſtructive to the great body of the people, whether the troops in poſſeſſion marched under the banners of the king, or of the parliament.

*General Aſpect, Soil, and Climate.*—Oxfordſhire exhibits conſiderable variety of aſpect. In its ſouthern diviſion, an alternation of hill and dale is productive of many pleaſing diſplays of pictorial ſcenery. The Chiltern hills, partly clothed with wood, and ſometimes arable, almoſt to their ſummits, poſſeſs a rich diverſity of appearance. The middle diſtrict of the county is deſtitute of this inequality of ſurface ſo favourable to beauty, but it is well wooded and highly fertile. In proceeding more to the north the ſame flatneſs prevails, and as the fields are generally incloſed by ſtone fences, the eye "is often fatigued by a rude and frigid monotony of ſcene."

The ſoils of Oxfordſhire are divided by Mr. Young, in his Agricultural Survey, into four different claſſes, of which, he obſerves, three are ſo marked by nature, as to allow of little doubt reſpecting them. Theſe are the Redland, the

Stonebraſh, and the Chiltern. The Redland abounds chiefly in the northern diſtrict, and is certainly the beſt ſoil in the county. "It is deep, found, friable, yet capable of tenacity; and adapted to every plant that can be truſted to it by the induſtry of the cultivators." The extent of land in which this ſoil prevails is 79,635 acres. The Stonebraſh diſtrict is more extenſive, and includes the greater part of the middle diviſion of the county. It is eſtimated to contain 164,023 acres, almoſt the whole of which is incloſed. The predominant feature of this tract is a "ſurface of greater or leſs depth, of a looſe, dry, friable ſand or loam, apparently formed of abraded ſtone, and abounding with many fragments of it." It is excellently adapted for turnips, and is likewiſe calculated for the culture of wheat. The Chiltern diſtrict to the ſouth conſiſts of 64,778 acres of a ſandy loam, of more or leſs depth, intermixed with flints, and reſting on a bed of chalk, which is in ſome places very white and pure, but in others imperfect, and in all containing a great proportion of calcareous earth. The other ſoils in the county are ranged under the general appellation of "miſcellaneous loams," which are calculated to occupy 166,400 acres. They include all ſorts of ſoil, from looſe ſand to heavy clay.

The *climate* of Oxfordſhire, as may be ſuppoſed, is conſiderably affected by the ſurface varieties we have juſt mentioned. In the northern diviſion, where the country is incloſed principally by ſtone fences, and where plantations are ſcanty, the air is generally cold and piercing during the greater part of the year, and exceſſively hot in the ſummer months. It is cold, alſo, throughout the whole Chiltern diſtrict, eſpecially on the poor chalk lands, at the foot of the hills, where it is remarked that the froſt will take effect ſooner, and continue longer, than on the deeper lands in the vicinity. In warm ſeaſons, the ſame diſtrict is uſually moiſt, owing to the fogs, which are more frequent on the hills and woods than in the vales.

*Mineralogy*.—Oxfordſhire poſſeſſes little to boaſt of in a mineralogical eſtimate. Dr. Plot, indeed, ſuppoſes that a ſilver mine was wrought formerly in the Chiltern diſtrict, but this opinion we are inclined to regard rather as an hypothetical concluſion, than the reſult of obvious deduction. At preſent no metal whatever is found in any part of the county. Freeſtone quarries, however, are frequent, and both limeſtone and ſlate are plentiful. Near Shotover is a conſiderable quantity of ochre, which the learned naturaliſt abovementioned characteriſes as "the beſt of its kind in the world, being of a true yellow colour, and very weighty." The clays in the neighbourhood of Oxford were anciently uſed by potters with ſome ſucceſs, but their quality is very inferior for the purpoſes of pottery to the clays of Staffordſhire, and the manufacture has been long diſcontinued.

*Rivers*.—No county in England is more plentifully ſupplied with rivers than that of Oxford. Dr. Plot ſays there are no leſs than ſeventy diſtinct ſtreams, which either take their riſe in this county or flow through it, nor do we believe the number is at all exaggerated, though at the ſame time it muſt be admitted that only a few of them are entitled to the denomination of conſiderable rivers. The principal of them are the Thame, the Iſis, the Charwell, the Evenlode, the Glym, the Ray, and the Windruſh. The whole of theſe rivers unite with each other at different points of the county, and eventually conſtitute the Thames or Thamiſis. The chief branch of this river enters Oxfordſhire, under the denomination of the Iſis, at Kelmſcot, and proceeds in an irregular channel by Tyneſham, Godſtow, Oxford, and Abingdon, in Berkſhire, to Dorcheſter, where it is joined by the Thame, and is then called the Thames. Thence it continues its courſe by Wallingford, Goring, Whitchurch and Caverſham, to Henley, near which town it paſſes into Buckinghamſhire. Throughout the whole of its current by Oxfordſhire this river forms the boundary between it and the county of Berks, and exhibits in the ſcenery of its banks much variety and beauty of aſpect.

*Tenures, Eſtates, &c.*—The tenures, by which the landed property of Oxfordſhire is held, are analogous to thoſe moſt common in all the ſouthern counties of England. Freehold and copyhold leaſes for lives are prevalent, but more particularly church and college leaſes, both for lives and for a certain term of years. The uſual fine is one year and a half's rent. Eſtates of courſe vary greatly in extent. Some few noblemen and gentlemen have very large poſſeſſions here. Theſe, with the eſtates belonging to the church, and different corporate bodies in the univerſity, occupy a great proportion of the landed property of the county. There are, however, many middling proprietors and ſome of a ſmaller claſs. A few of the former, and almoſt all of the latter, cultivate their own grounds, and, generally ſpeaking, appear to live in a reſpectable and comfortable manner. The price of land here is averaged by Mr. Turner at 26 years' purchaſe.

*Leaſes, Size of Farms, Rents, Tithes, &c.*—Oxfordſhire, notwithſtanding all the advantages of learning it poſſeſſes, muſt be ranked among thoſe counties in which the leading principles of agricultural proſperity are either miſunderſtood, or neglected from falſe and intereſted motives. The ſyſtem of leaſes, ſo decidedly favourable to the improvement of property, is here almoſt totally neglected; and even in thoſe caſes where leaſes are granted, their duration is limited to ſo ſhort a period as to render them of little avail. From this general remark, however, a few gentlemen ought undoubtedly to be excepted, who uſually grant leaſes for fourteen or twenty-one years, upon a decided conviction of the utility of the practice, which it is wonderful any individual ſhould queſtion. "Let all England," ſaid one of theſe gentlemen juſtly to Mr. Young, "be farmed without leaſes, and tithe every where taken in kind, and England from that hour ſtarves." The ſubject, therefore, is important, and deſerves the moſt ſerious attention; for the plan of no-leaſes, being at once injurious to the cultivator and to the landlord, muſt conſequently retard the national proſperity.

Farms in this county differ conſiderably in extent, but they are moſtly inferior in ſize to thoſe in the other counties of England. In the foreſt diviſion there are few farms which pay more than 20*l.* a-year of rent. In the rich Thame diſtrict they ſeldom exceed 300 acres. About Stoken-Aſh there are none capable of maintaining more than 200 or 300 ſheep. For ſome miles round Blenheim, farms are in general from 100 to 500 acres, here and there a larger, and ſome ſmaller. Rents are thus averaged by Mr. Young; Redland 30*s*., Stonebraſh 20*s*., Chiltern 16*s*., and miſcellaneous loam 25*s*.; ſo that the average of the whole county is 22*s*. 10*d*. *per* acre, and its entire rental about 543,297*l*. 1*s*. 6*d*. This average, however, is probably ſomewhat increaſed ſince the date of that gentleman's report in 1807.

Tithes are of different deſcriptions in this county. Some rectors have one in fifteen and ſome one in twenty only. The average of commutation for arable land fairly let, is one-fourth of the rent. On other grounds, however, it is much lower.

*Agriculture*.—Notwithſtanding the diſadvantageous circumſtances above-mentioned, it is but juſtice to the Oxfordſhire farmers to remark, that the practice of agriculture has made rapid ſtrides in improvement within the laſt century.

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The ſyſtem of common field huſbandry has been gradually ſinking in repute, and the whole county is now nearly incloſed. The rotation of crops varies according to the ſoil. In the Redland diſtrict the uſual courſe is 1, turnips; 2, barley or ſpring wheat; 3, clover; 4, wheat; 5, beans or peas; 6, oats. On the Stonebraſh lands; 1, turnips; 2, barley, with clover, rye graſs, or trefoil, or mixed; 3 and 4, clover, &c. as above for one or two years; 5, wheat, on once ploughing; 6, oats, peas, or beans; 7, ſainfoin. In the Chiltern diſtrict the courſe is nearly ſimilar: 1, turnips; 2, barley; 3, clover, or trefoil and ray-graſs; 4, wheat, and 5, oats, barley, peas, or vetches. Among the crops only partially cultivated here are lentils, rape, cabbages, carrots, potatoes and chicory. Rhubarb is ſtill alſo grown near Drayton, but the culture of hemp, flax, and hops, (all of which uſed to be raiſed in conſiderable quantities,) is now almoſt entirely neglected.

From the number of its rivers Oxfordſhire abounds in meadows and paſtures; but theſe are no longer, as in the time of Gibſon, the "greateſt glory" of the county, being much circumſcribed by the encroachments of arable cultivation. A large tract of meadow land, on the banks of the Charwell, has been greatly injured by the conſtruction of the canal from Oxford to Banbury. At Water Eaton is the beſt graſs land in the county. It is under-dairies which indeed conſtitute the appropriation of moſt of the meadow and paſture grounds in Oxfordſhire. Butter is the chief article made, only a ſmall proportion of cheeſe being made for ſale. The long horned breed of cows is that generally preferred here. In the middle parts of the county a few oxen, cows and ſheep are fatted; and a number of calves are ſuckled for the London market. No watered meadows are found in Oxfordſhire, though many places are extremely well adapted for their formation.

*Foreſts, Woods, and Plantations.*—Oxfordſhire is ſaid by Camden to have been anciently famous for its woods; and even at preſent, except in the more northerly parts, it is better ſupplied with trees than moſt other counties of England. The only foreſt, however, within its boundaries, is that of Whichwood, which comprehends 6720 acres, 1 rood, and 39 poles. In this foreſt, the oak, the aſh, the beech, and the elm, are intermixed; but the oak is moſt abundant and thriving, and, in the courſe of half a century's growth, will be perfectly fitted for naval purpoſes. The Chiltern diſtrict is profuſely covered with beech, produced almoſt entirely by the falling of the beech maſt, very little being permitted to grow on the old ſtools. Some have ſuppoſed this diviſion of the county formed part of the great foreſt, deſcribed by Leland as ſtretching 120 miles weſtward from the borders of Kent. This opinion, however, is merely conjectural, though in ſome degree plauſible.

The other principal wood-lands in this county are thoſe at Stanton-St.-John, called the "Quarters," and at Blenheim, the ſeat of the duke of Marlborough. Smaller plantations are numerous: almoſt every gentleman's ſeat in Oxfordſhire being more or leſs ſurrounded with trees of different ages and ſorts.

*Waſte Lands.*—The only tracts of waſte land, of any very conſiderable extent, are thoſe ſituated in the purlieus of Whichwood-foreſt, and the deanery diſtrict, termed Ottmoor, which lies in the vicinity of Iſlip. The laſt, which contains about 4000 acres, is commonable to eight adjoining townſhips. The whole of it is extremely flat and wet, and conſequently unwholeſome to cattle, as well as prejudicial to the neighbourhood. The ſoil, however, is good, and if drained, (which might be eaſily effected,) and incloſed, would undoubtedly prove highly amenable to the purpoſes of agriculture. The value of the grounds would thereby increaſe to probably ten times their preſent amount. The ſame may be ſaid of the waſte lands of Whichwood, and of the ſmall commons in the northern diſtrict; but thoſe in the Chiltern diviſion are not ſuſceptible of much culture.

*Roads and Canals.*—The roads of Oxfordſhire, till within theſe laſt few years, were deplorably bad. Young, in his "View of the Agriculture" of this county, obſerves that, 40 years ago, "the high roads were in a condition formidable to the bones of all who travelled on wheels." The ſame writer alſo characteriſes the croſs roads as impaſſable at that period, without real danger. Now, however, a great improvement has taken place: good turnpike roads interſect the county in the direction of all its market-towns, and the greater part of the parochial and croſs-ways are improved in a proportional degeee.

The only *canal* yet cut through any portion of Oxfordſhire is that which enters the county at its northern extremity, between Claydon and the Three-ſhire-ſtone. "Approaching the vicinage of the river Charwell at Cropredy, it proceeds at a ſmall diſtance from the banks of that river to the city of Oxford, (whence it is called the Oxford canal,) where its channel terminates, and is ſucceeded by the navigation of the Iſis." The probable advantages which will accrue from this cut are very great, as a direct water communication has been thereby opened between the interior of the county, and Birmingham, Liverpool, Mancheſter, and the Wedneſbury collieries, as well as with the cities of London and Briſtol.

*Civil and Eccleſiaſtical Diviſions.*—Oxfordſhire is divided into fourteen hundreds, which together contain 1 city, 12 market-towns, and 207 townſhips and pariſhes, all of them in the dioceſe of Oxford, and province of Canterbury. According to the parliamentary returns of 1811, the number of houſes in the whole county was 23,217, and the number of inhabitants 119,191. In 1801, the houſes were eſtimated at 20,599, and the population at 109,620 perſons. Oxfordſhire is repreſented in parliament by nine members; two knights of the ſhire, two citizens for Oxford, two repreſentatives for the Univerſity, two burgeſſes for Woodſtock, and one for Banbury.

*Manufactures.*—Hitherto, at leaſt, Oxfordſhire has had little claim to be ranked among the number of the manufacturing counties of England. Its articles of manufactured produce are neither numerous nor of great importance. Witney blankets, indeed, were formerly much noted; but this branch of trade is now declined, and the town is reduced to a comparatively poor and deſtitute condition: for though the introduction of machinery has revived, in a ſmall degree, the buſineſs of the maſters, that circumſtance has not contributed to the benefit of the labouring poor. At Woodſtock is a ſmall manufacture of poliſhed ſteel articles, which was introduced by a Mr. Medcalfe, and was at one time in a very flouriſhing ſtate. Here is likewiſe a manufacture of leather breeches and of gloves, which employs about 70 men, and 1400 or 1500 women and girls. The wages of the men are from one guinea to 30*s.* weekly, and thoſe of the women from 8*s.* to 12*s.* *per* week. A ſmall quantity of lace is made in the town and neighbourhood of Thame; and at Bloxham and Banbury a coarſe ſort of velvet is produced. Henley has, for ſeveral centuries, been one of the London depots for malt.

*Antiquities.*—Oxfordſhire certainly does not offer ſuch a field for antiquarian reſearch as many other counties; but, nevertheleſs, it affords ſome materials in this branch of inquiry, by no means unworthy of attention. Several very curious Britiſh coins have been found within its limits, and

there

there are numerous barrows and other monuments here, which, we preſume, may properly be referred to an era antecedent to the records of hiſtory. Of this deſcription is the Druidical monument, called *Rollrich*, or *Rowlright Stones*, which were originally 60 in number, (though only 22 of them are now ſtanding,) and formed a circle nearly equal in diameter to the outer one at Stonehenge. The ſizes of theſe ſtones, however, are trifling, compared to the immenſe maſſes of the Wiltſhire temple, few of them exceeding four feet in height, and ſixteen inches in breadth. One only, in the northern part of the circle, is ſeven feet high, and five and a half broad; but detached is another, meaſuring eight feet in height, and ſeven in breadth. This laſt is denominated the King-ſtone, from a tradition that ſome ancient monarch and his court were converted into ſtones on this ſpot. Contiguous to it is a large long barrow, ſuppoſed to contain the aſhes of an arch-druid; and near it is a ſquare entrenchment, with a double ditch and vallum, having ſome remains of ſtone-work in its interior. Theſe Dr. Stukeley calls Druid-courts, or houſes. Several other barrows, with the apparent foundations of buildings cloſe to them, are diſcovered in the vicinity of this temple; and about 300 paces from it was formerly a kiſtvaen of ſix ſtones, which have been lately removed. See KISTVAEN.

Owing to the continued amity which exiſted between the inhabitants of this diſtrict and the Romans, the relics of Roman military poſſeſſion are few. No doubt, however, that celebrated people had ſeveral ſtations in Oxfordſhire, of which the principal was at Aldcheſter or Alceſter. Dorcheſter and Swalcliff are likewiſe ſuppoſed to have been Roman towns, or poſts, of conſiderable importance. Coins of the emperors, and fragments of teſſellated pavement, are frequently dug up, and there are a few ſmall encampments and funeral mounds diſperſed throughout the county, which are alſo probably of Roman origin. Of theſe laſt, the moſt remarkable is that termed Aſtal barrow, which borders on the Old Akeman road, and which is conjectured by Dr. Plot to be the ſepulchre of ſome diſtinguiſhed leader, on account of its uncommon height and circumference. Of the four principal Roman roads interſecting the iſland, one only paſſes through Oxfordſhire. This is the Ikenild-ſtreet, which enters the county at the pariſh of Goring, and croſſes it in a direction from ſouth-weſt to north-eaſt by Iſpden, Ewelm, Watlington, and Crowell, to Chinnor, where it enters Buckinghamſhire. Vicinal ways, however, are abundant. The Akeman ſtreet ſtretches itſelf throughout the broadeſt part of the county, entering it near Holywell, and leaving near Ambroſden, in the vicinity of the ſtation Alceſter. From this ſtreet many minor roads branch off in different directions. Two of theſe are traced near Kirklington, a third within Blenheim-park, and a fourth to the ſouth of Biceſter. Between Mongewell and Nuffield is a vallum, or high ridgeway, called Grimes-dyke, or Devil's-ditch, alſo numbered by Dr. Plot among the Roman vicinal ways, but we are inclined to refer it to a more remote era. This embankment is ſtill very high, and has in ſome places a ſingle, and in others a double agger.

The moſt eminent places in the county, during the government of the Saxons and Danes, were Banbury, Benſington, Birenceſter or Biceſter, Burford, Thame, Chipping-Norton, Bampton, Woodſtock, and Iſlip. The two laſt were royal vills. King Edward the Confeſſor was born at Iſlip; and Woodſtock afterwards became famous as a palace of the monarchs of the Norman dynaſty. Several Saxon and Daniſh encampments may likewiſe be traced within the limits of this county, particularly at Caſtleton, Adwell, and Chipping-Norton.

After the Conqueſt, king William ordered a number of caſtles to he erected in this county, as in moſt others in England, with the view of enſuring the ſubmiſſion of his new ſubjects. Of theſe fortreſſes, the principal in Oxfordſhire were the caſtles of Oxford, Bampton, Banbury, Deddington, Ardley, and Middleton, all of which were places of great ſtrength, and ſtill retain marks of their former extent and conſequence as military poſitions. A few fortifications of a much later period are alſo met with in different diſtricts of the county.

As a ſubject of antiquities, we ſhall conclude this article with a ſhort liſt of the various religious houſes which have exiſted in Oxfordſhire, whether before or ſince the arrival of the Normans, excepting only thoſe already mentioned in our deſcription of Oxford. They are as follow:

1. A college at Banbury, dedicated to St. Mary, and endowed with 48*l.* 6*s.* *per annum.*

2. An hoſpital in the ſame town, dedicated to St. John, for the reception of lepers.

3. A Ciſtercian abbey at Bruerne, founded by Nicholas Baſſet, A. D. 1147.

4. A monaſtery for Auſtin canons at Biceſter, founded by Gilbert Baſſet, baron of Hedingdon, A. D. 1182.

5. An hoſpital, at the ſame place, founded A. D. 1355.

6. An hoſpital, or priory, at Burford, dedicated to St. John.

7. An Auſtin cell to the abbey of Nottely, at Caverſham.

8. An alien priory, at Charlton, cell to the abbey of St. Ebrulf at Utica, in Normandy.

9. A Gilbertine priory at Clattercote, dedicated to St. Leonard. It was for ſome time an hoſpital for lepers.

10. An alien priory of Black monks at Cogges, cell to the abbey of the Holy Trinity at Fiſchamp in Normandy. It was founded about the year 1100.

11. An hoſpital at Crowmarſh, founded for ſick brethren, A. D. 1248.

12. The cathedral church at Dorcheſter, was eſtabliſhed about the year 635, by Birinus, firſt biſhop of that ſee.

13. An abbey for black canons of the order of St. Auguſtine, at the ſame place, founded by Alexander, biſhop of Lincoln, A. D. 1140.

14. A Benedictine abbey at Eynſham, built and endowed by Ailmer, earl of Cornwall, before A. D. 1005.—Reſtored by Robert Bloet, biſhop of Lincoln, in the reign of Henry I.

15. An hoſpital at Ewelme, founded and endowed by William de la Pole, earl of Suffolk, for two chaplains and thirteen poor men. A. D. 1437.

16. A Benedictine nunnery at Godſtow, built A. D. 1138, by Editha or Ediva, a religious matron, aſſiſted by the contributions of other pious perſons. The conſecration of this abbey was performed in the preſence of king Stephen, his queen, and a vaſt concourſe of prelates and nobility. The celebrated Roſamund Clifford, miſtreſs to Henry II. was buried here.

17. A priory of nuns of the order of St. Auſtin, at Goring, founded temp. Hen. II.

18. A houſe for ſiſters of the order of St. John of Jeruſalem, at Gosford, founded ſoon after the Conqueſt; but removed in 1180.

19. A priory of Benedictine nuns at Littlemore, founded temp. Hen. II. Suppreſſed and given to cardinal Wolſey, A. D. 1524.

20. An alien priory of Benedictines at Minſter Lovel, a cell to the abbey of St. Mary de Ibreio, or Iri.

21. A Bene-

21. A Benedictine cell at Milton to the monaſtery of Abbington.

22. An Auſtin priory at Norton, built by William Fitz-Alan the ſecond, temp. Hen. II.

23. A houſe for knights templars at Saundford, founded about temp. Stephen.

24. A Benedictine nunnery at Stodley, built and endowed by Bernard de Walerico, in the reign of Henry II.

25. A Ciſtercian abbey at Thame. This ſociety was originally founded at Otteley, in the pariſh of Oddington, by ſir Robert Gait, but was ſhortly after removed hither. Alexander, biſhop of Lincoln, gave the ground on which this monaſtery was built, A. D. 1137.

26. An hoſpital alſo in this town, founded by Richard Quatermain, either in the reign of Henry VI., or of king Edward IV.

27. A houſe of Trinitarian friars at Thuſfield, or Thuffield, founded before 33 Edw. III.

28. An hoſpital of St. Mary in Woodſtock.

29. A priory of Auſtin canons at Uroxton, founded in the beginning of the reign of king Henry III. by Michel Belet. Granted to ſir Thomas Pope. [Camden's Britannia, by Gough, 3 vols. folio. Beauties of England and Wales, vol. ix. by J. N. Brewer. Natural Hiſtory of Oxfordſhire, by Robert Plot, LL.D. Oxford, edit. 1677. Tanner's Notitia, fol. Magna Britannia. View of the Agriculture of Oxfordſhire, by Arthur Young, ſecretary to the Board of Agriculture, 8vo. London, 1809.]

OXGANG, or OXGATE *of Land*, is ordinarily taken, in our old law-books, for fifteen acres; being as much land as it is ſuppoſed one ox can plough in a year.

"Bovata terræ, *q. d.* quantum ſufficit ad iter vel actum unius bovis."

In Lincolnſhire they ſtill corruptly call it *oſkin* of land. This term is uſed in Scotland for a portion of arable land, containing thirteen acres.

OXHANGER, in *Geography*, a ſmall iſland on the E. ſide of the gulf of Bothnia. N. lat. 63° 19'. E. long. 21° 58'.

OX-HARROW, in *Agriculture*, a term applied to a very large ſort of harrow, called in ſome countries a drag.

OXIANA, in *Ancient Geography*, a town of Aſia, in Sogdiana, near the *Oxus*; which ſee.

OXIANA *Palus*, a marſh of Sogdiana, called by Pliny Oxus, from the name of the river of which it is the ſource.

OXIBII, a people of the Maritime Alps, between the river Argens and Antibes. Theſe people were powerful, and ſignalized themſelves againſt the Romans, when they undertook the conqueſt of the Gauls. They leagued with the Decialcs, for attacking the towns of Nice and Antibes. Steph. Byz. aſſigns to them a town called "Oxibium." Strabo mentions a port named "Oxibus" as belonging to them, ſuppoſed to be the ſame with the maritime town called by Polybius "Ægytna."

OXNA, in *Geography*, a ſmall iſland on the E. coaſt of Shetland. N. lat. 60° 8'. W. long. 1° 52'.

OXNAY, a river-iſland of England, in the county of Kent, formed by the divided ſtreams of the Rother, about ſeven miles long, and three broad, containing three pariſhes, and giving name to a hundred.

OX-SHOEING MACHINE, in *Agriculture*, a ſimple contrivance employed by Mr. Young, in executing the buſineſs of ſhoeing theſe animals. It is brought to the attention of the public, in the twenty-ſixth volume of his Annals, where he mentions that it is now almoſt twenty years that he has been in the habitual practice of uſing oxen for both plough and cart, and from the beginning was averſe from making any trials by *caſting* them for ſhoeing. The late lord Nugent uſed many at Goſfield, in Eſſex, and from his machine for this purpoſe, he took the idea of his preſent one, which is repreſented in the *Plate Ox-Shoeing* (*Agriculture.*) *figs.* 1 and 2; but the ſtumps for the fore-legs, and the moveable roller for the hind ones, he has added ſince, as well as altered the head apparatus, and added the hinder ſtrap.

*a*, is the top-piece of the ſliding-plank, to ſink down and confine the head.

*b*, *b*, are broad ſtrong ſtraps of leather, faſtened by links of iron, to prevent the ox from lying down on his belly, which they are apt to do; and the hinder ſtrap is to prevent his drawing back to the injury of his head and neck.

*c*, *c*, are two ſtumps, ſtrongly fixed in the ground, to tie the fore-legs to.

*d d*, is an iron that lets up and down, to confine the roller to which the hinder legs are tied for ſhoeing.

*e*, *e*, *e*, are holes (with others correſponding not ſeen in the plate) for the roller to be ſhifted according to the length of the ox.

It is ſuggeſted that the whole is ſo ſimple, that it is preſumed any country carpenter may be able to build it without any difficulty, from inſpecting the plate.

And it is well remarked that the ſhoeing of oxen is generally ſo ill done, that the ſhoes are perpetually coming off, which is a great objection and expence. And he has never had a blackſmith that did it well, ſo that upon land not flinty or gravelly, he ſhould not ſhoe at all, if they did not go upon the high roads. Whatever improvement can, by any means, facilitate the uſe of oxen in huſbandry, deſerves much attention, the importance of ſubſtituting them for horſes riſing with the price of meat, and it is with that view he has inſerted this plate and explanation. See SHOEING *Oxen*.

OXUCIÆ, in *Natural Hiſtory*, the name of a genus of foſſils of the claſs of the ſelenitæ, but of the columnar, not the rhomboidal kind.

The word is derived from the Greek ὀξυς, *ſharp*, and κιων, a *column*; and expreſſes a body of a columnar form, and pointed or ſharp at the ends.

The ſelenitæ of this genus conſiſt of ſix equal planes, having their top or bottom no broader or more depreſſed than the others; and in this differing from the *iſchnambluces*, or flatted columnar ſelenitæ, as they do from the *iſambluces*, or *cryſtalliform*, but broken ended ones, by having their ends naturally tapering off to a point.

The bodies of this genus, like thoſe of the other genera of the columnar ſelenitæ, are liable to a longitudinal crack in their middle; and this ſometimes includes a little clay, in the form of an ear of graſs. See SELENITÆ.

Of this genus there are only two known ſpecies.

OXUS, GIHON, *Jihon*, or *Amu*, in *Ancient Geography*, a large river of Aſia, which took its riſe in the mountains of Bactriana, to the S.E. In purſuing its courſe towards the N.W., it traverſed this province, paſſed between Aria to the weſt, and Sogdiana to the eaſt; and afterwards entering into the territory of the Khoraſmii, diſcharged itſelf into the lake called the lake of Aral. See AMU.

OXWICH, in *Geography*, a ſea-port and pariſh in the cwmwd of Gwyr, cantref of Eginog (now called the hundred of Swanſea) and county of Glamorgan, South Wales, is ſituated on a ſmall promontory, to which it gives name, on the north coaſt of the Briſtol channel, at the diſtance of thirteen miles from Swanſea. A conſiderable trade in limeſtone is carried on here, and gives employment to a number of people in the vicinity. The ſea has made great encroachments on this pariſh, and is even ſuppoſed to have inundated

inundated the whole of the original village, as the old church and parſonage-houſe ſtand cloſe to the ſhore, and the preſent village is built at ſome diſtance inland. Here are the remains of a large manſion, called Oxwich caſtle, which was erected by ſir Rice Manſel, about the reign of Henry VIII. This edifice never appears to have been intended for the purpoſes of defence, but it may not unlikely have been built on the ſcite of an ancient fortreſs, as only a few yards from it there are ſtill to be ſeen the remains of a watch-tower of much older and ſtronger conſtruction. Part of this caſtle was converted, many years ago, into a farm-houſe. Lobſters and crabs are caught in great plenty along the whole coaſt of this pariſh, which, according to the parliamentary returns of 1811, contains 50 houſes, and 236 inhabitants.

Penrice-caſtle ſtands about three miles from Oxwich. It derived its name from the family of the Penrices, who ſettled here in the reign of Edward I., but is now the property of the Talbots. This demeſne has lately been amazingly improved, and exhibits a diverſity and richneſs of ſcenery altogether unexpected from the dreary appearance of the ſurrounding country. In the avenue to the gardens is a fine tomb of one of the emperors, which was brought from Italy. The village of Penrice has a good harbour for ſhipping.

North from this place, upon a mountain called Com-Bryn, is a table-like monument, or cromlech, called Arthur's ſtone. It conſiſts of ſix or ſeven ſtones, about five feet in height, ſupporting a large flat ſtone, ſuppoſed to weigh nearly 20 tons. A ſpring iſſues from beneath, which ebbs and flows with the tide, and is celebrated as "Ffynnon Vair, or my Lady's Well." Carliſle's Topographical Dictionary of Wales, 4to. 1811.

Oxwich *Point*, a cape on the ſouth coaſt of Wales, in the Britiſh channel, forming the eaſtern boundary of a bay called "Oxwich bay." N. lat. 51° 27'. W. long. 4° 6'.

OXYA, in *Botany*, a name by which many authors, eſpecially the Greeks, have called the *fagus*, or beech-tree.

OXYBAPHUS, a name contrived, as it ſeems, by L'Heritier, in one of thoſe rare monographs, of which we have mentioned ſix in our article on his life; ſee Heritier. But *Oxybaphus* and *Tricratus* are cited by Willdenow, Sp. Pl. v. 1. 185 and 187, though not to be found in the catalogue of L'Heritier's own library, nor in that of ſir Joſeph Banks. This countenances Cuvier's aſſertion, that none of his friends had all theſe diſſertations; but we cannot account for his not having had them all himſelf, and it is not impoſſible that he might merely inform Willdenow by letter of the intended preparation of theſe two. Vahl indeed quotes the monograph on the genus before us, but he might copy Willdenow. The above generic name is evidently formed from οξυς, *four*, or *ſharp*, and βαφευς, *a dyer*; but whether the viſcidity which covers the original ſpecies be of an acid or acrid quality, or not, no author within our reach has related, ſo that our explication is but imperfect. —Willd. Sp. Pl. v. 1. 185. Vahl. Enum. v. 2. 39. Mart. Mill. Dict. v. 2. Ait. Hort. Kew. ed. 2. v. 1. 77. (Calyxhymenia; Fl. Peruv. v. 1. 45.)—Claſs and order, *Triandria Monogynia*. Nat. Ord. *Nyctagines*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, bell-ſhaped, with five folds, and five broad, equal, ſhallow ſegments, permanent, ſometimes three-flowered. *Cor.* of one petal, funnel-ſhaped; tube about the length of the calyx; limb ſpreading, in five equal, notched lobes. Nectary fleſhy, furrounding the baſe of the germen. *Stam.* Filaments three, inſerted into the nectary, thread-ſhaped, declining, rather unequal, various in length; anthers roundiſh, aſcending. *Piſt.* Germen ſomewhat ſtalked, ſuperior, roundiſh, furrowed; ſtyle thread-ſhaped, the length and poſition of the ſtamens; ſtigma globoſe, aſcending. *Peric.* none, except the permanent hardened baſe of the corolla. *Seed* ſolitary, ovate, with five angles, ſtanding upon the dilated, ſpreading, permanent calyx.

Eſſ. Ch. Calyx five-cleft, bell-ſhaped. Corolla funnel-ſhaped. Seed ſolitary, coated, ſtanding on the ſpreading permanent calyx.

Obſ. This genus is ſeparated from *Mirabilis*, on account of its ſhort tube, lobed limb, three inſtead of five ſtamens, and calyx much dilated after flowering. The plants which compoſe it have an herbaceous, branched, round *ſtem*, ſtalked, oppoſite, ſlightly undulated *leaves*, one of them ſmaller than its companion. The herbage is moſtly viſcid and downy, and of a diſagreeable odour. The *ſtamens* are ſaid occaſionally to vary to four.

1. O. *viſcoſus*. Viſcid Umbrella-wort. Curt. Mag. t. 434. (Mirabilis viſcoſa; Cavan. Ic. v. 1. 13. t. 19.)—Downy and viſcid. Leaves heart-ſhaped. Panicle racemoſe. Stamens longer than the corolla. Native of Peru, from whence it was ſent, about twenty-five years ago, to the royal garden at Madrid, and thence communicated to various other collections. *Root* perennial, but uſually treated as annual, like the Marvels of Peru. Whole plant covered with jointed, glandular, viſcid hairs. *Stem* two feet, or much more, in height, erect, with oppoſite ſpreading branches. *Leaves* wavy, bluntly pointed, thickiſh, but ſoft and pliant, like thoſe of *Mirabilis longiflora*. *Panicle* branched, viſcid, many-flowered, its branches beſet with whorls and ſhort cluſters of ſmall purpliſh *flowers*, the lobes of whoſe *corolla* are inverſely heart-ſhaped, and much ſhorter than the *ſtamens* and *ſtyle*. *Calyx* of the fruit pendulous, membranous, pallid, reticulated with veins. *Seed* leſs than a grain of wheat, with five tuberculated angles, dropping out of the calyx when ripe.

2. O. *glabrifolius*. Smooth-leaved Umbrella-wort. Vahl. n. 2. (Calyxhymenia glabriſolia; Orteg. Decad. 5. t. 1. Mirabilis corymboſa; Cavan. Ic. v. 4. 55. t. 379.)—Leaves heart-ſhaped, glaucous, ſmooth. Panicle corymboſe. Flowers in terminal tufts. Stamens ſhorter than the corolla. Native of Peru and New Spain. Cultivated at Madrid. Ortega deſcribes this as a glaucous plant, with the acrid flavour of a *Sedum*; glandular and villous when young, but nearly ſmooth when full-grown. *Leaves* acute, entire, rough with reverſed hairs at the edges. *Panicle* hairy, forked, corymboſe. *Flowers* ſmall, purple, in tufts at the top of each branch of the panicle. *Calyx* tipped with red.

3. O. *ovatus*. Ovate Umbrella-wort. Vahl. n. 3. (Calyxhymenia ovata; Fl. Peruv. v. 1. 45. t. 75. f. *b*. *Vahl.*)—Hairy and viſcid. Leaves ovate. Flower-ſtalks terminal, forked. Stamens nearly as long as the corolla. Stem erect. —Native of elevated ſpots in Peru.—*Stem* three feet high. *Plant* clothed with jointed, glandular, viſcid hairs. *Leaves* thick and veiny, acute, entire, rough-edged. *Panicle* forked, with ſolitary ſingle-flowered ſtalks. *Corolla* red, twice as large as the *calyx*, till the latter becomes dilated and membranous as the fruit advances. This is known only from the *Flora Peruviana*, as well as the two next.

4. O. *proſtratus*. Proſtrate Umbrella-wort. Vahl. n. 4. (Calyxhymenia proſtrata; Fl. Peruv. v. 1. 46. t. 75. f. *c*. *Vahl.*)—Leaves ovate or heart-ſhaped, downy. Flowers axillary and terminal, ſomewhat corymboſe. Stem proſtrate. —Native of hills in Peru.—*Stem* three feet long, ſtriated, ſlightly downy; branches alternate, forked in the upper part. *Leaves* ſlightly crenate, wavy, veiny. *Flower-ſtalks* from the forks of the branches, as well as terminal, or axillary, ſhort, glandular, bearing from three to eight *flowers* on little

partial ſtalks. Segments of the *calyx* ovate. *Corolla* purple, thrice as long, plaited. *Vahl.*

5. O. *expanſus*. Spreading Umbrella-wort. Vahl. n. 5. (Calyxhymenia expanſa; Fl. Peruv. v. 1. 45. t. 75. f. *a. Vahl.*)—Leaves ovate, ſmooth. Flower-ſtalks terminal, forked. Stamens the length of the corolla. Stem erect.—Found on very dry hills in Lima.—*Stem* ſix feet high, ſtriated. *Leaves* diſtant, obſcurely crenate, rather wavy, acute, veiny; the floral ones nearly ſeſſile. *Flower-ſtalks* terminal, forked in a corymboſe manner, bearing from ſix to eleven flowers, on unequal partial ſtalks, which are but ſlightly viſcid. *Calyx* downy and glutinous. *Corolla* purple, ſomewhat bell-ſhaped. *Seed* obovate, rough *Vahl.*

6. O. *aggregatus*. Three-flowered Umbrella-wort. Vahl. n. 6. (Calyxhymenia aggregata; Orteg. Decad. 81. t. 11. Mirabilis aggregata; Cavan. Ic. v. 5. 22. t. 437.)—Leaves lanceolate. Flower-ſtalks axillary, ſolitary. Calyx with about three flowers.—Native of New Spain. It flowered in 1798 at Madrid.—*Stem* a foot high or more, branched from the very baſe, ſtriated, leafy. *Leaves* nearly ſeſſile, about two inches long, oppoſite, lanceolate, thickiſh, wavy, ſmooth, rough edged. *Flower-ſtalks* axillary, ſometimes from the forks of the branches, ſolitary, ſhort, drooping when in fruit. *Calyx* bell-ſhaped, with unequal ovate ſegments, containing uſually three *flowers*, rarely two or four, which are ſeſſile, without any other perianth. *Corolla* reddiſh. *Stamens* the length of the *corolla*. The *calyx* is enlarged when in fruit, as in the other ſpecies. *Seeds* ſeldom more than two perfected, large, villous, at firſt enveloped by the *calyx*, which at length becomes expanded.

OXYACANTHA. See BERBERIS.

OXYBLATTA, among the *Ancients*, is uſed to denote a bright and gloſſy kind of purple colour.

OXYCANI, in *Ancient Geography*, a people of India, who occupied the territory now called Hajycan or Hajykan, a circar or diviſion of Sindy.

OXYCEDRUS, in *Botany*. See JUNIPERUS.

OXYCOCCUS, from οξυς, *acid*, and κοκκος, *a berry*; the Cranberry. See VACCINIUM; from which ſome have diſjoined this plant, becauſe the *corolla* is very deeply divided, even to the very baſe; ſo that Roth, who has called this ſuppoſed new genus *Schollera*, deſcribes it as tetrapetalous. He alſo takes for additional characters the tubular points of the anthers, and the approximation of their filaments. The laſt is ſurely of little avail, and the former occurs in *Vaccinium ſtamineum*, whoſe *corolla*, nevertheleſs, is perfectly monopetalous; as well as probably in many other ſpecies; theſe organs being variouſly conſtructed in that genus, like thoſe of its relation *Erica*. Linnæus had long ago conſidered this matter, and he aſſerts in *Flo. Lapp.* ed. 2. 118, that "the great Tournefort was wonderfully deceived in conſidering the Cranberry as polypetalous; for if the flower be examined at its firſt opening, it will be found monopetalous, ſlightly four-cleft at the margin, though it ſubſequently ſplits, and falls off in four parts." Did Dr. Roth eſtabliſh his genus without conſidering this paſſage? He does not cite the work. See *Roth Germ.* v. 1. 170. v. 2. 442. We have only to add, that if this genus were eſtabliſhed, *Oxycoccus* muſt remain with it, as an unexceptionable name.

OXYCRATE, OXYCRATUM, οξυκρατον, formed of οξυς, *ſharp, ſour*, and κεραννυμι, *I mix*, in *Pharmacy*, &c. a mixture of water and vinegar.

The uſual proportion is one ſpoonful of vinegar to five or ſix of water.

Oxycrate is proper to aſſuage, cool, and refreſh. They make fomentations of oxycrate, clyſters of oxycrate, &c.

OXYCROCEUM, formed from οξυς, *ſharp, ſour*, and κροκος, *ſaffron*, a preparation uſed in plaſters for fractures, and to form calluſes; compoſed chiefly of ſaffron, with gums diſſolved in vinegar.

OXYD, or OXIDE, in *Chemiſtry*, a term that may be properly applied to any ſubſtances chemically combined with oxygen; but it is reſtricted to thoſe that have not acquired acid properties by the combination. This term is chiefly uſed to expreſs thoſe modifications of metallic bodies formerly termed "calces." See CALCINATION.

For the oxyds of antimony, arſenic, iron, lead, mercury, &c. ſee the ſeveral articles.

OXYDRACÆ, in *Ancient Geography*, a people of India, who inhabited the diſtrict now called Outch, near the confluence of the Aceſines (Chunaub) with the Indus.

OXYGALA, οξυγαλα, formed from οξυς, *ſharp, ſour*, and γαλα, *milk*, ſour milk.

The Turks uſe this as a popular drink, and call it *igur*. Vigenere ſays, they drink ſour milk diluted with water; which is found to cool and nouriſh better than the milk alone.

OXYGARUM, a word uſed by the ancients to expreſs a mixture of vinegar and garum, which is a pickle for preſerving fiſh, or a ſimple mixture of ſea-ſalt and water.

OXYGEN GAS, French nomenclature; *Dephlogiſticated air* of Dr. Prieſtley; *Empyreal and vital air* of others.

This important element is very generally diffuſed throughout nature. It exiſts in the atmoſphere, and in water; it is often found in combination with metallic baſes, and it conſtitutes one of the ultimate principles of almoſt all animal and vegetable matter. It is eſſential to the reſpiration of animals, and is frequently abſorbed by plants, contributing to the healthy performance of ſome of their moſt intricate functions.

Oxygen gas was diſcovered by Dr. Prieſtley in the month of Auguſt 1774. He obtained it by heating *red precipitate* in a ſmall glaſs retort connected with the hydro-pneumatic apparatus. This compound of quickſilver and oxygen is decompoſed at a low red heat, the quickſilver diſtils over, and the oxygen aſſumes the gaſeous form. In conſequence of properties preſently to be noticed, Dr. Prieſtley termed it *dephlogiſticated air*. While theſe experiments were carrying on in England, Scheele, in Sweden, was engaged in inveſtigating the nature of the ores of manganeſe, and in the courſe of the year 1775, he procured oxygen gas without any previous knowledge of Prieſtley's diſcovery.

Lavoiſier, in his "Elements of Chemiſtry," Engliſh tranſlation, p. 36. v. 1. ſays, "this ſpecies of air" (meaning oxygen) "was diſcovered about the ſame time by Mr. Prieſtley, Mr. Scheele, and myſelf." In a pamphlet publiſhed in 1800 by Dr. Prieſtley, after his return to America, entitled "The Doctrine of Phlogiſton eſtabliſhed, and that of the Compoſition of Water refuted," there is the following remark upon the ſubject of this brilliant and important diſcovery, which we tranſcribe without comment. "The caſe was this. Having made the diſcovery ſome time before I was in Paris in the year 1774, I mentioned it at the table of Mr. Lavoiſier, when moſt of the philoſophical people in the city were preſent, ſaying, that it was a kind of air in which a candle burned much better than in common air, but I had not then given it any name. At this all the company, and Mr. and Madame Lavoiſier, as much as any, expreſſed great ſurpriſe. I told them I had gotten it from *precipitate per ſe*, and alſo from *red lead*. Speaking French very imperfectly, and being little acquainted with the terms of chemiſtry, I ſaid *plomb rouge*, which was not underſtood till Mr. Macquer ſaid, I muſt mean *minium*. Mr. Scheele's diſcovery

diſcovery was certainly independent of mine, though I believe not made quite ſo early."

Oxygen gas may be procured from a variety of ſources, but two only are generally had recourſe to. For delicate inveſtigations, where it is required to be abſolutely pure, it may be obtained by heating the compound termed *oxymuriate of potaſh*. One hundred grains of this ſalt, at a low red heat, yield from 100 to 110 cubical inches of oxygen in a ſtate of great purity. For all the common purpoſes of experiment, however, it may be procured by heating to redneſs in an earthen or iron retort, the ſubſtance called *black oxide of manganeſe*, of which one pound in fine powder affords about 1400 cubic inches of tolerably pure oxygen gas. This oxyd of manganeſe is a very abundant article; it ſhould be purchaſed in lumps, for when powdered, it is apt to be mixed with extraneous matter, which interferes with the production of pure oxygen; indeed, the firſt portions which paſs off are rarely pure, and ſhould be collected in a ſmall tube, and teſted by the introduction of an inflamed taper; if this burns with greatly increaſed brilliancy, the oxygen may be regarded as ſufficiently free from impurities. Nitrate of potaſh or ſaltpetre, minium, or red oxyd of lead, and ſeveral other ſubſtances containing oxygen, afford it when heated to redneſs.

Oxygen may alſo be obtained by mixing the oxyd of manganeſe in a glaſs retort, with its weight of ſulphuric acid (oil of vitriol); the heat of a patent lamp will then be ſufficient to cauſe a copious evolution of the gas; there are, however, ſome black oxyds of manganeſe which evolve an abundance of the gas at a red heat, but yield it ſparingly when acted upon by the acid; and *vice verſâ*. The cauſe of this has not been explained.

In all the above experiments, the manganeſe only loſes a *portion* of its oxygen, the remainder being retained in combination with the metal by a very powerful attraction. The oxyd, after expoſure to a red heat till it gives off no more gas, acquires a brown colour, and if it be moiſtened and expoſed to the atmoſphere, it is ſuſceptible of abſorbing oxygen, and may thus be again uſed as a ſource of the gas; it may alſo be uſed to procure *chlorine*. See OXYMURIATIC *Acid*.

The only foreign matter contained in the gas, derived from oxymuriate of potaſh, is a little aqueous vapour, from which it may be freed by expoſure to cauſtic potaſh, or to fuſed muriate of lime; one or other of theſe ſubſtances may be introduced into the gas over quickſilver, and retained there until the whole of the moiſture is abſorbed, which is known by the freſh pieces of the ſubſtance remaining dry; the gas is then decanted into another veſſel, and may be regarded as perfectly pure. In this ſtate it exhibits the following characteriſtic properties.

It is permanently elaſtic at all known temperatures; colourleſs, tranſparent, and without ſmell and taſte.

It is reſpirable, and may be breathed for ſome time without inconvenience.

Its ſpecific gravity, compared to atmoſpheric air, is as 1003 to 1000; to hydrogen as 15 to 1. At a mean temperature and preſſure, 100 cubic inches weigh 34 grains.

When an inflamed taper is immerſed in oxygen gas, it burns with greatly increaſed ſplendour, and is much more rapidly conſumed than in atmoſpheric air; and when the wick is merely glowing, it is inſtantly rekindled with a ſlight exploſion. When ſteel or iron wire, with a bit of inflamed wood attached to it, is introduced into the gas, the metal burns with great brilliancy, and throws off white hot ſparks and globules, conſiſting of the protoxyd of iron. When ſulphur, phoſphorus, or charcoal, are burned in oxygen, the combuſtion is intenſely vivid, and *acids* are formed by the union of the two bodies. This circumſtance induced the French chemiſts to introduce the term *oxygen* (from ὀξυς), and they regarded it as a neceſſary component part of all acids; but the extenſion of experiment has ſhewn that this is far from true; and in many inſtances the abſorption of oxygen gives riſe to alkaline and earthy products, ſo that the term is very objectionable.

Conceiving that ſo powerful a ſupporter of combuſtion as this gas muſt in itſelf contain little or no phlogiſton, Dr. Prieſtley termed it *dephlogiſticated air*. See COMBUSTION.

The French theoriſts conſidered oxygen as neceſſarily preſent in all caſes of combuſtion, under which article will be found a detailed account of the ſubject; but experiment does not ſupport the concluſion, and there are abundant inſtances of combuſtion, not merely where no oxygen gas is preſent, but where ſolids and fluids act upon each other, independent of the abſorption or decompoſition of any aeriform matter. See OXYMURIATIC *Gas*.

Oxygen gas is very ſparingly abſorbed by water; when that fluid has been deprived, by boiling, of the atmoſpheric air which it contains, it takes up $\frac{1}{27}$th its bulk of oxygen, at the temperature of 60°.

If the number repreſenting oxygen be deduced from the analyſis of water, (ſee HYDROGEN and WATER,) it will be 7.5, for that fluid is compoſed of one volume of hydrogen and half a volume of oxygen, and the weights of *equal* volumes of theſe gaſes are to each other as 1 to 15. Or if, to obviate the uſe of fractional parts, we regard water as compoſed of *two* proportions of hydrogen, and *one* of oxygen, the ſymbol of the latter gas will be 15; and water compoſed of 15 oxygen + 2 hydrogen, will be repreſented by the number 17, inſtead of 8.5, as in the former inſtance. B.

OXYGENATION, in *Agriculture*, the act of uniting oxygen with different ſubſtances; when it is combined with earthy materials, ſuch as mould, clay, &c. they are found from experience to be more proper for the nutrition and ſupport of different ſorts of vegetables as crops.

OXYGLUCA, a word uſed by the ancients to expreſs a liquor made of a mixture of honey, water, and vinegar. The common way of making it was by macerating the combs, after the honey was preſſed out, in water; and then adding a ſmall portion of vinegar, to give it a tartneſs. It was ſometimes made without the addition of the acid, and made a weaker ſort of mead, uſed as a common drink in hot weather. Galen ſays it was the ſame with the *aſomeli*.

OXYGONIUS, OXYGONOUS, formed of ὀξυς, and γωνη, *angle*, in *Geometry*, *acute-angled*; a figure conſiſting wholly of acute angles, or angles leſs than ninety degrees.

The word is chiefly applied to triangles, where the three angles are all acute, or leſs than ninety degrees each.

OXYLIPES, a word uſed by ſome authors as a name for bread, which has a mixture of vinegar in it; intended ſometimes for eating, ſometimes for medicinal uſes.

OXYLOBIUM, in *Botany*, from ὀξυς, *ſharp*, and λοβος, *a pod* or *legume*, alluding to the ſharp point or beak of that part. Andr. Repoſ. 492. Brown in Ait. Hort. Kew. v. 3. 9. Claſs and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, ſomewhat two-lipped, in five deep ſegments, without appendages; the three lower ones rather moſt deeply ſeparated. *Cor.* papilionaceous, of five petals; ſtandard roundiſh, broad, with a ſhort claw; wings obovate, a little ſhorter than the ſtandard, oblique at the baſe, with ſhort, linear claws; keel compreſſed, as long

as the wings, of two heart-ſhaped petals cohering at their ſummits, with two ſhort, linear, diſtinct claws. *Stam.* Filaments ten, awl-ſhaped, aſcending, all encloſed in the keel; anthers roundiſh. *Piſt.* Germen ovate; ſtyle awl-ſhaped, aſcending, permanent and finally hardened; ſtigma ſimple. *Peric.* Legume ovate, turgid, acute, of one cell. *Seeds* ſeveral, roundiſh-kidney-ſhaped, inſerted into the margin of each valve at the dorſal future.

Eſſ. Ch. Calyx deeply five-cleft, ſomewhat two-lipped. Corolla papilionaceous; keel compreſſed, nearly as long as the ſpreading ſtandard. Style aſcending. Stigma ſimple. Legume ovate, inflated, pointed, of one cell with ſeveral ſeeds.

1. O. *arboreſcens*. Tall Oxylobium. Ait. n. 1.—Leaves linear-lanceolate. Bracteas permanent, at the top of the flower-ſtalk. Corymbs denſe. Legume ſcarcely longer than the calyx.—Found by Mr. Brown, in Van Diemen's land; brought to Kew garden in 1805, where it flowers from April to June, and is kept in the greenhouſe. The *ſtem* is ſhrubby or arboreſcent. Nothing further is, as yet, recorded of this ſpecies, nor have we ever ſeen a ſpecimen.

2. O. *ellipticum*. Oval-leaved Oxylobium. Ait. n. 2. (Gompholobium ellipticum; Labillard. Nov. Holl. v. 1. 107. t. 135. Calliſtachys elliptica; Vent. Malmaiſ. 115, b. Calliſtachya elliptica; Sm. Tr. of Linn. Soc. v. 9. 266.)—Leaves elliptic-oblong. Bracteas below the top of the flower-ſtalk, deciduous. Corymbs denſe. Legumes twice the length of the calyx.—Diſcovered firſt by the late Mr. David Nelſon, in Van Diemen's land, from whence it was brought to Kew by Mr. Brown, in 1805. It is kept in the greenhouſe, and flowers moſt part of the ſummer. Ventenat, having never ſeen the fructification, referred the plant by its habit to his *Calliſtachys*, but proves to be miſtaken. We know it only by Mr. Brown's ſpecific character; and the plate and deſcription of Labillardiere, according to whom the *ſtem* is ſhrubby, nine feet high, with upright ſilky branches that are ſometimes whorled. *Leaves* imperfectly whorled, near an inch long, on ſhort ſtalks, elliptical, entire, revolute, ſilky beneath, tipped with a ſmall point. *Stipulas* none. *Flowers* numerous, in denſe, ſhort, ſilky corymbs. We preſume the *corolla* is yellow, but Labillardiere, having deſcribed from his dried ſpecimens only, generally omits that particular. The *legume* is clothed with denſe, twiſted, yellowiſh hairs, which are very ſenſible hygrometers.

3. O. *cordifolium*. Heart-leaved Oxylobium. Andr. Repoſ. t. 492. Curt. Mag. t. 1544. Ait. n. 3.—Leaves ovate, ſomewhat heart-ſhaped, looſely hairy. Umbels terminal, ſeſſile, of few flowers. Diſcovered in New South Wales, by the right honourable ſir Joſeph Banks, in the courſe of his celebrated voyage. Seeds were imported by Mr. Loddige, who raiſed plants from them about 1804 or 1807. This ſhrub is kept in the greenhouſe, and bloſſoms throughout the ſummer, producing plenty of ſeeds, by which, or by cuttings, it is readily increaſed. It is of humble growth, with numerous, partly whorled, round, hairy, purpliſh, leafy *branches*. *Leaves* three in a whorl, rarely oppoſite or ſolitary, nearly ſeſſile, ſcarcely half an inch long, broad-ovate or ſomewhat heart-ſhaped, acute, revolute, entire; paler beneath; very rough at the edges, and hairy all over in ſome degree. *Flowers* of a rich deep orange, verging towards ſcarlet, from three to ſix in each cloſe terminal *umbel*. *Standard* marked with a yellow ſpot, and a deep red curved line, at its baſe. *Seeds* about five, black, clouded.

OXYMEL, οξυμελι, formed from οξυς, *four*, and μελι, *mel*, *honey*, in *Pharmacy*, a mixture of honey and vinegar boiled to the conſiſtence of a ſyrup.

Oxymel, *Simple*, is compoſed of two pounds of clarified honey, and a pint (lb.) of acetic acid (diſtilled vinegar), boiled in a glaſs veſſel by a gentle heat into the conſiſtence of a ſyrup.

Simple oxymel in doſes of f3j, or more, diſſolved in barley water, forms a pleaſant and cooling beverage in fevers and inflammatory affections. It is often added to gargles in cynanche tonſillaris, and is a common article of other remedies in catarrhal complaints. The Dublin college orders it to be prepared with unclarified honey, ſkimming it during the boiling; but the London directions are to be preferred.

Oxymel *Colchicum of Storck*. (See Colchicum.) It is obſervable, that the active matter of the colchicum is apt to be injured by the boiling; and hence this preparation is very uncertain, with regard to its ſtrength. It is given in humoral aſthmas, and in dropſies. The doſe is f3j, gradually increaſed, to f3j, given in a cupful of gruel, twice a-day.

Oxymel *Scillæ*, oxymel of ſquills, is prepared by boiling three pounds of clarified honey in two pints (pounds) of vinegar of ſquill in a glaſs veſſel, over a gentle fire, to a proper conſiſtence. This is principally employed as an expectorant, and as ſuch, is very uſeful in humoral aſthma, and chronic coughs, in doſes from f3ſs to f3ij. It is generally given in ſome aromatic diſtilled water, to prevent the naufea which it is apt to induce; in large doſes it is given to excite vomiting, and at the ſame time to clear the cheſt, in hooping-cough.

Oxymel *Æruginis*, oxymel of verdigris, conſiſts, according to the Dublin college, of the following ingredients, *viz.* prepared verdigris, one ounce; wine vinegar, ſeven fluid ounces; and clarified honey, fourteen ounces. Diſſolve the verdigris in the vinegar, and ſtrain it through a linen cloth; add the honey, and boil the mixture to a proper thickneſs. This preparation is detergent and eſcharotic. In the above ſtate it is uſed for taking down fungous fleſh; and conſiderably diluted, it is an uſeful ſtimulant to foul ulcers, which it clears, and excites to a more healthy action. It has been employed as a gargle in venereal ulcerations of the mouth and fauces; but, Mr. Thomſon ſays, we cannot recommend it.

OXYMORON, or *ſeeming contradiction*, in *Rhetoric*, is a ſpecies of antitheſis, when the parts of a ſentence diſagree in ſound, but are conſiſtent in ſenſe. Thus Ovid, lib. viii. ver. 47, ſays of Althea, *impietate pia eſt*.

OXYMURIATIC *Acid Gas*, French nomenclature; *Dephlogiſticated muriatic acid gas* of Scheele; *Chlorine*, or *Chloric gas*, of ſir H. Davy.

The ſubſtance which has received theſe various names was diſcovered in the year 1774, by the illuſtrious Scheele, and regarding it as muriatic acid deprived of hydrogen, he gave it the name of dephlogiſticated marine acid.

In the year 1785, Berthollet publiſhed a ſeries of experiments upon the ſame ſubject, from the reſults of which he drew inferences very oppoſite to thoſe of Scheele; for inſtead of regarding it with his predeceſſor as an elementary body, and as the baſis of muriatic acid, he was induced to conſider the muriatic acid as a ſimple form of matter, and to conclude that the dephlogiſticated muriatic acid gas of Scheele conſiſted of muriatic acid in combination with oxygen, whence the term oxymuriatic acid gas.

Berthollet's experiments appeared ſo ſatisfactory, and his reſults ſo concluſive, as to lead to the general adoption of his opinions by the chemiſts of Europe; but in the year 1810, ſir Humphrey Davy preſented the Royal Society with a paper, entitled "Reſearches on the Oxymuriatic Acid, its Nature and Combinations, &c." (ſee Phil. Tranſ. 1810, page 231.) in which, after quoting the opinions of the authors alluded to, and of other experimentaliſts, he details a ſeries

a ſeries of inveſtigations which demonſtrate the inaccuracy of Berthollet's views, and in a great meaſure re-eſtabliſh the correctneſs of thoſe of Scheele: theſe will be noticed in due order, and the reaſons ſtated which induced ſir H. Davy to give to the ſubject of this article the name of *Chlorine*.

Many objections have been ſtarted to this revival of the Scheelian doctrine by the advocates of the French ſchool, but they are hypothetical not experimental, and to meddle with ephemeral controverſialiſts is below the dignity of a Cyclopædia, which aims at the exalted taſk of recording the truths of ſcience, and of tranſmitting to poſterity the ſucceſsful inſtruments of its progreſs.

Chlorine may readily be procured by heating in a glaſs retort a mixture of equal weights of the black oxyd of manganeſe and common muriatic acid, (ſpirit of ſalt.) The gas is ſoon liberated, and may be conveniently collected over warm water. In this proceſs the oxygen of the oxyd of manganeſe unites to the hydrogen of the muriatic acid, while the chlorine, the other element of the muriatic acid, is diſengaged in the pure and gaſeous form. The correctneſs of this view may be demonſtrated by a more refined experiment. Introduce into a glaſs retort, ſupplied with a ſtop-cock, a ſmall quantity of black oxyd of manganeſe, exhauſt the retort by means of an air-pump, and fill it with pure muriatic acid gas. If a gentle heat be now applied, a decompoſition of the gas, and a partial decompoſition of the oxyd of manganeſe, will be effected; the hydrogen of the former, combining with a portion of the oxygen of the latter, produces water, which collects in drops in the cool part of the retort, and a quantity of chlorine, equal to one-half of the volume of muriatic acid decompoſed, is liberated. By ſuch decompoſition of the muriatic acid gas, the proportion of its elements may be accurately aſcertained. Thus, if the number 1 be employed to repreſent hydrogen, 33.5 will be the ſymbol for chlorine, and 34.5 (*i.e.* 1 + 33.5) for the muriatic acid, theſe numbers repreſenting the reſpective elements *by weight*. The ſynthetic demonſtration conſiſts in detonating, by the electric ſpark, one volume of chlorine with one of hydrogen; they combine without change of bulk, and two volumes of muriatic acid gas are produced.

Another mode of procuring chlorine conſiſts in diſtilling a mixture of about eight parts of decrepitated common ſalt, three parts of black oxyd of manganeſe, and five parts of ſulphuric acid diluted with half its weight of water. In this caſe the ſulphuric acid, which conſiſts of ſulphur, oxygen, and water, decompoſes the marine ſalt, conſiſting of ſodium and chlorine: the ſodium is oxydized at the expence of the water of the acid, the hydrogen of which unites to the chlorine of the ſalt, and produces muriatic acid, which is in its turn decompoſed by the oxyd of manganeſe as above deſcribed.

Although chlorine can only be conveniently collected in the hydro-pneumatic apparatus, yet as it is ſlowly abſorbed by water it cannot be retained in contact with that fluid, and ſhould therefore be preſerved in bottles with ground glaſs ſtoppers.

Chlorine has the following properties:

Its colour is, as its name imports, (from χλωρος) greeniſh-yellow.

It has a peculiar ſuffocating odour, and when reſpired is inſtantly fatal: even when largely diluted with atmoſpheric air it produces highly deleterious effects, ſuch as cough, catarrhal affection, and great irritation of the lungs. Theſe are circumſtances which render much caution neceſſary in collecting and examining the gas.

One hundred cubic inches of chlorine, at a mean temperature and preſſure, weigh 76 grains. At the temperature of 60° Fahrenheit, one volume of water diſſolves about two of chlorine: the ſolution has the odour and colour of the gas: its taſte is naufeous and aſtringent. By means of Wolfe's apparatus water may be conveniently ſaturated with this gas: the contents of the firſt bottle ſhould be rejected as containing a portion of muriatic acid, which paſſes over during the diſtillation.

When a burning wax taper is plunged into a bottle of chlorine, the brilliancy of its flame is greatly impaired; it exhibits a dull red light, and throws off a large quantity of charcoal.

The attraction of chlorine for the metals is in moſt inſtances extremely energetic: when copper leaf, or antimony, or arſenic in powder, are thrown into the gas, they immediately enter into vivid combuſtion and form binary compounds, and if the oxyds of theſe and many other metals be heated in chlorine, oxygen is expelled, and ſimilar compounds of the metal and chlorine reſult.

Upon the French theory of combuſtion, oxygen is abſolutely neceſſary to the phenomena (ſee COMBUSTION), but here are inſtances of brilliant inflammation without the preſence of that body. Other caſes might be adduced, ſuch as the combuſtion which enſues when copper filings and ſulphur are heated together in an exhauſted veſſel; or when potaſſium and arſenic are made to combine under ſimilar circumſtances.

Combuſtion, therefore, is to be regarded as the general reſult of the exertion of powerful chemical attraction, and not as dependent upon any peculiar ſubſtance, or as reſulting from the decompoſition of any diſtinct form of matter.

When ſulphur is heated in chlorine the two bodies readily combine, and form a peculiar compound, which was firſt deſcribed by Dr. Thomſon of Edinburgh. See SULPHUR.

When phoſphorus is introduced into chlorine, it ſpontaneouſly ignites and burns with a pale yelloviſh flame, producing a white volatile ſubſtance, compoſed of two proportions of chlorine and one of phoſphorus. There is alſo a compound of phoſphorus and chlorine compoſed of one proportion of each of its elements, and conſequently containing only half as much chlorine as the former. It may be obtained by diſtilling in a cloſe veſſel a mixture of corroſive ſublimate and phoſphorus. It is a limpid liquor, which emits acid fumes when expoſed to air. See PHOSPHORUS.

For our knowledge of theſe compounds, and of their ſingular properties, we are indebted to the experimental induſtry of ſir H. Davy.

Charcoal and chlorine have not hitherto been combined. If a piece of charcoal be ignited to whiteneſs by means of the Voltaic battery, in a veſſel of chlorine, there is no mutual action: the colour of the gas remains unimpaired, and the charcoal unaltered: no carbonic acid is formed.

This circumſtance firſt led ſir H. Davy to doubt the accuracy of Berthollet's inveſtigation, and to undertake the ſeries of inquiries concerning the nature and properties of chlorine, which have been alluded to. Chlorine, or oxy-muriatic acid gas of the French nomenclature, was ſuppoſed to contain oxygen in a very looſe ſtate of combination, an idea ſufficiently diſproved by the experiment juſt related; and whenever oxygen appears to be procured, it is derived either from water or ſome other ſource. Neither intenſe ignition, nor exceſſive cold, produce any change in chlorine. It has uſually been ſtated to ſolidify at the temperature of freezing water; but if the gas be carefully dried, no ſolid matter is depoſited. The concentrated aqueous ſolution freezes at 40°.

When no moiſture is preſent, chlorine effects no change upon vegetable colours; but if the gas has not been very carefully dried by expoſure to muriate of lime, or if the coloured

coloured ſubſtance introduced into it is the leaſt damp, it fades, and acquires a yellow tint, and almoſt all coloured ſolutions ſuffer the ſame change. This remarkable effect, which has generally been regarded as ariſing from the communication of oxygen to the colouring matter by the chlorine, ſeems to depend upon more intricate changes; it is perhaps connected with the production of muriatic acid and of oxygen, in conſequence of the action of chlorine upon water.

The uſes of chlorine in the art of *bleaching*, and the peculiar modes of its application, have already been deſcribed, (ſee BLEACHING.) Mr. Watt of Birmingham, and Mr. Henry of Mancheſter, are intitled to the merit of having firſt introduced this new method of bleaching into England. It originated with Berthollet.

In the year 1811, ſir H. Davy diſcovered a gaſeous compound of chlorine and oxygen; its colour is more intenſe than that of chlorine, a circumſtance which induced him to call it euchlorine, from ευ and χλωρος. To obtain this gas, ſome oxymuriate of potaſh ſhould be introduced into a very ſmall glaſs retort, and a mixture of equal parts of muriatic acid and water poured upon it. Twenty grains of the cryſtallized oxymuriate to half an ounce of the dilute acid, are good proportions. On the cautious application of a very gentle heat, the euchlorine paſſes over, and muſt be collected in the mercurio-pneumatic apparatus.

The ſmell of this gas differs from, and is much leſs diſagreeable than, that of chlorine. It is unreſpirable. Water takes up eight times its volume of euchlorine, and forms a lemon yellow ſolution. Its weight, compared with that of hydrogen, is as 33 to 1. One hundred cubic inches weigh 75 grains.

When euchlorine is heated to a temperature between 100° and 150° it expands with exploſion, and is reſolved into its conſtituent parts, *viz.* two volumes of chlorine and one of oxygen. It exerts no action upon thoſe metals which inflame in, and energetically combine with, chlorine. If copper leaf, for inſtance, be introduced into pure euchlorine, it is not even tarniſhed, but if heat be applied ſo as to decompoſe the gas, the metal is inſtantly ignited, and burns as in a mixture of two parts of chlorine and one of oxygen. Phoſphorus, an inflamed taper, and ſulphur in a ſtate of combuſtion, immediately decompoſe euchlorine, and exhibit the ſame phenomena as when burned in an artificial mixture of its elementary gaſes.

The above mentioned experiments and others, ſhew that euchlorine is compoſed of one proportion of oxygen = 7.5, and one of chlorine = 33.5, and conſequently its repreſentative ſymbol is 41.

In this article the term chlorine has been preferred to that of oxymuriatic acid, not merely on account of its brevity and propriety, but as founded upon an obvious and unalterable character of the body it repreſents, namely, its colour; and a change of nomenclature became abſolutely neceſſary to the ſyſtematic writer; for it would in him be abſurd to call a body *oxymuriatic acid*, which exhibits no acid characters, and in which neither oxygen nor muriatic acid have hitherto been demonſtrated to exiſt. B.

The editor of the Cyclopædia is fully apprized of the importance of giving accurate details of the origin and progreſs of every art and ſcience that are comprehended within the limits of the multifarious work in which he is engaged; and of doing ample juſtice to thoſe ingenious men, whoſe only recompence for valuable diſcoveries is, in moſt caſes, the reputation which they thus acquire. It is, therefore, without heſitation, that he complies with the wiſhes of a friend, no leſs reſpected and eſteemed for his eminent attainments in ſcience, than for his general character, by ſupplying the defects and correcting the errors which he has pointed out to him in the article BLEACHING. He much regrets that the name of Mr. Henry, of Mancheſter, whom he has long known and honoured, and the part which he took in the improvement of this branch of our manufactures, ſhould not have been noticed by the ingenious compiler of that article. Avoiding every thing that may be likely to produce perſonal animoſity and altercation, the editor thinks it moſt adviſable to content himſelf with giving a fair and full ſtatement of Mr. Henry's claims, and this ſhall be done as nearly as poſſible in the words of his correſpondent, Dr. W. Henry. He begins with alleging, that the writer of the article abovementioned, "in aſſigning to different perſons their ſhares of merit, in the introduction of the new mode of bleaching by oxymuriatic acid and its compounds, has made a diſtribution, which is very far from being fair or equitable." "Of the part," he ſays, "taken by Mr. Watt of Birmingham, in the application of this moſt important diſcovery, much too little is ſaid; and of my father's ſhare in the improvement, which was both an early, an active, and an expenſive one, not the ſmalleſt notice is taken throughout the whole article; though it was a matter of too much notoriety to have eſcaped the knowledge of any perſon in this neighbourhood." —"The fact is, that next to Mr. Watt, who had very early a perſonal communication with Mr. Berthollet on the ſubject, (ſee Annales de Chimie, ii. 160.), and who appears to have made the firſt experiments that were attempted in this country, my father was at leaſt equally early with any other perſon."—"It happens, fortunately for the eſtabliſhment of the claim of Mr. Watt and my father, that I am in poſſeſſion of a ſeries of letters from the former to the latter, communicating unreſervedly, in return for ſimilar information, what he was doing with a view to the practical application of Berthollet's diſcovery. In one of theſe letters (Feb. 23 1788) Mr. Watt ſtates, that at that very time 1500 yards of linen "were bleaching" by the new proceſs under his directions. In the ſame letter he alludes to "an advertiſement calling a meeting of the Mancheſter manufacturers and merchants to conſider of a petition preſented by certain foreigners —— to parliament, concerning a certain liquor made from native ſalt; which whitens linen, &c. in a ſhorter time, and without many inconveniences and loſſes, to which the old method was liable."

Dr. Henry further ſtates, that the piece of calico, ſaid, in the article of BLEACHING, to have been bleached by the new proceſs in the ſpring of 1788, was bleached immediately before the meeting to which Mr. Watt alludes in the fore-cited letter, and half a piece was produced at the meeting, in order to furniſh a reaſon for reſiſting the above-mentioned application of the foreigners. But, "there is every probability," ſays Dr. H., "that before this was done, the 1500 yards bleaching under Mr. Watt's inſtructions, muſt have been finiſhed; and that, conſequently, that diſtinguiſhed philoſopher had the priority to Meſſrs. Cooper, Baker, and Taylor. But, however this may be, my father, at the ſame public meeting where Mr. Cooper ſhewed his ſpecimen, produced, not half a piece, but half a yard, of calico, bleached by the oxymuriatic acid. What was wanting in quantity, however, was made up in the quality of the work; for the ſpecimen was declared to be ſuperior to Mr. Cooper's in whiteneſs; and its ſuperiority led to an acquaintance between my father and one of the bleachers preſent, who concurred in this opinion, and to the inſtruction of this gentleman (Mr. Ridgway of Harwich) by my father in the new mode of bleaching."

Mr. Cooper, it is ſaid, eſtabliſhed a large bleaching concern,

cern, which failed; and Mr. Henry's, on a ſmaller ſcale, was relinquiſhed in conſequence of the diſhonourable conduct of a partner.

The event of the town's meeting, already mentioned, was, "that in conſequence of the facts, which were ſtated on the authority of Mr. Watt, Mr. Cooper, and my father, inſtructions were given to the members of parliament for the county to oppoſe the petition; and it's prayer was accordingly refuſed." Afterwards, when application was made for a patent, Mr. Henry drew up a memorial, which was preſented to the attorney-general againſt the claim of the petitioners, and which contributed, at leaſt in a conſiderable degree, to their want of ſucceſs. This document, which is ſtill preſerved, places beyond all controverſy Mr. Henry's right to rank among the firſt improvers of the proceſs of bleaching.

It ought alſo to be mentioned that the firſt thing attempted by Mr. Henry was "an eſtabliſhment for preparing bleaching liquor, and ſelling it to conſumers. This liquor was prepared by receiving the oxymuriatic acid gas into a ſolution of cauſtic potaſh. It was ſoon found, however, that the liquor, though very good at firſt, loſt its power by keeping, in conſequence of the decompoſition of the acid, on a principle ſince explained by Mr. Chenevix, and the formation of hyper-oxymuriate and common muriate of potaſh. It was by diſappointment from this cauſe (an effete liquor having been ſent to Mr. Hoyle and others) that my father was influenced to take up the buſineſs of bleaching, in which he would probably have continued till this day, had it not been for the diſhonourable conduct of his partner."

After the preceding ſtatement, the editor thinks himſelf warranted, both in juſtice and honour, to recommend the following inſertions in the article of BLEACHING. At the cloſe of the 11th line of col. 2. p. 5. of that article, *viz.* before any conſiderable bleaching work was eſtabliſhed in France, let the following ſentence be introduced. "A very early and active ſhare was taken alſo in the introduction of the new mode of bleaching by Mr. Henry of Mancheſter and Mr. Watt of Birmingham. The latter gentleman, (who had been preſent at ſome experiments of Berthollet on the bleaching power of oxymuriatic acid,) in the month of February 1788 actually whitened 1500 yards of linen by this method. To his exertions, and to thoſe of Mr. Henry, who extended the ſcale of his operations from ſmall experiments to a regular eſtabliſhment for the purpoſe, and to the co-operation of the principal manufacturers of Mancheſter, it was owing, that ſome foreigners, who had brought with them into this country the knowledge of Berthollet's proceſs, were prevented from obtaining an excluſive and moſt injurious monopoly."

The editor alſo requeſts that the paragraph in line 27. p. 6 may be altered and read as follows: "One of the firſt of theſe ſucceſsful inſtitutions for alkali, invented by Mr. Henry of Mancheſter, and practiſed, under his inſtructions, by the bleachers of cotton hoſe at Nottingham, was," &c. &c. and let the paragraph terminate with the words "and enabled the perſons to let the goods down into the fluid."

OXYOPIA, from οξυς, *ſharp*, and οπις, *viſion*, in *Surgery*, a peculiar acuteneſs of ſight, ſometimes obſerved in fair perſons.

OXYPETALUM, in *Botany*, from οξυς, *ſharp*, and πεταλον, *a petal*, Brown in Tr. of the Wernerian Soc. v. 1 41. Claſs and order, *Pentandria Digynia*. Nat. Ord. *Contortæ*, Linn. *Apocyneæ*, Juſſ. *Aſclepiadeæ*, Brown.

Eſſ. Ch. Corolla with a ſhort inflated tube; the limb in five deep ſegments, each with a ligulate appendage above. Crown of the ſtamens of five roundiſh, ſimple, fleſhy leaves. Anthers tipped with a membrane. Maſſes of pollen linear, pendulous, attached to the curvature of the proceſſes, which are ſubſequently turned upwards. Stigma with an elongated, deeply divided point. Follicles . . . .

1. O. *fragrans*. The only ſpecies, diſcovered by ſir Joſeph Banks, in 1768, near Rio de Janiero. This is a twining *ſhrub*, with oppoſite heart-ſhaped *leaves*. *Umbels* between the *footſtalks*, ſomewhat corymboſe. *Flowers* ſweet-ſcented.

OXYPHLEGMASIA, from οξυς, and φλεγω, *to burn*, in *Surgery*, a very ſevere inflammation.

OXYPYCNI, οξυπυκνοι, in the ancient *Greek Muſic*, was a name given to ſuch chords as formed the higheſt ſounds of the ſpiſſa. There were five oxypycni in the ſcale. See PYCNI and SPISSUM.

OXYREGMIA, οξυρεγμια, formed from οξυς, and ερευγω, *ructo*, in *Medicine*, a ſourneſs of the ſtomach-liquor, occaſioning acid belches. See RUCTATION.

OXYRINCHITES, in *Ancient Geography*, a nome of Egypt, in Heptanomia, to the left of the Nile, on the borders of Libya.

OXYRINCHUS, a town of Egypt, the capital of the preceding nome, which took its name from a fiſh, called by the Greeks οξυρυγχος, oxyrynchus, which was an object of worſhip to the Egyptians, and which had a temple in this nome. This city became epiſcopal, and was much celebrated in the earlier ages of the church. Baillet ſays, that it contained 20,000 nuns and 10,000 monks, whence we may infer that the remaining population was very numerous, but this eſtabliſhment contributed, in proceſs of time, to the diminution of the inhabitants, and the decline of the place. Nothing remains of this city, in the village called Beneſech, built on its ruins, but ſome fragments of ſtone pillars, marble columns in the moſques, and a ſingle column left ſtanding, along with its capital, and parts of the entablature, which ſhew that it is the fragment of a portico of the Compoſite order. Thus, Oxyrinchus, once a metropolis, ſurrounded by a fertile plain, two leagues off the Libyan range of hills, has diſappeared beneath the ſand; and the new town has been obliged to retreat from this deſolating invaſion, leaving to its ravages houſe after houſe; and the inhabitants muſt at laſt be driven beyond the canal Juſef, on the border of which they will be ſtill menaced. Denon's Travels in Egypt, vol. i.

OXYRRHODON, OXYRRHODINUM, compoſed of οξυς, *ſour*, and ῥοδον, *roſe*, a mixture of two parts of oil of roſes, and one part of vinegar, ſtirred together for ſome time.

To theſe are ſometimes added diſtilled waters. It is uſed for inflammations, and to dry up tetters.

Scultetus preſcribes it as follows: two whites of eggs beaten, one ounce and a half of vinegar of roſes, four ounces of roſe-water, and two ounces of oil of roſes.

OXYRYNCHUS, in *Ichthyology*, a ſpecies of *Raja*, which ſee.

OXYS, in *Botany*, οξυς, *ſharp* or *acrid*, ſee OXALIS.

OXYSACCHARUM, οξυσακχαρον, compounded of οξυς, *ſour*, and σακχαρον, *ſugar*, a liquid medicine, compoſed of ſugar and vinegar.

The name is more peculiarly given to a ſyrup prepared with vinegar, the juice of four pomegranates and ſugar; uſed to cool, refreſh, and reſiſt the malignity of peccant humours.

OXYSAL DIAPHORETICUM, the name of a compound medicine greatly recommended by ſeveral authors, and invented by Angelus Sala. The manner of preparing it is this: take fine ſalt of carduus benedictus, put it into an earthen pot, and pour upon it gradually ſome ſtrong wine-vinegar,

vinegar, or ſpirit of ſugar; continue to pour this on till the ebullition ceaſes, and an agreeable ſmell ariſes, and the matter has an agreeable, though ſomewhat acid, taſte; let all the humidity from this mixture be evaporated over a gentle heat; and after this, let all the ſalt be again diſſolved in water, and ſet in digeſtion in balneo Mariæ for eight days: a liquor of a beautiful and pellucid colour is there produced, which, when poured carefully off into another veſſel, is to be again evaporated to a dryneſs with a very gentle heat, and the remaining matter, which is the ſalt, is to be collected together, and kept in a phial carefully ſtopt; for it is ſubject to run, if left to the acceſs of the air, like the common alkali ſalt.

OXYSTELMA, in *Botany*, ſo named by Mr. Brown, from οξυς, *ſharp*, and στελμα, the ſame as στεμμα, *a crown*; Brown in Tr. of the Wernerian Soc. v. 1. 40. Prodr. Nov. Holl. v. 1. 462. Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Contortæ*, Linn. *Apocyneæ*, Juſſ. *Aſclepiadeæ*, Brown.

Eſſ. Ch. Corolla wheel-ſhaped, ſpreading. Column prominent. Crown of the ſtamens of five compreſſed, acute, undivided leaves. Anthers tipped with a membrane. Maſſes of pollen compreſſed, attached by their taper points, pendulous. Stigma pointleſs. Follicles ſmooth. Seeds comoſe.

1. O. *eſculentum*. (Periploca eſculenta; Linn. Suppl. 168. Roxb. Coromand. v. 1. 13. t. 11. Willd. Sp. Pl. v. 1. 1250. Apocynum maderaſpatanum anguſtifolium ſcandens, flore amplo gemello verſicolore; Pluk. Amalth. 19. t. 159. f. 6, bad.)—Leaves linear-lanceolate. Segments of the corolla triangular.—Native of buſhy places, near rivers and pools, in Ceylon and Malabar. Koenig, who ſent fine ſpecimens to Linnæus, has written on one of them that "the plant is eſculent, and called *Uſepale* in the Tamul language." Dr. Roxburgh could not find that it was eaten by the people, at leaſt of the Malabar coaſt. He gives *Oudy-palla* as its name among the Telingas, and remarks that cattle eat it. The *root* is fibrous, and perennial as well as the twining, ſlender, ſmooth, round, branching *ſtems*. The *leaves* and *flowers* are produced during the rainy ſeaſon; the former are oppoſite, ſtalked, above two inches long, linear-lanceolate, acute, entire, ſmooth, ſingle-ribbed, light green, rounded at the baſe, deciduous. *Cluſters* long, lax, ſtalked, lateral, ſolitary, between the leaf-ſtalks at one ſide. *Flowers* the ſize of thoſe of *Primula Auricula*, of ſome of whoſe moſt beautiful varieties they give no very remote idea, but their ſegments are much more acute. Their colour is a pale bluſh, with crimſon veins, a purple eye, and a mixture of green and white in the centre.

2. O. *carnoſum*. Brown Prodr. Nov. Holl. v. 1. 462. —Leaves nearly oval, pointed. Segments of the corolla linear.—Native of the tropical part of New Holland, where it was obſerved by Mr. Brown. The *ſtems* are twining, herbaceous. *Leaves* fleſhy, ſmooth, oppoſite. *Flowers* in umbellate ſtalked cluſters, from between the leaf-ſtalks. Mr. Brown remarks that this New Holland ſpecies is ſo very different from the Eaſt Indian one, he is inclined to think they ought to be different genera.

OXYTOCHIA, formed of οξυς, *ſharp*, and τικτω, *I bring forth*, in *Medicine*, a term uſed by many authors to expreſs ſuch medicines as are given to promote delivery.

OYACACHA, in *Geography*, a town of South America, in the province of Quito; 25 miles E. of Quito.

OYAMBRE, Cape, a cape on the N. coaſt of Spain. N. lat. 43° 25′. W. long. 4° 17′.

OYAPOOK, a river of Guiana, which runs into the Atlantic, near cape Orange.

OYE, a town of France, in the department of the ſtraits of Calais, ſituated on a branch of the river Aa, to which it gives name, formerly in poſſeſſion of the Engliſh; ſeven miles E.N.E. of Calais.

Oye, *Norder* and *Sander*, two ſmall iſlands of Denmark, in the North ſea, two and three miles N. of Nordſtrand.

OYER, a town of Norway; 88 miles N. of Chriſtiania.

Oyer ſeems to have been anciently uſed for what we call *aſſizes*.

Oyer *and terminer*, a commiſſion directed to the judges and other gentlemen of the county to which it is iſſued, by virtue whereof they are empowered to hear and determine treaſons, and all manner of felonies and treſpaſſes. However, the judges or ſerjeants at law only are of the *quorum*, ſo that the reſt cannot act without the preſence of one of them. The term is French, and literally denotes to hear and determine. In our ſtatutes it is ſometimes written *oyer and determiner*. This is the firſt and largeſt of the five commiſſions by which our judges of aſſize do ſit, in their ſeveral circuits. (See Assizes.) The words of the commiſſion are "to inquire, hear, and determine;" ſo that by virtue of this commiſſion they can only proceed upon an indictment found at the ſame aſſizes, for they muſt firſt inquire, by means of the grand jury or inqueſt, before they are empowered to hear and determine by the help of the petit jury. Therefore they have another commiſſion of "gaol-delivery," which empowers them to try and deliver every priſoner, who ſhall be in the gaol when the judges arrive at the circuit town, whenever, or before whomſoever indicted, or for whatever crime committed. Thus, one way or other, the gaols are in general cleared, and all offenders tried, puniſhed, or delivered, twice in every year. Sometimes alſo, upon urgent occaſions, the king iſſues a ſpecial or extraordinary commiſſion of oyer and terminer, and gaol-delivery, confined to thoſe offences, which ſtand in need of immediate inquiry and puniſhment; upon which the courſe of proceeding is much the ſame, as upon general and ordinary commiſſions. Formerly it was held, in purſuance of the ſtatutes 8 Ric. II. c. 2. and 33 Henry VIII. c. 4. that no judge or other lawyer could act, in the commiſſion of oyer and terminer, or in that of gaol-delivery, within his own county, where he was born or inhabited; in like manner as they are prohibited from being judges of aſſize and determining civil cauſes. But that local partiality, which the jealouſy of our anceſtors was careful to prevent, being judged leſs likely to operate in the trial of crimes and miſdemeſnors, than in matters of property, and diſputes between party and party, it was thought proper by the ſtatute 12 Geo. II. c. 27. to allow any man to be a juſtice of oyer and terminer, and general gaol-delivery, within any county of England.

Anciently it was only in uſe upon ſome ſudden outrage, or inſurrection, in any place.

Oyer *de Record* is a petition made in court, praying that the judges, for better proof-ſake, will be pleaſed to hear, or look upon, any record.

In the like ſenſe, a perſon may demand *oyer* of a bond, deed, covenant, or the like.

O YES, a corruption of the French *oyez*, *hear ye*, being a term, or formula, wherein the criers in our courts enjoin ſilence or attention, before they make proclamation of any thing.

OYL Creek, in *Geography*, a river of Pennſylvania, which runs into the Allegany, N. lat. 41° 26′. W. long. 72° 43′.

OYON, a town of Spain, in the province of Alava; 22 miles S.S.E. of Vittoria.

OYONNEZ, a town of France, in the department of the Ain, and chief place of a canton, in the diſtrict of Nantua;

Nantua; ſeven miles N. of Nantua. The place contains 1178, and the canton 7278 inhabitants, on a territory of 207½ kiliometres, in 11 communes.

OYSTER, in *Natural Hiſtory*. See OSTREA.

Oyſters in their growth become faſtened to every ſolid ſubſtance which they happen to come into contact with; and rocks, ſmall ſtones, wood, ſea-plants, and a thouſand other things, are found at times with oyſters adhering to them, whoſe ſhells have fitted themſelves to the form of the thing itſelf, and loſt their natural ſhape. The people who fiſh for, and trade in oyſters, pretend to diſtinguiſh two kinds; one which is fecund, and will breed; the other, which is barren. They ſay, they diſtinguiſh theſe by a little black fringe, which always ſurrounds the good breeding oyſters.

The way to make oyſters green is, to put them into ſmall pits where the water is about three feet deep, in the ſalt marſhes, and where the ſun has great power; in theſe they become green in three or four days.

The oyſter affords the curious in microſcopic obſervations a very pleaſing entertainment. In the clear liquor many little round living animalcules have been found, whoſe bodies being conjoined, form ſpherical figures, with tails not changing their place otherwiſe than by ſinking to the bottom, as being heavier than the fluid; theſe have been ſeen frequently ſeparating, and then coming together again. In other oyſters, animalcules of the ſame kind were found, not conjoined, but ſwimming by one another, whence they ſeemed in a more perfect ſtate, and were judged by Mr. Leewenhoeck to be the animalcules in the roe or ſemen of the oyſter.

A female oyſter being opened, incredible multitudes of ſmall embryo oyſters were ſeen, covered with little ſhells, perfectly tranſparent, and ſwimming along ſlowly in the liquor; and in another female the young ones were found of a browner colour, and without any appearance of life or motion.

Monſieur Joblot alſo kept the water running from oyſters three days, and it appeared full of young oyſters ſwimming about nimbly in it; theſe increaſed in ſize daily, but a mixture of wine, or the vapour of vinegar, killed them.

In the month of Auguſt oyſters are ſuppoſed to breed, becauſe young ones are then found in them. Mr. Leewenhoeck, on the fourth of Auguſt, opened an oyſter, and took out of it a prodigious number of minute oyſters, all alive, and ſwimming nimbly about in the liquor, by means of certain exceeding ſmall organs, extending a little way beyond their ſhells; and theſe he calls their beards. In theſe little oyſters he could diſcover the joinings of the ſhells, and perceived that there were ſome dead ones, with their ſhells gaping. Theſe, though ſo extremely minute, are ſeen to be like the large oyſters in form.

As to the ſize of them, he computes, that a hundred and twenty of them in a row would extend an inch; and, conſequently, that a globular body, whoſe diameter is an inch, would, if they were alſo round, be equal to a million ſeven hundred and twenty-eight thouſand of them. He likewiſe found animalcules in the liquor five hundred times leſs than the embryo oyſters. Leewenhoeck, Arcan. Nat. tom. iv. p. 513.

It is not very uncommon to ſee on oyſter-ſhells, when in a dark place, a ſhining matter or blueiſh light, like a flame of brimſtone, which ſticks to the fingers when touched, and continues ſhining and giving light for a conſiderable time, though without any ſenſible heat. This ſhining matter being examined with a microſcope, was found to conſiſt of three different ſorts of animalcules. Phil. Tranſ. N° 279. See OYSTER-*worm*, infra.

From another account, preſerved in Sprat's Hiſtory of the Royal Society, from p. 307 to 309, we learn that the oyſters caſt their ſpawn, which the dredgers call their ſpat, in the month of May; this ſpat cleaves to ſtones, old oyſter-ſhells, pieces of wood, &c. at the bottom of the ſea, which they call cultch; and it is conjectured, that the ſpat in twenty-four hours begins to have a ſhell. In the month of May, the dredgers, by the law of the admiralty court, have liberty to take every kind of oyſter, whatſoever be their ſize. When they have taken them, they gently raiſe with a knife the ſmall brood from the cultch, and then they throw the cultch in again, to preſerve the ground for the future, unleſs they be ſo newly ſpat, that they cannot be ſafely ſevered from the cultch: in this caſe they are permitted to take the ſtone or ſhell, &c. which the ſpat is upon, one ſhell having often twenty ſpats. After the month of May, it is felony to carry away the cultch, and puniſhable to take any other oyſters, except thoſe of the ſize of a half-crown piece; or ſuch as, when the two ſhells are ſhut, will admit of a ſhilling to rattle between them. This brood, and other oyſters, are carried to creeks of the ſea, and thrown into the channel, which are called their beds or layers, where they grow and fatten; and in two or three years the ſmalleſt brood will become oyſters of the foreſaid ſize. There are great penalties, impoſed by the admiralty court, upon thoſe that fiſh out of the grounds which the court appoints, or that deſtroy the cultch, or that take any oyſters that are not of the proper ſize, or that do not deſtroy a fiſh, which they call the five-finger, the common ſea-ſtar, becauſe that fiſh gets into the oyſters when they gape, and ſucks them out. The reaſon of the penalty for deſtroying the cultch is, that they find when this is taken away, the ouſe will increaſe, and the muſcles and cockles will breed there, and deſtroy the oyſters, becauſe they have no convenience for depoſiting their ſpat. The oyſters are ſick after they have ſpat; but in June and July they begin to mend, and in Auguſt they are perfectly well: the male oyſter is black-ſick, having a black ſubſtance in the fin; and the female white-ſick, as they term it, having a milky ſubſtance in the fin. Oyſters are ſalt in the pits, ſalter in the layers, and ſalter at ſea. It is obſerved, that when the tide comes in, they lie with their hollow ſhell downwards, and when it goes out, they turn on the other ſide; they do not remove from their places, except in cold weather to cover themſelves in the ouſe.

OYSTER *Fiſhery*. See FISHERY.

OYSTERS, *Foſſile*. The greateſt bed of foſſile oyſters any where known is that near Reading, in Berkſhire. They have the entire ſhape, figure, and are of the ſame ſubſtance with the recent oyſter-ſhells, and yet muſt have lain there for a long time, the oldeſt hiſtories that mention the place giving an account of them. They are extended over no ſmaller a ſpace than ſix acres of ground, and juſt above them there is a large ſtratum of a greeniſh loam, called by ſome writers a green earth, and by others a green ſand. It is compoſed of a crumbly marle, and a very large portion of ſand. Under them there is a thick ſtratum of chalk. They all lie in a level bed, and the ſtrata above the ſhells are natural, and have never been dug through till the time of finding the ſhells.

The oyſter-ſhells and green earth together make a ſtratum of about two feet thick; and over this a much thicker ſtratum, of a blueiſh and very brittle clay; but this has never been dug through, except where we find the ſhells. The people call this *piercy-clay*, and ſay it is fit for no uſe. This bed of clay is about a yard deep, and above it is a ſtratum of fuller's earth, about two feet and a half deep; it is of a very good kind, and is uſed by the clothiers. Over this there lies a ſtratum of a fine white ſand unmixed either with

the clay or fuller's earth: this is near ſeven feet deep, and above this there is a ſtratum of a ſtiff red clay, of which they make tiles in the place. This is covered with a little vegetable mould, and the depth of this ſtratum of tile-clay cannot be aſcertained, becauſe of the unevenneſs of the hill.

Theſe oyſters are ſometimes found whole, but more uſually in ſingle ſhells. When they are in pairs, there is uſually ſome of the green ſand found within them: they ſeldom ſtick very faſt together; ſo that unleſs very carefully taken up, it is not eaſy to get them in pairs. Phil. Tranſ. N 261. p. 484.

Oyster-*Shells*. Theſe are an alkali of a more powerful kind than is commonly ſuppoſed, and probably are in reality much better medicines than many of the more coſtly and pompous alkalis of the ſame claſs. The proof of alkalis is in their ſolution by acid ſpirits; and Mr. Homberg found, that they diſſolved much more eaſily in the acids of nitre and ſea-ſalt than pearls, coral, and the reſt; which he ſuppoſes owing to their containing in the body of the ſhell a conſiderable portion of ſal-ſalſus, which is eaſily perceived upon the tongue, and which keeps the whole ſubſtance of the ſhell in a ſort of half-diſſolved ſtate. Theſe ſhells are found to produce very great effects on the ſtomach, when injured by acid humours; and Mr. Homberg is of opinion that this their eaſineſs of ſolution is one great reaſon of their good effects, and that the quantity of ſal-ſalſus which they contain, contributes not a little towards it, ſince we are not to look upon that as a mere ſalt, but a ſalt of a peculiar kind, formed of ſea-ſalt by the organs of the animal, and the ſeveral fermentations it undergoes in the body of it, in the ſame manner as the nitrous and other ſalts of the earth ceaſe to be nitrous, &c. as ſoon as they have been blended with the juices of plants, and form with them a ſalt peculiar to that plant; and this is plainly the caſe in regard to this ſalt, ſince it is evidently of a more penetrating taſte, and of a different ſmell, from the ſalt left by the ſea-water between the ſeveral external ſcales, or flakes of the ſhell.

As oyſter-ſhells were found by Mr. Homberg to be a very valuable medicine, and as one of the common methods of preparing them is by calcination, which he obſerves cannot but much impair their virtues, he gives the following method of preparing them for taking inwardly, which was what he always uſed.

Take the hollow ſhells of the oyſters, throwing away the flat ones as not ſo good; waſh them perfectly clean, and then lay them to dry in the ſun: when they appear dry, beat them to pieces in a marble mortar, they will be then found to contain yet a large quantity of moiſture; lay them again in the ſun till perfectly dried, and then finiſh the powdering them, and ſift the powder through a fine ſieve. Give twenty or thirty grains of this powder every morning, and continue it three weeks or a month. Mem. Acad. Par. 1700.

For the method of calcining oyſter-ſhells, and thus preparing a phoſphorus, ſee *Canton's* Phosphorus.

Oyster-*Worm*, in *Natural Hiſtory*, a name given by writers to a kind of ſmall worm found in oyſters, which ſhines in the dark, in the manner of the glow-worm; but with an univerſal light, and not in a peculiar part only.

The firſt obſerver of theſe oyſter-worms was M. De Lavoye, who communicating his obſervations to M. Auzout, gave occaſion to a very diſtinct account of them from this author.

The firſt thing that preſents itſelf, on the opening of the oyſters which contain theſe worms, is only a ſort of ſhining clammy moiſture, which appears like a ſtar of a blueiſh colour, and, being drawn out, will extend itſelf to near half an inch long, and ſhine as much for that whole length as in the contracted ſtate: it will alſo ſhine for ſome time after it is taken out of the oyſter.

On a ſtricter obſervation, theſe ſhining ſubſtances are found to be real living worms, and there are indeed three diſtinct ſpecies of them. One ſort is whitiſh, and has twenty-four or twenty-five feet on each ſide: there is a black ſpeck on one ſide the head, and the back exactly reſembles that of an eel, when the ſkin is ſtripped off. The black ſpeck in the head is certainly an eye; and it is remarkable that the creature has but one. The ſecond ſort of theſe worms is red: this alſo has but one eye; its body is made up of ſeveral rings; its noſe is like that of a dog, and it has the ſame number of feet with the former. The third ſort is very different from the other two: it is ſpeckled, and its head is like that of a foal, and has a tuft of hair on each ſide. There are other worms found alſo in the oyſter, particularly a large greyiſh one, with two horns, a great head, and ſeven or eight whitiſh feet; but theſe do not ſhine. This light occurs more frequently in large than in ſmall oyſters; there are few of theſe large ones that do not yield it in the ſhells, and in ſome it is ſeen in the oyſters themſelves. Journal de Sçavans, 1666.

Oyster *Bay*, in *Geography*, a townſhip of New York, ſituated in Queen's county, Long Iſland, extending from the ſound ſouth to the Atlantic ocean, and including Lloyd's Neck or Queen's village and Hog iſland. It contains 4548 inhabitants, of whom 134 are ſlaves.

Oyster *Bay*, a harbour for ſmall veſſels, in the ſouth-weſt limits of Barnſtable, Maſſachuſetts. It derives its name from its excellent oyſters.

Oyster *Creek*, a river of North Carolina, which runs into the Atlantic, N. lat. 34° 50′. W. long. 76° 45′.—Alſo, a river of New Jerſey, which runs into the Atlantic, N. lat. 39° 44′. W. long. 74° 20′.

Oyster *Harbour*, a bay on the ſouth-weſt coaſt of New Holland, and north part of King George the Third's Sound, diſcovered by captain Vancouver in the year 1791, and ſo called from its plenty of oyſters. It is rendered admiſſible only for veſſels of a middle ſize, by the ſhallowneſs of the water on the bar, extending from ſhore to ſhore, on which were found only 17 feet of water, although the depth increaſed from five to ſeven fathoms on each ſide. The deep water within this harbour did not ſeem to be of any great extent. In both theſe harbours the communication with the country is rendered unpleaſant, by the ſhallow depth of water extending to a great diſtance from the ſhore. If it ſhould be thought an object of importance, this inconvenience might be eaſily remedied by wharfs. S. lat. 36 58′. E. long. 118° 15′.

Oyster *Haven*, one of the numerous bays on the ſouth-weſt coaſt of Ireland, in the county of Cork. The entrance is about two miles eaſtward of Kinſale harbour. It is ſeldom frequented, being too near the much ſuperior harbours of Cork and Kinſale; but there is good ſhelter for ſmall veſſels. M'Kenzie.

Oyster *Iſland*, an iſland in the bay of Bengal, near the coaſt of Aracan. N. lat. 20° 13′. E. long. 92° 43′.—Alſo, a ſmall iſland in the bay of Sligo, Ireland, between which and the land is the only place in the harbour where a veſſel can ride afloat at all hours of the tide. This is diſtinguiſhed by the name of Oyſter iſland harbour, and has well-ſheltered anchorage. M'Kenzie.

Oyster *Iſland Harbour*, a bay or harbour on the Atlantic, on the coaſt of Maſſachuſetts. N. lat. 41° 35′. W. long. 70° 24′.

Oyster *River*, a ſandy bay, within the ſouth head of Mercury bay, in New Zealand.

Oyster *River*, a branch of the Piſcataqua, in New Hampſhire.

OYSTERMOUTH, a ſea-port and pariſh in the cwmwd of Gwyr, cantref of Eginoy (now called the hundred of Swanſea,) and county of Glamorgan, South Wales, is ſituated on a ſmall promontory, which forms the weſtern boundary of Swanſea bay, in the Briſtol channel. The eaſtern extremity of the pariſh is called "The Mumble Point," oppoſite to which, at a ſhort diſtance from the ſhore, a light-houſe has been lately erected. This place might be made an excellent ſtation for ſhipping at a very trifling expence, either by walling in the ſounds between the Mumble Head and the ſhore, or by running a pier out under the caſt point of Mumble Hill. Veſſels bound for Falmouth with coals from Swanſea generally lie here when waiting for wind and convoy; frequently to the number of one hundred and fifty ſail at one time. Along the ſhore hence to Swanſea, a railway has been conſtructed, by which coals and manure are brought down, and lime returned from the limeſtone quarries, which are ſituated cloſe to the village of the Mumbles, and where ſeveral lime-kilns are eſtabliſhed. In digging the ſtone of theſe quarries many human bones of large dimenſions have been diſcovered; and tradition ſays, this ſpot was formerly the ſcite of a chapel, but no veſtiges of it now remain. The exiſtence of ſuch a building, however, is not improbable, as the ſea has made great encroachments on this part of the bay. A large wood, called "Crow's Wood," frequently mentioned in ancient records, has been ſubmerged, and traces of it are ſtill evident in the ſand at low water. Vaſt quantities of ſhell-fiſh, but particularly oyſters, are caught or dragged on the coaſt here: hence the origin of the term Oyſtermouth as the deſignation of the pariſh, which, according to the parliamentary returns of 1811, contains 200 houſes and 761 inhabitants.

On a knoll or eminence eaſt from the church ſtand the ruins of Oyſtermouth caſtle, ſuppoſed to have been erected by the Norman Beaumonts, who conquered Gowerland. It has ſuffered leſs from the ravages of time than any ruin in this part of the country, the principal walls being as yet in good condition, and moſt of the apartments entire. The general figure is polygonal, and the ramparts are conſpicuouſly lofty, but there are no flanking towers except on each ſide of the entrance gateway. Here, according to tradition, the chancery court for the ſeignory of Gower was anciently held. This edifice is now the property of the duke of Beaufort, as lord of the ſeignory, and is much reſorted to by parties of pleaſure from Swanſea and the neighbourhood. In one of the dungeons of the caſtle is a circular ſtone pillar, into which almoſt every viſitor ſticks a pin, conformably to an old cuſtom, practiſed from time immemorial. The whole ruin is covered with a profuſion of ivy.

Weſtward from Oyſtermouth is the pariſh of Pen-Arth, part of which is conjectured to have been anciently the ſcite of a conſiderable town, as many foundations of houſes are dug up among the ſands, and there is ſtill a village to the ſouth of them, called "South-gate," and alſo a farm houſe to the north, called "Norton" or "North-Town." Here are alſo very extenſive remains of a caſtle ſituated near the mouth of a ſmall rivulet, which divides the pariſh of Pen-Arth from that of Pen-Maen. The gateway is almoſt entire, and is a very fine ſpecimen of ancient architecture. Between this fortreſs and the ſea, on the ſands, is a rock, called "The Three Cliffs," from its reſemblance to three ſugar loaves placed in a line. In the centre of this rock is a curiouſly formed arch, ſuppoſed to have been excavated by the ſea; and not far from hence is a ſingular cavern in the cliff, called "Bacon's Hole." This cavern is ſituated nearly midway between the water and the ſummit of the rock, and is inacceſſible from below in any ſtate of the tide, but there is a narrow and very ſteep path leading down to it from above, by which, though the attempt is fraught with the utmoſt danger, many perſons deſcend. Carliſle's Topographical Dictionary of Wales, 1 vol. 4to. 1811.

OZÆNA, in *Surgery*, from ὄζω, *a fetid ſmell*, uſually ſignifies a fetid ulcer, when ſituated within the cavity of the noſe, and frequently accompanied with caries.

This diſeaſe, in the early ſtate, is ſometimes attended with many of the common ſymptoms of a catarrh. As Mr. Pearſon remarks, a trifling ſwelling and redneſs take place about the ala naſi, accompanied with a diſcharge of mucus. The air is tranſmitted through the affected noſtril with difficulty, eſpecially during ſleep; and, in the morning, the orifice is often quite obſtructed by mucus. As the diſeaſe advances, the diſcharge aſſumes more of a purulent appearance, and it is moſt abundant in the morning. Sneezing and ſlight hemorrhages occaſionally happen. The ulceration often extends outwardly, ſpreading round the ala naſi over the cheek; but it hardly ever deſtroys the ala naſi, or ſpreads far from the noſe.

This diſeaſe is deſcribed by Mr. Pearſon as being frequently connected with ſcrofula and venereal complaints; and he ſtates, that in the latter caſe, more frequently than in the former, carious portions of the oſſa ſpongioſa come away. Many venereal patients, whoſe complaints have been properly treated, ſometimes complain of a diſcharge of fetid matter from the noſtrils, and of troubleſome incruſtations within the cavities, for a conſiderable time after the perfect cure of their original diſeaſe. According to the preceding writer, theſe ſymptoms generally indicate the preſence of carious bone; and when that has exfoliated, the complaints will ceaſe.

The ozæna frequently occurs as a ſymptom of cachexia ſyphiloidea. It will perforate the ſeptum naſi, deſtroy the oſſa ſpongioſa, and ſometimes render the oſſa naſi completely carious. The depreſſion of the noſe, from the loſs of the oſſa naſi, is, according to Mr. Pearſon, more frequently the effect of the cachexia ſyphiloidea, at the preſent day, than of lues venerea.

As abſceſſes of the antrum are attended with ſome ſymptoms, which reſemble thoſe of the ozæna, the ſurgeon muſt be upon his guard againſt miſtaking one diſeaſe for the other.

When the ozæna is altogether a local diſeaſe, as it muſt be regarded, when entirely kept up by the preſence of a dead portion of bone, that has not yet exfoliated, conſtitutional remedies appear to be unneceſſary. The dead bone will in time be caſt off, and the ſore ſpontaneouſly heal. But, in every inſtance, the utmoſt care muſt be taken to keep the part affected as clean as poſſible; and, with this view, alum and zinc injections are proper.

When ozæna, however, is dependent upon a ſcrofulous affection of the conſtitution, upon lues venerea, or what is termed the cachexia ſyphiloidea, the particular remedies for theſe particular ſtates of the ſyſtem muſt be given, ere the ulcer can be cured.

The principal internal medicines, employed for the cure of the ozæna, are,

1. Preparations of mercury, or antimony.

2. Sarſaparilla, elm-bark, Peruvian bark, muriate of barytes, muriate of lime.

3. Sea-bathing.

The beſt topical applications are,

Preparations of copper, zinc, arſenic, mercury, pulvis ſternutatorius, mercurial fumigations, diluted ſulphuric acid, &c. See Pearſon's Principles of Surgery, edit. 2. p. 285, 286.

OZAMA, in *Geography*, one of the largeſt rivers of Hiſpaniola, on which St. Domingo is ſituated near its diſcharge into the ſea. It is navigable nine or ten leagues from ſouth to north. At the mouth there is a rock, which prevents the entrance of veſſels that draw more than 18 or 20 feet of water. The road before the mouth is very indifferent, and lies expoſed from W.S.W. to E. It is impoſſible to anchor in it in the time of the ſouth winds, and the north winds drive the veſſels from their moorings into the ſea, which here runs very high. The mouth of the river is in N. lat. 18° 18′, and W. long. 72° 38′ from Paris.

OZANAM, James, in *Biography*, an eminent French mathematician, who flouriſhed in the 17th and 18th centuries, was deſcended from a family of Jewiſh extraction, but which had long ſince profeſſed the Chriſtian faith, and ſome of the branches of it had held different offices in the parliament of Provence. He was born in the year 1740, and being intended for the church, his courſe of education was adapted to his future profeſſion. He became, however, enamoured with mathematical ſtudies, and ſo ſucceſsful was he in this purſuit, that, at the age of fifteen, he wrote a ſort of mathematical treatiſe, which was never printed, but contained many things which he thought proper to inſert in the works that he afterwards publiſhed. On the death of his father, he devoted himſelf entirely to the ſciences, and ſoon afterwards went to Lyons, where he commenced mathematical tutor for his ſupport, obtained many pupils, and a conſiderable ſhare of reputation. Here he acquired a paſſion for gaming, but was, upon the repreſentation of a good friend, perſuaded to go to Paris, where he extricated himſelf from the habit which he had formed at Lyons, and became highly reſpected for his manners, his various talents, and learning. For ſeveral years he derived a conſiderable income, from teaching the mathematics at Paris. In 1701 he had the misfortune to loſe his wife, with whom he had lived moſt happily many years, and by whom he had twelve children. This circumſtance, added to ſome others that were very diſtreſſing, reduced him to a ſtate of melancholy, from which he was in a good meaſure recovered by the honour of being admitted, in the ſame year, an *élève* of the Royal Academy of Sciences. He died in 1717, at the age of 77. M. Ozanam was uſually diſtinguiſhed by a mild and calm diſpoſition, a chearful temper, which manifeſted itſelf under many heavy and very accumulated diſtreſſes. He was ſincerely pious and devout, but ſtudiouſly avoided all theological controverſy, and was accuſtomed to ſay, when urged on that topic, "that it was the buſineſs of the Sorbonne to diſcuſs, of the pope to decide, and of the mathematician to go to heaven in a right line." He publiſhed a great number of uſeful books, chiefly introductory to the ſciences; among which were "A Courſe of Mathematics, comprehending all the moſt uſeful and neceſſary Branches of this Science," in 5 vols.; "A Treatiſe on Fortification, containing the ancient and modern Methods of the Conſtruction and Defence of Places," 4to.; "Mathematical and Philoſophical Recreations, containing numerous, uſeful, and pleaſing Problems in Arithmetic, Geometry, Optics," in 2 vols. 8vo.

OZAR, in *Geography*, a town of Perſia, in the province of Segeſtan; 62 leagues S.E. of Zareng.

Ozar, a town of Italy, in the principality of Piedmont; 10 miles S. of Turin.

OZE, a word uſed by ſome writers to expreſs a fœtor, or ill ſmell of the mouth.

OZEMAN, in *Geography*, a town of Aſiatic Turkey, in the province of Natolia, between Amaſieh and Toeat.

OZENE, in *Ancient Geography*, a name given in the Periplus of the Erythrean ſea, as well as in Ptolemy, to the city now called *Ougein*; which ſee.

OZERNAIA, in *Geography*, the name of two fortreſſes of Ruſſia, in the government of Upha, on the Ural; one 40 miles W. of Orenburg, and the other 64 miles E. of it.

OZERNOVSKOI, a cape of Ruſſia, on the eaſtern coaſt of Kamſchatka; 32 miles N.E. of Ukinſkoi.

OZIGINA, an oſtrog of Ruſſia, on the Indigirda; 144 miles N.N.E. of Zaſhiverſk. N. lat. 69 30′. E. long. 142° 22′.

OZINO, a town of Japan, in the iſland of Niphon; 25 miles N. of Meaco.

OZINOVSKOI, a town of Ruſſia, in the government of Perm, on the Kama; 16 miles N.N.E. of Oſa.

OZMA, a town of Bulgaria, on a river of the ſame name; 21 miles S. of Nicopoli.

OZOHOWK, a town of Poland, in Volhynia; 14 miles S.S.E. of Kreminick.

OZOLAVA, one of the larger Navigator's iſlands, in the South Paciſic ocean; the inhabitants of which greatly reſemble thoſe of Maouna. S. lat. 14°. W. long. 171 25′.

OZOPHYLLUM, in *Botany*, a genus of Schreber's, the name of which is derived from ὀζω, *to ſlink*, and φυλλον, *a leaf*, in alluſion to the unpleaſant ſcent of its foliage when bruiſed. Schreb. 452. Willd. Sp. Pl. v. 3. 585. Mart. Mill. Dict. v. 3. (Ticorea; Aubl. Guian. v. 2. 689. Cavan. Diſſ. 6. 362. Juſſ. Gen. 264.)—Claſs and order, *Monadelphia Pentandria*. Nat. Ord. *Meliæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, very ſmall, five-toothed, acute. *Cor.* Petals five, their long claws united into the form of a tube; their limbs oblong, obtuſe, ſpreading. *Stam.* Filament cylindrical, ſheathing the ſtyle, five-toothed at the apex; anthers five, oblong, erect. *Piſt.* Germen ſuperior, five-lobed, ſurrounded by a gland; ſtyle thread-ſhaped, longer than the petals; ſtigma capitate. *Peric.* five-celled. *Seeds* unknown.

Eſſ. Ch. Calyx five-toothed. Corolla funnel-ſhaped, of five petals. Style one. Capſule? five-celled.

1. O. *fœtidum*. Mart. Mill. Dict. (O. trifoliatum; Willd. Ticorea fœtida; Aubl. Guian. t. 277. Cavan. Diſſ. t. 206.)—This ſolitary ſpecies of *Ozophyllum* is a native of the foreſts of Guiana, where it flowers in February. *Stem* ſhrubby, about ten or twelve feet in height, much branched, covered with a ſmooth, green bark. *Leaves* alternate, digitate, on long ſtalks; leaflets three, the central one larger, all ſmooth, ſoft, oval, ſharp-pointed. *Flowers* terminal, corymboſe, white.

Willdenow has changed the ſpecific name to *trifoliatum*, but ſince the whole plant, when bruiſed, emits a ſtrong diſagreeable ſmell, like that of *Stramonium*, we are induced to retain the original one of Aublet, notwithſtanding Schreber's generic name is expreſſive of its fœtid qualities. The wood of this ſhrub is deſcribed as white, tender, and fragile.

OZUNICZE, in *Geography*, a town of Lithuania, in the palatinate of Wilna; 30 miles E.S.E. of Breſlaw.

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Strahan and Preſton,
New-Street Square, London.